The University of Minnesota

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SWAMP LAND DRAINAGE WITH SPECIAL REFERENCE TO MINNESOTA

BY

BEN PALMER, M.A., LL.B.
Assistant in Political Science in the University of Minnesota

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PREFACE

Nearly all of this paper was prepared at the University of Minnesota in the seminar in Political Science; and the writer gratefully acknowledges his indebtedness to the members of that department, Professors W. A. Schaper, J. S. Young, and C. D. Allin. He is also under obligations to Professor J. T. Stewart, of the College of Agriculture, for many helpful suggestions and criticisms; to Professor E. M. Morgan, of the Law School, and to Mr. Arnold V. Johnston, graduate student in Political Science.

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BEN PALMER

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SWAMP LAND DRAINAGE WITH SPECIAL REFERENCE TO MINNESOTA

CHAPTER I

INTRODUCTION

It has been estimated that there are in the United States to-day approximately 80,000,000 acres of swamp and overflowed lands,[1] an area of unproductive land greater than the Philippine Islands and nearly three times as large as Great Britain and Ireland. When we consider that these wet lands are so vast in extent, that they are unproductive and an economic waste, and that they are in many states so productive of malarial diseases as to constitute a serious and ever-present menace to the lives and health of the people, the importance of the problem of land drainage in the United States is apparent. If—using the suggestion of Chief Hydrographer Leighton, of the United States Geological Survey—this land were suddenly acquired as an outlying possession, there is no doubt that there would be a great movement for its exploitation. Or, "if there lay off our coast such a wondrously fertile country inhabited by a pestilent and marauding people who every year invaded our shores and killed and carried away thousands of our citizens, and each time shook their fists beneath our noses and cheerfully promised to come again, how the country would go to arms, the treasury be thrown open, and how quickly that people would be subjugated!" And yet that is just the situation which our swamp lands, with their great possibilities for development as additional territory for our people and with their cost to the United States in lives lost annually by malarial fevers, present to us.

The benefits to be derived from land drainage are many. The removal of surplus waters results in (1) a greater certainty of a full crop on agricultural lands, because of a reduction in the damaging effect of frost on vegetation; (2) an increase in the yield per acre, with a corresponding permanent increase in the market value of the land; (3) improvement of public highways; (4) benefits to transportation companies because of the increase in freight tonnage due to the raising of more agricultural products;

[1] 60 Congress, 1 session, *Senate Document 443*. All statements as to swamp areas should be read with the caution that estimates vary according to differing opinions as to what constitutes swamp.

(5) benefits to towns near drained districts because of increased business; (6) benefits to railroad companies due to decrease in cost of maintaining trackage, as result of lessening of damages caused by floods and by softening of roadbeds; (7) improvement in public health, due to the elimination of fever and disease breeding swamps and marshes.

Even those lands which, at the present time, are used to some extent for farming, although somewhat wet because of the proximity of swamps and completely inundated areas, will be benefited by the drainage of the swamps, and their productiveness increased. For drainage ventilates the soil and helps to give to plants the abundance of free oxygen which they need. It increases the available supply of soil moisture for the crops, since roots on well-drained land will pierce deeper and be better able to draw on ground waters during drought than roots in less well-drained soils. And, finally, because of the fact that the low temperature of well-drained land does not last long in the spring, seeds may be planted early in the season. [2]

Using an average estimate, although conditions vary greatly according to the engineering problems presented and are affected by topography, we may place the cost of making public drains at approximately four dollars an acre, and, in addition, private drains required to place the land in productive condition at eight dollars an acre, and the cost of subduing and reducing cultivation at five dollars an acre. A fair estimate of the value of such reclaimed lands would be thirty-seven dollars an acre, so that a net profit from drainage work of twenty dollars an acre might reasonably be expected; or a net increase in the market value of the 80,000,000 acres of swamp land in the United States of $1,600,000,000.[3] This reclaimed area could furnish farms for hundreds of thousands of people,[4] and help to take the place of the free homestead lands of the West. Since the improvement is a permanent one, it would increase the value of the agricultural products raised in the United States by millions of dollars per year.

The decrease in malarial diseases as a result of the drainage of swamp lands is well known. It has been demonstrated both abroad and in the Panama canal zone, as well as in the United States itself.

Malarial diseases prevailed in Indiana and Illinois to an alarming extent

[2] F. H. King, *Irrigation and Land Drainage*, 418-429.

[3] 60 Congress, 1 session, *Senate Document 443*, 6. United States Department of Agriculture, *Circular 76*, 10, places the value of drained land at from twenty to sixty dollars, and at four hundred dollars, if it is near cities. Van Hise, *Conservation of Natural Resources*, 3. E. E. Watts, "Drainage Improvement by Dredging," in *Engineering News*. 47:139-140 (1902). Governor A. O. Eberhart, of Minnesota, in an address delivered June 26, 1910, estimated an added value of ten dollars an acre at a cost of only one dollar. J. J. Hill in *Highways of Progress*, 104, estimates an increase in value from two to three times the present value.

[4] Van Hise, in his *Conservation of Natural Resources*, 4, estimates that the reclaimed swamp lands of the United States could support an additional population of 50 million, basing his estimate on the experience of Holland.

prior to the construction of extensive drainage systems in those states. During the period from 1870 to 1890 the number of deaths from malaria in Iowa, Indiana, and Illinois decreased from 52.5 per thousand of the total to 8.6 per thousand, and that was the time of greater drainage activity in those states, so that it is reasonable to conclude that these changes in malarial conditions were due to swamp land reclamation.[5] From the census of 1870 it appears that the deaths from malaria in the lowlands of the Mississippi River from Cairo to the Gulf during the preceding year were 89.8 per thousand of the total. In the census of 1900 we find that for the same territory the deaths from this disease were 88.8 per thousand. Likewise for the southeast coast lands of South Carolina, Georgia, and Florida, the deaths from malaria in 1870 were 66.2 per thousand and in the same territory they were 61.7 per thousand in 1890. In other words, in both these regions there was practically no decrease in the percentage of deaths from malaria during the very period when there was practically no swamp land reclamation being carried on in them. And drainage operations near the city of Charleston, South Carolina, tend further to demonstrate the remarkably beneficial effect of such work upon the health of the people. The white residents of James Island, opposite the city, were formerly obliged to leave the island during the summer months on account of the prevalence of malaria. But they can now safely remain there the whole year round, since no difficulties of this kind whatever have been experienced subsequent to the general introduction of drainage upon the farm lands of the surrounding country.[6] If the only result of the unwatering of the overflowed lands of the United States were an improvement in public health by the substantial reduction of the losses due to malarial diseases, and the other benefits from reclamation were entirely disregarded, the work would still be worth the doing; for it has been estimated that the economic losses due to malaria in this country are not less than $100,000,000 per annum.[7]

The reclamation of these swamp lands will include three distinct operations: (1) The construction of ditches, or the improvement of natural drainage channels, such as will be required by a large number of landowners in common, and will necessitate the use of the power of the state and of legal procedure; (2) detailed drainage on individual farms at private expense and the use of tile or open drains; (3) the subjugation of wild vegetation, the removal of stones and stumps, and the preparation of the soil for cultivation. This discussion will be confined to a consideration of the first of these three operations; that is, it will treat only of the public aspect of swamp land reclamation.

[5] See 60 Congress, 1 session, *Senate Document 443*, 5.
[6] *Ibid.*; L. O. Howard, in National Conservation Commission, *Report*, 3:756.
[7] Howard, L. O., *Reports of National Conservation Congress*, 3:756.

CHAPTER II

DRAINAGE WORK IN COUNTRIES OTHER THAN THE UNITED STATES.

A study of the part that has been played by the governments of other countries in the reclamation of swamp and overflowed areas within their borders, and of the general features of their drainage laws, and an attempt to gain some idea as to the amount of wet lands made fit for cultivation by other nations, may help to throw some light on the question, "How progressive have been the drainage methods followed by the states of the American Union?" Of course, economic and topographical conditions vary so greatly in different countries and even in different parts of the same land that no sweeping statements can be made as to the comparative efficiency of the drainage operations carried on in different countries. It would not be strange, however, if a young nation, which is just beginning to need its swamp lands to support a rapidly increasing population, could learn something of value from older countries that have been considering ways of solving the drainage problem, and building ditches and dykes for many years, in some cases, indeed, for several centuries.

In no other country in the world does the problem of land drainage occupy more of the attention of the government and of the people of the state than in Holland, the "Hollow Land." For over six centuries it has been waging a relentless warfare against the waters of the rivers and the sea, its weapons being dykes and ditches. A large part of the country which is now occupied by hundreds of cities and villages and by many thousands of people, was originally submerged, and even to-day between two fifths and one half of the land is below the level of the sea.

In early times, when the Netherlands were sparsely inhabited by uncivilized tribes, the country was a vast morass periodically inundated by the waters of the North Sea. A few years after the territory had been subjugated by Julius Caesar, Pliny wrote of the land as follows: "There the ocean pours in its flood twice a day, and produces a perpetual uncertainty whether the country may be considered as part of the continent or of the sea. The wretched inhabitants take refuge on the sandhills, or in little huts which they construct on the summits of lofty stakes whose elevation is conformable to that of the highest tides. They subsist on the flesh of fish left by the refluent waters, and which they preserve with great care; their fuel, a sort of tuft which they gather and form with the hand." So

Eumenius wrote during the third century: "There was not, in the whole of the immense plain, a spot of ground that did not yield under the footsteps of man;" and Caesar in his Commentaries on the Gallic Wars described the land as being so marshy and level that the rivers had no visible currents. Taine, the French historian of the middle nineteenth century, wrote that "in Holland the soil is but a sediment of mud; here and there only does the earth cover it with a crust of mire, shallow and brittle, the mere alluvium of the river, which the river seems ready to destroy."[1]

The drainage problem with which the Hollanders have had to deal has always been of a twofold character: the waters of the sea must be repelled from the land, and the "inner waters," due to lack of natural drainage and seepage through the porous soil, must be expelled. Along the southern part of the coast sand dunes have formed a natural barrier against the sea, but in the provinces along the northern coast and the islands in Zeeland in south Holland, it was necessary to build great dykes to keep out the sea. After this was accomplished, barriers had to be erected along the lower courses of the rivers in order to keep them from flooding the adjacent low lands at seasons of high tide, or in stormy weather when the waters are driven back up from the sea. After the Dutch had shut out the ocean and rivers by means of dykes, lands were gradually reclaimed by the process of impolding, which consisted in encircling a tract of land with a dyke and then pumping out the water. It was under this system that the great Lake of Haarlem was unwatered. This inland sea had been increasing in size for centuries. In 1531 it covered 6,000 acres, and by 1830 it had an area of 40,000 acres. In 1848 the work of impolding was begun, and by 1852 it had been completed at a cost of $3,893,200. This gigantic enterprise resulted in the reclamation of 41,675 acres of land, which sold for $120.84 per acre. In addition to Haarlem Meer over thirty-eight square miles of territory have been added to the northern provinces since 1877 by enclosing small tracts of shallow shore land at a time.

All this work has been carried on by the government itself. It is reimbursed by charges on the land reclaimed. The dykes and polders are maintained by waterschaps or boards which are responsible to the respective provincial governors and also to a super council which has charge of the main waterways and interprovincial jurisdiction. As a general rule, the cost of maintenance is borne by the different districts, but some of the dykes are of so great a size and of so much importance to the safety of

[1] Of the Netherlands in their natural state, Motley wrote: "It was by nature a wide morass, in which oozy islands and savage forests were interspersed among lagoons and shallows; a district lying partly below the level of the ocean at its higher tides, subject to constant overflow from the rivers and to frequent and terrible inundations by the sea. Here, within a half-submerged territory, a race of wretched ithyophagi dwelt upon terpen or mounds which they had raised, like beavers, above the almost fluid soil." *Rise of the Dutch Republic*, 1:10, 11.

the whole country that they are placed directly under the control of the central government, which makes special appropriations to keep them in repair.

For the last fifty years the hydraulic engineers of Holland, as well as the people in general, have been dreaming of reclaiming the Zuyder Zee. This is eleven times the size of Haarlem Lake, and it comprises more than one sixteenth of the total area of the kingdom. In 1886 an association was formed for the express purpose of forcing the government to take some action as to the matter, and in 1892, as a result of this agitation, the government appointed a committee of twenty-nine to investigate the practicability of draining the Zee. The majority of the commission in 1894 reported in favor of the project. It will cost about $76,000,000 and occupy thirty-three years. It is estimated that the reclaimed land will have to be sold by the government at not less than $154 an acre in order to reimburse the state for the expense of the work. This does not seem an unreasonable price, however, since agricultural lands in Friesland, Zeeland, and North Holland are now worth per acre $215, $219, and $300, respectively.[2] The reclaimed land will be sold to peasant purchasers under an amortization scheme calling for forty-five annual payments. The estimated benefits from the project are placed at $500,000,000, and the unwatered area will support 200,000 inhabitants.[3]

Drainage operations in France are carried on by two different agencies: (1) the government, (2) associations of landowners. The government undertakes a drainage work only when it is of too vast an extent to be completed successfully by groups of private landowners, or when the owners of such lands refuse to do a piece of reclamation work which the government considers necessary for the general welfare. When the central government does the work, it assumes one third of the cost itself, and apportions one sixth to the department and one half to the owners of the land.

The chief steps in the procedure where the government itself conducts the drainage operations are as follows:

1. The state designates the lands which it deems advisable to drain, and submits the proposition to the landowners.

2. The latter meet and decide whether they wish to undertake the work themselves.

[2] Land that is cultivable sells at remarkably high prices in Holland. South of Haarlem bulb land rents for from sixty to eighty dollars an acre and sells for from $1,600 to $1.800. The raw land reclaimed by the Y polders, when the North Sea canal was opened, sold at auction as high as $540. E. D. McQ. Gray, *Government Reclamation Work in Foreign Countries*, 25.

[3] Gray, *Government Reclamation Work in Foreign Countries;* J. J. Hill, "Our Wealth in Swamp and Desert," in *World's Work*, 19:12595-12617 (1910); Guy E. Mitchell in *World Today*, 13:727 (1907); S. Tatum, "Reclamation and Drainage in the South," in *Annals of the American Academy of Political and Social Science*, 35:77 (1910); Missouri Bureau of Labor Statistics, *Supplementary Report*, 1910, *Draining Missouri Low Lands*, 7-10.

3. If the owners refuse to carry out the proposed drainage, then the government decides whether it will do the work itself, or grant it to a concessionary.

4. The state engineers draw up the plans (or approve the plans of other parties if the work has been granted to them) and exercise general engineering supervision over the construction work.

5. The president appoints a special commission to have charge of the whole project, and a board of appraisal is created to make assessments and determine damages. The prefect of the department, the minister of public works, and a syndicate representing the landowners, each appoint one member of this appraisal board, the findings of which must be approved by the departmental legislative assembly. Appeals from assessments may be taken to the presidential commission which has charge of the work.

The most important drainage undertakings that have been accomplished by the government under this law embraced 1,640,000 acres of land. In 1879 the Forez project, including 140,000 acres, was completed, and in 1865 that of LesLandes and LaGironde, comprising 1,500,000 acres of swamp. What were formerly fever-stricken, sandy marshes are now agricultural and forest lands. The average life of the inhabitants of these regions has been lengthened by more than four years, and the lands have increased in value from fifteen dollars an acre to over fifty dollars. In 1879 there were over 1,365 miles of main canal in LesLandes and La Gironde. Half of this reclaimed area belongs to towns which paid their assessments for the cost of the work by selling 466,000 out of the 720,000 acres of the drained land which they owned, so that no state funds were used. The prefects of the various departments in which the lands are located supervise the maintenance of these governmental works, but the cost of such maintenance is borne by the landowners.

The second agency by means of which lands have been drained in France is the association of landowners. There are two kinds of associations which may carry on drainage operations: (1) those organized by mutual consent of all concerned, (2) those whose organization is controlled by a majority of the owners. Members of the first class may construct drains through the lands of their number, but they do not have the privileges of quasi-public associations. In the associations of the second class proceedings are instituted by means of a petition presented to the prefect of the department, and then, if two thirds of the owners of the land in the proposed district, who pay three fourths of the taxes, or three fourths of the owners who pay two thirds of the taxes, vote at a public meeting in favor of forming a drainage association, the petition is submitted to the minister of public works. If the latter, on the advice of a local improvement committee and of the department commissioner of agri-

culture, decides that the proposed work will be of public utility, the prefect calls a meeting of the landowners of the district. These elect officers, a representative assembly to make rules and apportion assessments and damages, and a board of trustees to supervise the construction and maintenance of the work. These associations have the power of eminent domain, and may be granted loans by the central government from a fund of $20,000,000 which was appropriated in 1856 to aid irrigation and drainage works. These loans are payable in twenty-five yearly installments, are collected in the same way as general taxes, and are a lien upon the land. This landowners association law was enacted in 1865, and amended in 1894. Under it over fifty associations have been organized to drain more than 700,000 acres. Before 1865 several thousand acres of swamp land had been reclaimed under a law much like that of 1865, and these associations still exist for the maintenance of the ditches which they have constructed.[4]

There have been three great drainage acts in England. In 1846 Parliament passed the Public Moneys Drainage Act, the purpose of which was to facilitate drainage works by advances of money to a limited amount on the security of the land to be improved. Twenty-two-year loans were made to landowners on application to the inclosure commissioners. Although the sum of £2,000,000 for Great Britain, and £1,000,000 for Ireland was set aside by the act for advances, yet the fund was soon exhausted, and in 1849 the second great drainage act was passed. This, the Private Moneys Drainage Act, authorized landowners, with the sanction of the inclosure commissioners, to borrow or advance money to be expended in land drainage. Various improvement and drainage companies were organized to take advantage of the provisions of the law. After 1849, however, the government gave no direct aid to drainage projects. The third important drainage law was the act of 1861 which applied only to England. This statute authorized the formation of elective drainage districts under the supervision of the inclosure commissioners, and provided that the cost of the work should be charged against the land rentals and payable in installments to run for periods not to exceed thirty years.

The principal steps in the procedure, which is strikingly similar in its main features to that in many of our states, are as follows:

1. A petition signed by the proprietors of not less than one tenth of the proposed district is presented to the inclosure commissioners. This petition must describe the lands which it is proposed to drain, and be accompanied by a guaranty on the part of the petitioners of the payment of all preliminary expenses.

[4] George Wilson, in Institute of American Engineers, *Minutes of Proceedings*, 1879, vol. 55: 234-240; 60 Congress, 1 session, *Senate Document 443*, 12-14; Gray, *Government Reclamation Work in Foreign Countries*, 12-14.

2. The inclosure commissioners send an inspector to examine the lands to be affected by the proposed project, and to examine the same and report thereon.

3. If the inspector's report is favorable, the commissioners may issue a provisional order. This order when confirmed by Parliament establishes the drainage district.

4. The construction of the work is supervised by a drainage board elected by the property owners of the district.

It has been estimated that one fifth of the most fertile lands of Great Britain and Ireland have been drained.[5]

In Austria government aid is given to drainage enterprises (as to other reclamation projects), both by the province in which the land affected is located, acting through the provincial legislature, and by the imperial government, acting through the minister of agriculture. Whenever a district, commune, or water association desires aid, it petitions the provincial legislature to that effect and, if the petition is favorably received, a legislative committee decides which of two alternative plans of financing the work shall be adopted: (1) either the parties directly interested may be assessed to an amount not exceeding thirty per cent of the estimated cost of the enterprise, and the balance made up from the provincial budget and by an appropriation by the minister of agriculture from the reclamation fund (such appropriation not to exceed thirty per cent of the cost of the work), or (2) the provincial government may contribute not to exceed twenty per cent of the total cost, or else loan money for carrying on the work. The general object of both of these financial schemes is to divide the expense of draining lands equally among the imperial government, the provincial government, and the parties directly interested. (When these last are represented by a district or commune, the government grants are usually nonpayable and amount to direct appropriations rather than loans.) Construction is done by public contract; maintenance, by water associations formed for that purpose.[6]

Drainage operations in Prussia have been carried on in three ways: (1) by private drainage associations, (2) by public drainage associations, (3) by the government itself.

The private drainage associations are the agencies especially employed in reclaiming small tracts of swamp land. They are merely a kind of partnership and are entirely free from government control.

Public drainage associations are incorporated with the approval of the minister of agriculture and of the provincial or communal authorities, for

[5] Guy E. Mitchell in *Review of Reviews*, 37:433, cites Professor Shaler as authority for estimate; Gray, *Government Reclamation Work in Foreign Countries*, 47-49.

[6] *Ibid.*, 5, 6.

the purpose of reclaiming extensive tracts of land when the owners are not unanimously in favor of the work. Before the association can be incorporated it must be proved of public utility and beneficial to agriculture, and approved by a majority of the landowners whose lands are affected. In those provinces where there is a considerable amount of swamp land, there are imperial commissions which advise the minister of agriculture, make plans for proposed work, and aid associations in complying with the requirements of the drainage laws. The chief steps in the procedure involved in the work of public drainage associations are: (1) presentment to the minister of agriculture of a petition, (2) its approval and reference to the Prussian Diet for an act of incorporation,[7] (3) the preparation of detailed plans and issuance of orders for removal of dams or appropriation of necessary private property, (4) the levy of assessments in proportion to benefits. Damages are determined by a board consisting of one member each appointed by the claimant for damages and a landowner desiring the work, and a third member. Appeals may be taken to the courts. The assessments for benefits are collected like regular taxes and the association may borrow money secured by first mortgages on the land.

In 1906 there were 1,400 drainage associations in Prussia, and 700 so-called "dyke associations" operating over an area of 756,139 and 39,953,670 acres respectively (total, 40,709,809 acres). The most striking example of reclamation work in northern Germany was the completion of the diking and maintaining of the Memel Delta, between the Ross and Gilge rivers, which for centuries had been periodically overflowed. Although it was first attempted to drain part of this area as early as the first quarter of the seventeenth century, the year 1901 had been reached before 65,700 acres had been reclaimed.[8]

The private and public drainage associations confine their operations to the reclamation of lands which are principally owned by private individuals, so that the work which the government has done has been almost entirely concerned with the drainage of morass and fens, which are usually crown lands. These government operations are not carried on under any general laws but the Diet makes special enactments to cover each separate undertaking. There is a central morass commission which superintends the projects undertaken by the state and conducts an experiment station for investigating the best methods of swamp land drainage. As early as 1868 the government began to make loans for drainage purposes to tenants of the crown lands.[9] In 1890 it began to drain morass and fens itself and from 1892 to 1901 appropriated 1,722,000 marks ($408,000) to carry on the work. It has been the policy of the government to colonize

[7] Afterward the association is under the supervision of the town or provincial authorities.
[8] One of the associations involved in the work has had a continuous existence since 1613.
[9] Which have averaged 400,000 marks annually.

these reclaimed areas and to reimburse itself for the costs of drainage by selling or renting the lands reclaimed.[10]

Drainage works in Italy are of two classes: (1) those wholly or chiefly for sanitary purposes, (2) those wholly or principally for agricultural purposes. The works of the first class are under the complete control of the central government, but it may delegate to the provincial or communal governments or to interested landowners the authority to construct the drainage works required. The state pays six tenths of the total cost of these sanitary projects, the province one tenth, the commune one tenth, and private landowners two tenths, the latter being assessed in proportion to benefits received by them. Even if a province or commune is actually outside of the drainage district, it will be required to contribute to the cost of the work if it can be shown that it will be benefited therefrom in any way. The communes levy a special tax to pay their share of costs, and these assessments constitute a lien on the lands of those assessed. Damages are awarded to persons whose property is taken, by a court representing the minister of public works, the landowners, and the judiciary; and appeals may be taken from this court of arbitration to the ordinary courts of law.

Non-sanitary works, or those of the second category, may be constructed by associations of landowners acting under the provincial prefect, or by individuals. Voluntary associations may be formed by mutual consent of all landowners concerned. Compulsory associations may be organized either on the initiative of the government or of interested landowners. If the government commences the proceedings, then the individuals interested pay only seven tenths of the cost; the remainder of the burden is borne by the national government, province, and commune in equal portions. But if the owners of swamp land initiate the proceedings, they must pay all the costs. Both compulsory and voluntary associations have the power to levy taxes in proportion to benefits, to borrow money, and to take private property required in carrying out drainage work.

Some idea as to present and prospective reclamation work in Italy may be gained from the fact that between 1900 and 1924, $36,544,800 will have been spent for works of the first class (that is chiefly sanitation, especially the Pontine marshes),[11] and $12,285,000 for work of the second class undertaken by associations.[12]

[10] Authorities on Prussia: Gray, *Government Reclamation Work in Foreign Countries,* 15-19; 60 Congress, 1 session, *Senate Document 443,* 14-16; *Scientific American,* 102:165 (1910).

At the present time Prussia is engaged in the reclamation of 16,000 acres of the Friedburg peat bogs in East Friesland. Not only are the lands being reclaimed, but the peat is being used to create electric current, and for other commercial uses. *Scientific American,* 102:165 (1910).

[11] The government, provinces, and communes will contribute $29,700,000 to the cost of this work.

[12] 60 Congress, 1 session, *Senate Document 443,* 16-18; Gray, *Government Reclamation Work in Foreign Countries,* 19-24.

For more than fifty years systematized efforts have been made in Belgium to reclaim the marshes of limited area located east of the Sambre and the Meuse. These swamps seldom cover more than 250 acres each, but they have seriously affected the health of the inhabitants of the surrounding country. Nearly all the drainage work that has been done so far has been accomplished by associations (wateringues) either individual or communal, acting under the supervision of the minister of public works or of agriculture. As a general rule the state has paid about one half of the cost of the work. The largest marshes reclaimed up to the present time do not comprise more than 250 acres each in area, and are found chiefly in the province of Luxembourg. This land has doubled and frequently trebled in value.[13]

In European Russia reclamation work is carried on at government expense only on the crown lands. Technical assistance furnished to private landowners must be paid for at a regular rate, but in case of associations of peasants this charge is remitted. As to non-crown lands either private landowners or interested communities must take the initiative; and, if the government provides any engineers, they must be given entire control of the work. The chief drainage works so far completed by the government have been devoted to reclaiming swamps in the northern and west-central provinces.[14]

In Denmark the Rigsdag usually makes a yearly appropriation for drainage work, the money to be loaned under the direction of the department of agriculture. If the petition for a loan is granted, the debt must be amortized in forty-two years. The individual landowners desiring public aid must petition the governor of the province stating in detail their financial condition, and giving a description of the land to be drained. In 1906 the state loaned about $10,720 to aid in the reclamation of swamp lands.[15]

Until recently, the government of Greece has not participated in land reclamation beyond granting concessions on certain conditions to individuals and associations formed for the drainage of swamp lands as business enterprises. There is no general drainage law, a special act being passed to cover the agreements with the different companies.

The only work of any importance that has been accomplished thus far has been the draining of Lake Copias. This lake in Boeotia was surrounded by swamp; the total area of the marsh and lake was more than 600,000 acres. Ruins of an extensive canal dating from the heroic age, and probably the work of the Minyoy of Orchomenos, tend to show that a part of the swamp was drained and cultivated in ancient times. No at-

[13] 60 Congress, 1 session, *Senate Document 443*, 16; Gray, *Government Reclamation Work in Foreign Countries*, 8-10.

[14] *Ibid.*, 34-38.

[15] *Ibid.*, 102-103.

tempt, however, was made to drain the lake after the classical era until 1880, when a French company secured a concession. The ditches required to reclaim the land were built after six years of work, and the lake was then emptied in forty-nine days. By 1894, 17,500 acres of reclaimed land were in cultivation. The contract with the drainage company provides that at the end of ninety-nine years two thirds of the total area reclaimed shall revert to the state (estimated at 40,000 acres), and one third continue to be the property of the company.[16]

Although most of the shallow lakes, sloughs, and peat bogs of Norway are in private hands, yet the Storthing makes annual appropriations for their drainage. Up to 1910, $5,000 a year has been appropriated. These contributions, however, have thus far been inadequate to result in the reclamation of very much land. Persons seeking government aid apply to the inspectors of their respective departments, who draw up plans and specifications and estimates as to the probable cost of the work, and may report in favor of the project to the agricultural department. Thereupon the government contributes one fourth of the cost of the work as a free gift. The construction of the ditches is under the control of the government. Some state lands have been drained as a result of special appropriations by the Storthing on the recommendation of the department of agriculture. No statistics as to the total area of reclaimed land in Norway are available, but in a district called the Jaderen near Stavanger about 6,000 acres have been drained.[17]

Private landowners in Sweden may engage the government engineers to carry on drainage work at the expense of such owners, or they may receive direct monetary aid from the government, provided their applications for such assistance are approved by the direction of highways and waterways and the ministry of agriculture. Such grants may amount to the total cost of the work, but they must be repaid in installments and, until they have been fully amortized, the works constructed remain in the control of the government engineers. Nothing is available to throw any light upon the question as to how much work has actually been accomplished in Sweden further than the fact that in 1907 the government appropriated 500,000 kroner ($134,000) to be loaned for a long period of years to landowners in Norland for drainage purposes.[18]

In Algeria the government and private syndicates began drainage operations over fifty years ago. They have completed three great projects: (1) the unwatering of the valley of the Gardens of Mortaganem at a cost of $26,000, (2) the drainage of Lake Halloula, which had been in winter a sheet of water covering 5,000 acres and in summer a malaria-breeding

[16] *Ibid.*, 103-105.
[17] *Ibid.*, 106-107.
[18] *Ibid.*, 108-109.

swamp, (3) the reclamation of the plain of Mitidga, just south of Algiers. This is now one of the richest agricultural regions in Algeria, but before its reclamation it was a marsh so pestilential as to be known as "the grave of the Europeans." [19]

In Australia the government of Victoria has expended national funds through its department of public works. These funds were used to drain crown morass lands covering over 74,000 acres, the state being repaid from the sale of the drained land at enhanced prices, and benefited by the increased settlement of the reclaimed areas. No work had been undertaken up to 1910, either by municipalities or by any private associations under concessions, but all drainage operations of any considerable magnitude had been undertaken directly by the state. In New South Wales an act of 1906 provided for loans from the state treasury for draining malarial swamp lands. Owing to continuous wet weather and lack of surveyors only 10,000 acres had been reclaimed up to 1910, although applications had been made under the act for aid in draining nearly 170,000 acres.[20]

In South America as far as can be learned no government action has been taken in regard to land drainage, and practically no swamp lands have been reclaimed.[21]

One of the most interesting and important drainage undertakings that has been accomplished in any country of the world has been carried on in Mexico. The valley of Mexico occupies an area of approximately 2,700 square miles. It is more or less elliptical in configuration and is surrounded on all sides by mountains and extinct volcanoes, some of which rise to a height of over 11,000 feet above the level of the sea. In the range of mountains to the north there is a sharp depression, and ever since the sixteenth century the inhabitants of the valley have discussed the problem of draining off through this depression the waters collected in the low-lying land around the city of Mexico.

As early as 1607 the first important attempt was made to drain the valley, when one Enrico Martinez cut a tunnel through the mountains at Nochistongo for four and one-tenth miles. Although this tunnel was about thirteen feet square, it was finished in the incredibly short period of eleven months. The wonderful speed with which the work was accomplished was due in part to the soft character of the soil, and to the fact that the Spanish government pressed thousands of Indians into service and employed them in several shifts so that there were practically no interruptions in the construction of the tunnel. Owing to the great haste with which the work was done no masonry was put in the tunnel. Consequently it collapsed with the first torrential rain, and from 1629 to 1634 the City of

[19] *Ibid.*, 47-48.
[20] *Ibid.*, 87-90.
[21] *Ibid.*, 108-115.

Mexico was almost continually flooded. It is estimated that at this time over thirty thousand people perished in one month. As a result of this disastrous flooding of the valley of the Spanish government ordered that the City of Mexico be moved to a position higher up in the valley. But owners of city property, estimated to have been worth over $50,000,000, did not wish to abandon their land, for they believed that the valley could be drained satisfactorily at a cost of $3,125,000. In 1637 it was decided to change the tunnel into an open ditch about 197 feet in depth, but it was not until over a century and a half had passed by that the work was completed (1789). Over $3,900,000 was spent on the project, and it cost the lives of countless Indians; but when the work was finished it was discovered that the ditch was of very little use since its bottom was nearly thirty feet higher than the level of Lake Texcoco. The War of Independence and various revolutions prevented any further consideration of the drainage problem in Mexico until 1856. In that year a government commission decided upon a plan to carry off the surplus waters of the valley through a ditch connecting several lakes. But actual construction was prevented by the Civil War and the French occupation. In 1866 the Emperor Maximilian inaugurated a period of active work which lasted until 1867, when the empire fell. Civil wars from 1868 to 1881 rendered drainage operations intermittent, but in 1885 the government appropriated $415,000 a year to be used by a new commission, and the City of Mexico borrowed $12,000,000 to aid in the work. Operations had formerly been conducted directly by the government, but they were now turned over to contracting companies. The construction of a canal twenty-nine and a half miles long was commenced by the contractors in January, 1890, and completed in June, 1896. About 10,000,000 cubic yards of earth were excavated by dredges and 6,000,000 by hand labor. The canal now carries the sewage of the City of Mexico out of the valley; protects the city from inundation by controlling the level of the near-by lakes; and prevents the accumulation of water in those shallow lakes and marshes which had for centuries been a fever-breeding menace to the inhabitants of the valley.[22]

From the foregoing discussion it appears that European countries, with the probable exception of Russia, have not been backward in the work of swamp land reclamation through public action. A considerable amount of marsh and overflowed soil has been made fit for cultivation; and the practicability and wisdom of such work have been demonstrated from an engi-

[22] John B. Body, in article published by the Institute of Civil Engineers in the *Engineering Record*, 44:131-134 (1910). Mr. Body was engineer in charge of the work during 1892 and 1893. His article is practically the only discussion on the subject, except for a few brief references in magazine articles. Mr. Gray in his *Government Reclamation Work in Foreign Countries*, 105, states that it has not been feasible, even with the help of the American consular service, to obtain particulars concerning the drainage of the valley of Mexico (1910).

neering or sanitary standpoint, as well as shown to be a profitable business investment. A comparison between the method of instituting and conducting ditching operations in lands other than the United States, and that followed in this country, as described in the following chapters, reveals a few important differences. Most of these are to be explained by the fact that greater constitutional limitations exist in America, and a different theory of government and its proper sphere prevails here, from that recognized abroad. The national government here has taken no part in drainage work, nor have the states except in a few instances, participated directly therein further than to enact general drainage statutes permitting the coöperation of landowners; while it is common for the central authority in foreign lands to aid such work by loans or by the direct appropriation of funds. Furthermore, while it is true that in France, Belgium, Italy, Austria, and Prussia associations of landowners may unite in the construction and maintenance of public ditches, state work and influence are very great. The complete control of operations by interested private individuals throughout the proceedings, and the inauguration of work on their initiative rather than on that of the government, which is the characteristic feature of the American scheme of swamp land reclamation, is noticeably absent.

CHAPTER III

SWAMP LAND RECLAMATION IN STATES OTHER THAN MINNESOTA

It has been estimated that there were originally over 125,000,000 acres of swamp and overflowed lands in the United States;[1] an area of unproductive land as large as either Germany or France, or more than three times as great as all the New England States.[2] These wet lands were of two kinds: (1) tidewater or delta overflowed lands, (2) glacial swamps. Those of the first class extended from Virginia to Texas. In Florida there were about 19,800,000 acres; in Louisiana, 10,316,605 acres; in Mississippi, 5,760,200 acres; in Arkansas, 5,911,300 acres; and in North Carolina, South Carolina, Alabama, Georgia, and Texas, from 3,122,000 to 1,500,000 acres each. These lands include such swamps as there are along the lower course of the Mississippi River, the Jersey Marshes, and the Dismal Swamp of North Carolina and Virginia. The wet lands of the second class, that is, the glacial swamps, were most extensive in Minnesota, which had 7,332,308 acres; Michigan, 4,547,439 acres; Illinois, 4,421,000 acres; and Wisconsin, 2,560,000 acres.[3]

Because of the abundance of drier and better lands even in the eastern part of the United States, it was not until the middle of the nineteenth century that these wet lands received any attention from either state or federal government. Until 1850 all the great swamp tracts, except those included in the thirteen original states (Dismal, Okefinokee, eastern seaboard plain, Jersey marshes, and tidal lands of New England), remained in the national estate. In 1847 Senator Westcott, of Florida, introduced in the Senate a bill for the grant to his state, for the purpose of reclamation, of the overflowed lands surrounding Lake Okechobee, but it failed of passage.[4] About the same time a movement sprang up in the Middle West for the building of levees along the rivers; conventions were held in Memphis, St. Louis, and Chicago; and as a result of their resolutions and influence and of subsequent agitation, Congress was forced to take some action. It was not itself willing to undertake the work of building levees

[1] Guy E. Mitchell in *Review of Reviews*, 37:433 (1908).

[2] *World Almanac*, 1914, p. 424. Area in square miles: Germany, 208,780; France, 217,054; Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, total, 66,465; 125,000,000 acres equal 195,312 square miles.

[3] Classification by Van Hise in *Conservation of Natural Resources*, 344. Estimates by the United States Department of Agriculture, 60-61 Congress, *Senate Document 443*.

[4] Trustees of Internal Improvement Fund of Florida, *Minutes of Proceedings*, 7:415-437.

and draining lands but as there were in the Mississippi Valley over 32,000 square miles of swamp lands belonging to the nation, it began its policy of giving this land to the states for reclamation purposes by an act of September 28, 1850, entitled "An act to enable the State of Arkansas and other States to reclaim the swamp lands within their limits." [5] This act provided that "the proceeds of said lands whether from sale or by direct appropriation in kind, shall be applied exclusively, as far as necessary, to the purpose of reclaiming said lands by means of (the) levees and drains (aforesaid)." Later this act was extended to cover other states having swamp lands within their borders. By virtue of the definition in the act of Congress itself of the terms "swamp and overflowed lands," the grants conveyed all lands which in their natural state are unfit for cultivation because of the large amount of moisture in the soil. The states were given their choice of two methods of selection: (1) The field notes of the government survey could be taken as the basis for selection, and all lands shown by them to be swamp would pass to the states, or (2) the states could select the lands by their own agents and report the same to the Secretary of the Interior with proof as to the correctness of their selections.[6] Up to the year 1908 claims for 65,582,503 acres had been approved, and over 63,000,000 acres actually patented to the states.[7]

What has been actually accomplished towards making habitable and tillable these vast areas of wet lands which have been granted by the national government to the states, may best be seen by a review of the work which those states have done in reclamation and drainage, considering each state with reference to its own particular problems.

Florida has more overflowed lands within its borders than any other state in the Union. The Everglades surround Lake Okechobee in the south central part of the state, and from there stretch due south for one hundred miles to Cape Sable, ranging from twenty to forty miles in width, and comprising over 3,700,000 acres—an area greater than one-half of Florida, or the combined land surface of Connecticut, Rhode Island, and Delaware. Here and there in this region there are stretches of prairie land, but most of the Everglades are a saw-grass marsh with soil from three to fifteen feet deep, covered with five inches of water during the greater part of the year, and for many years the haunt of nothing but birds, mosquitoes, alligators, and snakes; penetrated not by white men, but only by the Seminole in his canoe.

From 1837 to 1860 various officers of the United States Army, stationed on the eastern coast of Florida, attempted to cross the glades, and during

[5] J. L. Matthews, *Conservation of Water*, 149, 150.
[6] Act of September 28, 1850.
[7] Guy E. Mitchell in *Review of Reviews*, 37:433 (1908).

the Seminole wars did considerable exploring.[8] In 1892 J. E. Ingraham succeeded in crossing the Everglades about forty miles south of Lake Okechobee, and during the last fifteen years various hunters and naturalists have worked their way through the swamps from the lake to Miami, so that to-day the mystery of the Everglades has been dissipated.[9]

As early as 1835 public men began to discuss the feasibility of draining the glades.[10] In the latter part of the very year in which Florida was admitted into the Union (December, 1845), its legislature by resolution pressed upon the attention of Congress the propriety of appointing engineers to survey the region. Shortly afterwards the Secretary of the Treasury at the request of Senator Westcott, of Florida, appointed Breckinbridge Smith to make an investigation into the problem of the Everglades. The latter's report, which was issued in 1848, spoke very favorably of the project to reclaim the overflowed lands of the peninsula. On January 23 of the same year (1848) General W. S. Harney wrote: "Of the practicability of draining the Everglades I have no question. That such work would reclaim millions of acres of valuable lands, I have no doubt." And many other public men of the time were strongly in favor of the plan to drain this Florida swamp.[11] In 1849 the legislature of Florida asked Congress to grant the Everglades to the state, "on condition that the state will drain them and apply the proceeds of the sale thereof, after defraying the expenses of draining, to the purpose of education."[12] In the same year, as we have already pointed out, Senator Westcott's bill for the grant of these lands to the state failed of passage in Congress,[13] but the act of September 28, 1850 named Florida as one of the grantees of swamp lands; so that it was in that year that the Everglades were granted to Florida.[14] But it was not until thirty-one years after the swamp lands within its borders had been granted to Florida that it made any effort to reclaim them for use. In 1881 the Trustees of the Internal Improvement Fund, to whom the legislature had granted the swamp lands of the state "irrevocably," for the purpose of reclaiming them, made a contract with a company headed by Hamilton Disston, the saw manufacturer of Philadelphia, which provided that the company should drain 9,000,000 acres of land adjacent to Lake Okechobee and render them "fit for cultivation by permanently lowering and keeping

[8] Expeditions by Major Childs in December, 1841, and Captain Dawson in 1855. S. N. Ball, "Reclaiming the Everglades," in *Putnam's Magazine*, 7:796 (April, 1910).

[9] S. S. Lupfer, "The Florida Everglades," in *Engineering News*, 54:278-280 (September 14, 1905).

[10] S. N. Ball, in *Putnam's Magazine*, 7:796 (April, 1910).

[11] For a series of letters relating to the scheme, see 62 Congress, 2 session, *Senate Document 89*.

[12] *Ibid.*

[13] T. E. Will, "The Everglades of Florida," in *Review of Reviews*, 66:451-456 (October, 1912).

[14] Act of September 28, 1850.

reduced the waters of Lake Okechobee."[15] Disston and his associates were to do the work at their own expense, and were to receive as consideration a grant of the alternate sections of land drained. This inaugurated the first of the two successive policies of reclamation adopted by the trustees, namely, (1) by the letting of contracts, (2) through construction work under the trustees themselves. The first policy may be said to have prevailed from 1881 to about 1905.[16] In 1898 a contract was made with the East Coast Drainage and Sugar Company for draining 8,000,000 acres of land at the expense of the company, the land to be conveyed in fee to the corporation upon payment to the state of twenty-five cents an acre. Not a single yard of earth was removed by the company under the contract. The trustees made a few other contracts of the same kind, but these involved much smaller amounts of land.

Not only did the state grant much of its swamp lands to drainage companies, but the legislature made extensive grants to railroads (evidently, though not expressly, on the condition that the grantees should reclaim from water the lands granted), and actually deeded over 8,000,000 acres of swamp lands to these transportation companies. But the results of these grants, so far as any progress in reclamation was concerned, were so "diminutive that no record has been made of them."[17] These grants to railroads involved the trustees in a great deal of litigation which is still somewhat unsettled, imperiled the drainage fund itself, and for a considerable period of time completely tied the hands of the trustees and prevented their taking any steps towards reclamation.[18] It is true that the Disston Company built about ninety miles of canals, but their work had no effect on the drainage of the Everglades. A few acres were really well drained in the Kissimmee Valley, but this was under unusually favorable conditions, and only temporarily. Later this tract of drained land was used during a temporary withdrawal of Mr. Disston as a bait for gullible investors.[19] Nevertheless the trustees conveyed 1,052,711 acres of land to the company, and its successor claims that it is entitled to a conveyance of 347,288 acres more.

Thus, as a result of the policy of drainage by contract with land and drainage companies, not more than 100,000 acres of the swamp lands of Florida were actually made fit for cultivation during a quarter of a century, and then only partially and temporarily. For this comparatively small benefit the state paid an enormous price, since it conveyed away over 10,000,000 acres of land. The failure of this plan of reclaiming the swampy

[15] Trustees of Internal Improvement Fund of Florida, *Minutes of Proceedings*, 7:415-437. For contracts, see pp. 432, 437, 463, 480, 503.

[16] *Ibid.*, 415-437.

[17] *Ibid.*, 102. In a letter from W. S. Jennings, counsel for trustees.

[18] *Ibid.*, 102 *et seq.* and 314-321.

[19] S. S. Lupfer, in *Engineering News*, 54:278-280 (September 14, 1905).

areas of the state led to the inauguration of the policy of land drainage under the direct supervision of the government itself. This was the second plan of reclamation adopted by the Trustees of the Internal Improvement Fund,[20] and its adoption was brought about principally through the efforts of W. S. Jennings, who for a considerable number of years had been general counsel for the trustees.

Until the year 1901 there had been very little public discussion in Florida of its swamp land problem, the grants to railroads and drainage companies arousing little or no comment. But in that year Mr. Jennings was inaugurated as governor and the first step was taken towards really accomplishing something in the work of reclamation. Governor Jennings refused to convey any more swamp lands to the railroads, on the ground that the condition in the grant from the national government to the state to the effect that the lands be drained had not been performed. This precipitated a legal and political fight between the governor and his supporters on the one side, and the railroad companies on the other. Litigation tied the hands of the governor, and prevented the state from doing any work during the term of Mr. Jennings, and he was ineligible for reëlection as the result of a constitutional provision limiting the term of governor to one term. But a successor to the policy of Governor Jennings was elected after a bitter contest with the railroad companies, and the work of reclamation intrusted to a drainage board of which the governor is chairman. This board has authority to lay out drainage districts, and to levy a tax on the lands therein not to exceed ten cents an acre, the receipts therefrom to be used in the work of drainage. A drainage district was at once created to include the Everglades, and a tax of five cents an acre on the swamp lands therein yielded an annual income of more than $200,000 a year. This income still continues, and, together with the proceeds from the sale of some of the state lands, furnishes the means of carrying on the work at the present time. This work is being done by the Trustees of the Internal Improvement Fund and the drainage board, without the use of contractors.[21]

The engineering problem to be solved in the draining of the Everglades is comparatively simple. Someone has said that Lake Okechobee and the Everglades are like a great tank on the top of a gently sloping house roof on the lower edge of which is an elevated rim. If the tank runs over the rim will hold back the water. The tank is the lake, and the rim is composed of a ledge of coral rock; to cut channels through this rock to the sea is to free the land between the ledge and the lake from the excess of water which now renders it unfit for cultivation, and to reclaim the Ever-

[20] Trustees of Internal Improvement Fund of Florida, *Minutes of Proceedings*, 7:415-437.
[21] D. A. Willey, "Draining the Everglades," in *Scientific American*, 104:67-69 (1911).

glades. A system of canals will be opened, but it is not intended to empty Lake Okechobee, whose continued existence is advisable for several reasons. It is an inland sea valuable for purposes of pleasure and of commerce, and its water is needed for canals and waterways and to supplement the rainfall.[22] At the present time several large dredges are at work cutting ditches and canals, and the state is making real progress in its reclamation work.

The question may well be asked as to what these drained lands are really worth after they have been made fit for cultivation. It is difficult to secure accurate estimates. Those interested in the work have stated that the lands are worth one hundred dollars an acre or more, while others say that such statements are absurd.

In 1913 the United States investigated the subject, but for some reason the Senate document[23] which was printed as a result was more in the nature of an advertising prospectus for a real estate company than an unbiased or scientific statement of facts.[24]

In Louisiana there were originally about 10,000,000 acres of swamp lands, comprising nearly one third of the total area of the state.[25] Although the lowlands in the northern part of Louisiana could be drained by the comparatively simple process of building ditches and levees, yet along the seaboard there is a vast tidal marsh which is inundated when hurricanes sweep across the Gulf, and so low that great dykes similar to those of Holland would have to be built in order to wall out the waters of the sea. Because of the difficult engineering problems to be solved in the draining of these coast-line swamps, and the proportionately large amount of overflowed lands in the state, Louisiana was confronted with a vast engineering and financial problem that would have been hard to

[22] T. E. Will, in *Review of Reviews*, 66:451-456 (October, 1912).

[23] 62 Congress, 2 session, *Senate Document 89*.

[24] H. P. Willis, "The Everglades," in *Collier's*, 49: 15, 16 (March 30, 1912). *Senate Document 89* was well illustrated with reproductions of photographs purporting to show scenes on reclaimed lands in the Everglades; it later developed that some of these pictures were of lands far from the saw-grass marsh lands of the glades, and in particular two, entitled respectively "A Nine-Year-Old Orange Grove on Drained Saw-Grass Marsh," and "Harvesting Sugar Cane, St Cloud Plantation."

The use to which the document was devoted by enterprising sellers of Florida lands is illustrated by the following circular:

"Business Opportunity—United States Official Indorsement

First time in the history of the Government that such a thing has been done. The Sixty-second Congress has recently issued a document of 208 pages indorsing the great reclamation, climate, healthfulness, and fertility of the Everglades. The greatest opportunity of the century is offered here to the man with small capital to establish himself where the evident coöperation of the Government is sufficient to make the community rich and prosperous.

Free literature. Call for some. Everglades Land Company."

Other authorities on Florida are: N. P. Broward, "Draining the Everglades," *Independent*, 64: 1448-1449; N. P. Broward, "Homes for Millions: Draining the Everglades," *Collier's*, 44:19; Richard Hargrave, Address before the National Drainage Congress, New Orleans, 1912.

[25] *World Almanac*, 1914, p. 690, gives the area as 48,720 square miles.

solve even had the state acted with much more wisdom and foresight than it did.

As it is this state was seriously handicapped in its drainage work by two things: (1) a lack of adequate drainage laws, and (2) the sale of the swamp lands for practically nothing. How much these lands have really brought the state it is impossible to tell. In 1902 some of these lands were sold by the commonwealth for twelve and one-half cents an acre, which was just twelve and a half times as much as the state had received for similar lands a few years earlier; and in 1903 the price was raised to twenty-five cents an acre. Not only was much of the overflowed surface of Louisiana sold for a mere trifle to individuals and private corporations, but many thousands of acres were turned over to the various levee boards who sold them outright instead of securing their reclamation.[26] Consequently Louisiana to-day owns very little of the swamp land within its borders, and its drainage problem is greatly complicated because of a lack of funds for reclamation work, and the opposition of some of the large landowners of the state.[27]

Furthermore it is only recently that Louisiana has secured a general drainage law that is satisfactory. Under the constitution of 1868 there was no limit to the authority of the minor political subdivisions of the state to incur debts and issue bonds, and, as a result, every parish and municipality became heavily indebted during the reconstruction period. During the reaction following the assertion of white domination, constitutional conventions placed such severe restrictions upon the power of municipal corporations and of parishes to incur indebtedness that works of internal improvement were rendered impossible. But in 1898 a constitutional change authorized the issuing of bonds for the construction of drains and other public improvements,[28] and at almost every session of the legislature the power of drainage districts has been increased, so that at the present time at least the laws do not hamper reclamation work in Louisiana.[29] But this delay, coupled with the state's sale of its swamp lands for insignificant sums, was very costly to it, for the commonwealth has reclaimed but 120,000 acres of the overflowed lands within its borders.[30] Although the second state in the Union with respect to the amount of wet lands fit for drainage granted to it by the federal government, Louisiana ranks very low as to reclamation work accomplished.

Practically all of the 2,700,000 acres of swamp lands in Georgia is still

[26] Letter to the writer from John A. Kinze.

[27] Matthews, *Conservation of Water*, 168-170.

[28] Constitution of 1898, Article 281.

[29] *Laws*, 1910, Acts 197; 256; 317. Address of Judge R. E. Milling before the National Drainage Congress, New Orleans, 1912.

[30] 60 Congress, 1 session, *Senate Document 443*, 8.

unreclaimed and unfit for cultivation. This constitutes approximately one fourteenth of the area of the state. A large part of this land is included in the Okefinokee Swamp, its name being the Indian equivalent for the words "trembling earth."[31] In the winter of 1866-67 Colonel R. L. Hunter, who was employed by the state, ran a line of levels around the swamp for the purpose of determining the practicability of draining it, but his report and maps were lost during the Civil War and not found again until 1875, when the State Geological Survey and the Atlanta Constitution coöperated in several expeditions systematically to explore the swamp with a view to its ultimate drainage.[32]

In 1889 the legislature sold to the Suwanee Canal Company that part of the swamp which belonged to the state for twenty-six and one-half cents an acre, the total area sold being 380 square miles, or approximately 243,200 acres. The plan of the company was to cut ditches and use them to get out the large amount of cypress and other valuable timber which the swamp was known to contain and then to use these ditches for draining the land for agricultural purposes. A canal forty-five feet wide and six feet deep was cut into the swamp for a distance of twelve miles and large quantities of timber taken out, but operations were discontinued before the canal was sufficiently completed to have any effect in draining the swamp. The successors in interest of the Suwanee Company in the last two or three years have been continuing the work in the northwestern part of the swamp, but only for the purpose of cutting and removing timber. No action was taken by the state after the surveys of 1875 until 1894, when the law establishing the Geological Survey was amended so as to make it the duty of the State Geologist to survey swamp lands and prepare plans and estimates of the cost of draining them, but through lack of appropriations to carry on the work not very much was accomplished.[33]

For several years prior to 1911 there had been some agitation for drainage legislation in Georgia, but this movement was spasmodic and unproductive of results until that year, when a general drainage act was passed which will enable landowners to carry out large coöperative drainage projects.[34] Because of the comparatively recent enactment of its drainage

[31] The small islands dotting the swamp are generally surrounded by a floor of moss, which is usually firm enough to hold a person's weight, but it rises and falls for a distance of from ten to twenty feet, hence the name. (Report of Dr. Little of Georgia Geological Survey. Published in *Handbook of Georgia* by the Commissioner of Agriculture of Georgia, 1876.)

[32] R. M. Harper, "Okefinokee Swamp," *Popular Science Monthly*, 74:596-614 (June, 1909). During the Civil War deserters from the Confederate Army lived for a considerable time on "Soldier Camp Island." Paul Fountain described Okefinokee in his *Great Deserts and Forests of North America*, but it is doubtful if he ever saw it himself. *Ibid.*, 598.

[33] Geological Institute of Georgia, *Bulletin* 25, 1911, pp. 14-19; R. T. Nesbitt, *Georgia, Her Resources and Liabilities* (published by the Georgia Department of Agriculture, 1906).

[34] L. R. Atkin, President of the Georgia Drainage Congress, in an address before the National Drainage Congress, New Orleans, 1912.

laws, Georgia, however, has done practically no work whatever in the direction of reclaiming the 2,700,000 acres of swamp land within its borders.[35]

There were, originally, 4,421,000 acres of swamp land in Illinois.[36] These were typical glacial swamps, the water having settled in pot holes and depressions made by the Canadian glacier which once covered Illinois and the surrounding states. The people of Illinois were quick to seize their opportunities for profitable drainage work, and in the constitution of 1870 they authorized the general assembly to pass laws "permitting the owners or occupants of land to construct drains and ditches for agricultural and sanitary purposes across the lands of others."[37] In 1871 the legislature of Illinois passed the first of a series of drainage laws which have been copied in many other states,[38] and which have enabled landowners to coöperate in removing the surplus water from over 3,496,000 acres of the swamp lands of Illinois.[39]

A river and lakes commission was appointed under an act of July 1, 1911, one of its duties being the collection and publication of drainage data. Its investigators and other men interested in the question have estimated that the drainage districts of Illinois have done their work at an average cost of approximately fifteen dollars an acre.[40] At the present time the work is being carried on in 800 drainage districts, with an aggregate area of 12,000 square miles. There are several large projects now well under way, such as Lower Salt Fork Drainage District covering 168,000 acres and calling for 23 miles of ditch and 525 miles of road, and another for 110,000 acres and 55 miles of levee.[41] None of the work which is being done at the present time will bring anything into the state treasury, since

[35] 60 Congress, 1 session, *Senate Document 443.*

[36] *Ibid.*

[37] Constitution of Illinois, Article IV, section 31.

[38] Act of April 24, 1871, entitled "An Act to provide for the construction of drains, levees, and other works." For a survey of decisions of the supreme court of Illinois relating to the constitutionality of Illinois drainage statutes, see Association of Drainage and Levee Districts of Illinois *Annual Report,* 1911, pp. 60-65. As to the effect of drainage legislation in Minnesota, see Illinois Geological Survey, *Bulletin* 8. ch. 5.

[39] 60 Congress, 1 session, *Senate Document 443.* The Rivers and Lakes Commission makes an estimate of 2,571,437 acres (letter to the writer from Secretary Robert I. Randolph).

[40] Robert I. Randolph in a letter to the writer in 1913. "Total assessment for 2,571,437 acres which the Rivers and Lakes Commission has located as being in organized drainage districts amounts to $27,636,583. Average assessment an acre is $10.75."

J. J. Harman, of Harman Engineering Company, in a letter to the writer in 1913. "Reclamation cost per acre of the various drainage districts has varied greatly, depending on the size of the districts, the amount of hill water to be taken care of, and the general type of construction. Cost is from $10 to $12 as minimum to $70 to $80 as maximum; perhaps the average price has been about $25 to $30 per acre."

P. R. Kellar, Secretary of the National Executive Committee of the National Drainage Congress, in a letter to the writer December 24, 1912. As to work done, see also Illinois Association of Drainage and Levee Districts, *Bulletin* 4.

[41] Robert I. Randolph in address at the National Drainage Congress, New Orleans, 1912.

none of the swamp lands to be benefited belong to the state. All of the overflowed lands in Illinois have passed into the hands of individuals or of private corporations.[42]

Although only two other states in the Union contain more swamp lands than Mississippi, yet that state has done very little to reclaim the wet wastes within its borders, which still comprise about 5,760,200 acres.[43] Many of these lands are situated along the river deltas and require the building of levees and in many cases of pumping stations. It is estimated that 3,000,000 acres of land in Mississippi are permanent swamp: the remaining 2,760,200 acres are only periodically overflowed.[44] In 1907, state and federal engineers made a coöperative survey of lands in the Upper Yazoo Delta, containing 208,726 acres of land, and reclamation work there is now under way.[45]

Arkansas is the fourth state in the Union with respect to the amount of its swamp lands. It has 5,911,300 acres.[46] Much of this land requires the building of levees along streams flowing into the Mississippi, the banks of which are periodically overflowed. The largest swamp in the state is the St. Francis swamp, which extends into Missouri. These lands were covered with a comparatively heavy growth of hardwood timber—oaks, immense cypresses, hickories, and gum trees, which originally constituted one of the most magnificent resources of the Mississippi Valley. But instead of following the wise policy of draining these lands itself, and then selling them at advanced prices, Arkansas disposed of them for a song. Many thousands of acres were sold at fifty cents an acre to companies interested in the hardwood trade; and even after enough levee work had been done in other states to demonstrate the profitableness of drainage, that is, as late as 1893, the state was still selling large areas of the bottom lands along the St. Francis at one dollar an acre. As a result of this prodigal policy of the state practically all of the swamp lands in Arkansas are now privately owned.

Though the state owns no swamp lands itself, yet a considerable amount of work has already been accomplished in protecting the bottom lands by levees,[47] and land which formerly sold for one dollar an acre has risen in value to twenty dollars when partly drained, and to one hundred dollars when timber and water were finally removed, the timber meanwhile yielding from fifteen to twenty dollars an acre. A drainage act passed in 1909

[42] Letters to the writer cited in note 40, page 27.

[43] 60 Congress, 1 session, *Senate Document 443.*

[44] 60 Congress, 1 session, *Senate Document 151,* vol 7.

[45] 60 Congress, 1 session, *Senate Document 443.*

[46] *Ibid.*

[47] Matthews, *Conservation of Water,* 158-168. It is estimated that in Missouri and Arkansas $6,000,000 has been invested in levees. Of this amount the federal government has paid $2,000,000 for benefits to navigation.

was amended in 1911. The laws seem to be satisfactory and there are projects now under way which will result in reclaiming approximately 1,000,000 acres.[48]

Most of the 2,789,600 acres of swamp in Missouri were timber-covered bottom lands similar in character to those of Arkansas. Like the latter state, Missouri has followed the policy of selling these state lands at ridiculously low prices, chiefly to hardwood lumber companies. Thus, as late as 1870 or 1880 large tracts of land in the southeastern part of the state were sold for a few cents an acre; and in 1868, 800,000 acres of swamp land which has now been reclaimed and at the present time is worth from sixty to one hundred dollars an acre, was sold for $663.95.[49]

Reclamation work in Missouri first began in the southeastern part of the state, when the situation became so bad as to make hundreds of miles of highways impassable, and to cause the railroads great difficulty in maintaining their trackage. The fact that practically all of the state lands had been sold was somewhat of a handicap in carrying on drainage work, yet the Missouri laws were so well drawn[50] that the work was made much easier than it has been in other states with less practicable statutes; and a considerable amount of land has already been reclaimed. Although what may be called the "drainage period" of the state did not begin until about 1900, yet up to 1912, 191,698 acres had been reclaimed. Crops are being raised on over half of this reclaimed land, and the value of the agricultural products of the state increased by $5,958,990 a year.[51]

The success of completed work has caused the drainage movement in Missouri to spread rapidly and work is now being planned which will cost considerably more than $7,000,000 and reclaim 927,040 acres. These projects are of varying character as to size and point of development, running from mere talk as to the reclamation of 1,600 acres in one county (Jackson County) to the stupendous project of the Little River District, which has been in progress of organization for over eight years. This district has been incorporated, the surveys completed, plans made, and contracts let. The work will require the dredging of 700 miles of ditches, the construction of 40 miles of levee, and the expenditure of $4,880,000, but it will reclaim 530,000 acres of land. When the movement for the organization of this district was begun, the land therein was valuable only for uncut timber or speculative purposes and sold at from one dollar and twenty-five cents to five dollars an acre. It is now selling at prices ranging

[48] Act 279 of 1909, Acts 136 and 221 of 1911; declared constitutional April 1, 1912 in Lee Wilson and Company *v.* Compton Bond and Mortgage Company. The Morgan Engineering Company is now draining 731,000 acres in Arkansas (Circular, 1912).

[49] Missouri Bureau of Labor Statistics, *Supplemental Report*, 1910, p. 10.

[50] The model law suggested by the National Drainage Congress is the same as that of Missouri except for minor changes.

[51] Missouri Waterways Commission, *Bi-annual Report*, 1912, p. 27.

from eighteen to twenty dollars, even though far from railways, uncleared, and undrained.[52] In spite of the fact that nearly 2,000,000 acres of the swamp lands of Missouri have already been reclaimed, there still remain approximately 1,500,000 acres which need draining; but there is no doubt that much of this work will be done in the not-far-distant future.[53]

The 2,748,160 acres of swamp land[54] in North Carolina are of three kinds: (1) heavily timbered gum and cypress swamp in the eastern part of the state, (2) open marsh which has little timber and is too wet even for grazing, but productive of good crops when thoroughly drained and limed, (3) poorly drained cleared land which has been under cultivation for one hundred years; this land produces a good crop one year, but may be profitless for the next three years because of inadequate drainage.[55]

Although the feasibility of reclaiming the wet areas of the state had been discussed pro and con for over fifty years, it was not until 1908, when the North Carolina Drainage Association was organized, that any definite steps were taken toward actually doing any work. Up to that time land drainage had been hindered by the lack of any law which would enable landowners representing a majority of the area of a given swamp district to build ditches over the objection of a small minority of landowners, or to finance any works, by the issuing of bonds. This first convention of the drainage association adopted a resolution endorsing a drainage bill, and, as a result, the legislature of 1909 passed a general act authorizing the formation of drainage districts and the issuance of bonds by them.[56] Since the passage of this act a surprising amount of work has been inaugurated. Fifty-three drainage districts have been organized, embracing over 700,000 acres of overflowed land. None of these lands, however, belong to the state.[57] Of course reclamation work in North Carolina was started so recently that so far very little work has been fully completed, but several ditches are now under construction, and the work is being pushed with vigor.

South Carolina has not drained any of its 3,122,120 acres of swamp land, but the legislature has recently passed several good drainage laws,

[52] *Ibid.*, 13-28.

[53] *Ibid.*, 23. 60 Congress, 1 session, *Senate Document 443*, has the following estimate: original area of swamp lands in Missouri 2,789,600 acres; 350,000 drained; balance undrained, 2,439,600. The above figures, from estimates in the report of the Missouri Waterways Commission, would give a total for original swamp land area of 3,500,000 acres. The discrepancy is probably due to the fact that the commission had more accurate data, and included in its estimate much land that is only flooded infrequently.

[54] 60 Congress, 1 session, *Senate Document 443;* North Carolina Drainage Association, *Proceedings*, 1909, p. 25.

[55] J. O. Wright in *Ibid.*, 11, 12.

[56] North Carolina, *Laws*, 1909, ch. 442; 1911, ch. 67 and 177. Bond issue under laws held valid in 152 *North Carolina*, 738.

[57] North Carolina Drainage Association, *Proceedings*, 1909, p. 7; *Ibid.*, 1911, pp. 5-8; letter to the writer from J. H. Pratt, State Geologist of North Carolina, November 17, 1912.

drainage districts have been organized,[58] and ditches are being cut through the sandy and peaty bogs which for a century have been malaria-breeding swamps.

Michigan has reclaimed 1,600,000 out of the 4,547,439 acres of overflowed lands within its limits; the state has yet to drain approximately 3,000,000 acres.[59]

No drainage projects have been taken up by the commonwealth, except that the legislature has passed laws enabling landowners to construct ditches under the drain commissioners.[60] Most of the southern counties now have reclamation projects under way, and in Bay and Saginaw counties, lands which are overflowed every spring with from three to six feet of water are being drained, levees built, and pumping stations established. There are from 40,000 to 50,000 acres of this land in these two counties alone which will be reclaimed in a few years.[61]

The first comprehensive drainage law in Wisconsin was passed prior to 1891, but it was declared invalid since it did not state that the fact that a drain was of public benefit or utility must be a prerequisite to its establishment. An act of 1891 was upheld, however, and has since then been repeatedly amended.[62] But as a result of the doubtful constitutionality of drainage laws, and the abundance of other good lands in the state, Wisconsin was comparatively slow to start drainage operations on any large scale, and it has reclaimed but 200,000 of the original 2,560,000 acres of swamp lands within its borders,[63] and practically all of this land has been privately owned. About 400,000 acres are now included in drainage districts, and there is more or less work being carried on at this time in the state,[64] but on the whole Wisconsin is not very far advanced in drainage work.[65]

There are 3,420,000 acres of overflowed land in California.[66] Seven hundred thousand acres have already been reclaimed. An area of over 1,000,000 acres lying along the San Joaquin and Sacramento valleys is being drained by building levees and pumping out the waters.[67]

Texas and Alabama have nearly 4,000,000 acres of swamp land, and

[58] 60 Congress, 1 session, *Senate Document 443;* Matthews, *Conservation of Water,* 166; letter to the writer from J. H. Squires, Agronomist of Dupont Powder Company, December 16, 1912.

[59] 60 Congress, 1 session, *Senate Document 443.*

[60] *Drainage Laws of Michigan,* revision of 1911.

[61] Letters to the writer from J. A. Jeffery, of Michigan Agricultural College, April 20, 1912; from J. E. Portèr, of Louisiana Golden Meadows Company, December 17, 1912.

[62] Wisconsin, Legislative Committee on Water Powers, Forests, and Drainage, *Report,* January 24, 1910, pp. 37-39.

[63] 60 Congress, 1 session, *Senate Document 443.*

[64] Letter to the writer from E. R. Jones of the University of Wisconsin, April 17, 1912.

[65] Report cited in note 62 *supra.*

[66] 60 Congress, 1 session, *Senate Document 443.*

[67] Matthews, *Conservation of Water,* 170-179; 60 Congress, 1 session, *Senate Document 151,* vol. 7:9.

yet they have made practically no progress in the direction of making them fit for cultivation.[68] Alabama does not even have a general drainage law, and all that has been accomplished in that state has been experimental in character and confined to small tracts owned by individuals.[69]

Swamp land in Indiana has been reclaimed in three ways: (1) by coöperating landowners acting under the general drain laws of the state; (2) by direct appropriation from the state treasury of money to drain especially large areas;[70] (3) by drainage companies such as the Kankakee Valley Drainage Company, which was organized in 1870 but accomplished nothing of importance until 1892.[71]. The work is still being carried on by adjoining owners under the drainage laws, and by private corporations, but all of this land is privately owned.[72] So far Indiana has drained 3,358,000 acres of swamp land.[73]

Virginia had no drainage law until 1910, when an act was passed[74] closely modeled on the North Carolina law of 1909. Several districts have been organized, and there is a project now under consideration to drain part of the Dismal Swamp, but as yet practically no work has been accomplished,[75] and there are 800,000 acres of swamp lands unreclaimed.[76]

Until recently decisions of the supreme court of Tennessee had been against the principle of local taxation for local improvements, and as a consequence no drainage act was possible. A change of position by the court, however, led the way to the enactment of a general drainage statute in 1909, which contained the usual provisions for the assessment of benefits against the owners of lands drained. But as yet almost nothing has been accomplished beyond the making of plans and the bare commencement of drainage operations.[77]

In South Dakota there never has been a very large amount of swamp land. And in that state the drainage question is not so important now as it was a few years ago. This is true because a considerable portion of the land has already been reclaimed through county commissioners under laws

[68] 60 Congress, 1 session, *Senate Document 443;* Alabama, 1,479,200 acres; Texas, 2,240,000 acres.

[69] Letters to the writer from J. F. Duggar, of the Alabama Experiment Station, April 1, 1912, and J. C. Cheney, Chief Clerk of the Department of Agriculture and Industries of Alabama, December 16, 1912.

[70] Alabama Experiment Station, *Circular* 80, 7. Thus the legislature appropriated $65,000 in 1889.

[71] *Ibid.*

[72] Letter to the writer from A. T. Wiancko, of the Agricultural Experiment Station of Purdue University, April 18, 1912.

[73] 60 Congress, 1 session, *Senate Document 443.*

[74] Ch. 159 of Act of March 12, 1912, amends the Act of March 17, 1910.

[75] W. W. Old, Jr., in address at the Drainage Convention of the Southern Commercial Congress, Nashville, Tennessee, April 8, 1912.

[76] 60 Congress, 1 session, *Senate Document 443.*

[77] Tennessee, State Geological Survey, *Annual Report,* 1910, *Press Bulletin* 9, 45; *ibid., Bulletin* 3.

as amended in 1909; and because a heavy drought for the last few years has greatly decreased the need for drainage. Although petitions have been filed with the state engineer calling for the drainage of over 365,000 acres by means of 476 miles of main ditches in 27 counties in the eastern part of the state, yet the work is merely in its preliminary stages.[78]

In Iowa there has been a very large amount of drainage work accomplished, but information in detail is not available.

Utah, Oklahoma, Colorado, Montana, and Wyoming have drainage laws, but they were adopted only recently, and the work done in these states is comparatively insignificant in amount.[79]

From the preceding review of the progress of swamp land reclamation in states other than Minnesota, it is clear that in practically no state has the condition in the federal swamp land grant to the effect that the proceeds from the overflowed lands be used for their drainage, been performed. Thus, Florida conveyed most of the lands granted to it to railroads and to drainage companies which accomplished very little. Arkansas and Louisiana sold their overflowed land at prices ranging from one cent to one dollar an acre and Missouri did little better. In very few of the states is swamp land still owned by the states.[80] The greatest amount of reclamation work has been done in Minnesota, Illinois, Iowa, Indiana, and Michigan. About one sixth of the original swamp land area of the United States has now been drained. Those states which have a considerable amount of overflowed lands within their borders, but have only recently commenced the work of making them fit for cultivation, and which at the present time have the greatest amount of drainage work yet to be done are Florida, Louisiana and Arkansas. Michigan and Minnesota have done much, but they still have a great deal to do.[81] There are at this time in the United States about 80,000,000 acres of swamp lands yet unreclaimed.

[78] State Engineer of South Dakota, *Biennial Report*, 1911-1912, pp. 163, 164. Letter to the writer from A. B. McDaniel, of the University of Illinois, formerly of South Dakota, December 18, 1912.

[79] 60 Congress, 1 session, *Senate Document 443.*

[80] Van Hise in his *Conservation of Natural Resources*, 334, estimates that approximately ninety-five per cent of the swamp lands granted to the states by the federal government have passed into private hands.

[81] See 60 Congress, 1 session, *Senate Document 443.*

CHAPTER IV

DRAINAGE LEGISLATION AND ADJUDICATION

Thirty-six states of the Union have now enacted general drainage laws for the purpose of providing the legal machinery which is necessary if drainage work involving any considerable amount of land is to be successfully carried on.[1] These laws apply to lands which can not be drained or protected from overflow by their owners without building ditches across the lands of others, so that it becomes necessary to provide a system of procedure that will enable the more enterprising proprietors to coöperate in draining their farms without being blocked in their efforts by a small minority who refuse to allow ditches to be built across their lands. These laws also aim to insure adequate drainage outlets, remuneration for property taken or injured for the common good, and an equitable distribution of the costs of the work.

In the constitutions of some states the legislatures have been expressly granted the power to pass such acts;[2] but even in the absence of express constitutional authorization to the legislatures, the courts have quite generally sustained such statutes as a valid exercise of the police and taxing powers, and of the power of eminent domain.[3] Of course the taking[4] or injuring of the private property of the non-consenting or objecting landowners under the power of eminent domain, would be unconstitutional and unlawful, unless the purpose of the work to be done were public in character;[5] and it is for that reason that most of the general drainage laws now in force expressly state that, as a condition precedent to the establish-

[1] 60 Congress, 1 session, *Senate Document 438*, 5, gives 23, but since then laws have been enacted in Georgia, Wyoming, Virginia, and other states. (See Appendix 2.)

[2] Constitution of Iowa, and especially constitution of Illinois of 1870, art. iv, sec. 31, as amended in 1878; constitution of Florida of 1887, art. xvi, sec. 28; constitution of New Mexico of 1911, sec. 186. See also discussion of Louisiana statutes in Appendix 2.

[3] Duke *v.* O'Bryan, 100 *Kentucky*, 710 (1897); Lien *v.* Norman County, 80 *Minnesota*, 58 (1900); In re Drainage Application, 35 *New Jersey Law*, 497 (1872); Sessions *v.* Crinkilton, 20 *Ohio State*, 349 (1870); Bryant *v.* Robbins, 70 *Wisconsin*, 258 (1887); Wurts *v.* Hoaglund, 114 *United States*, 606 (1885); Donnelly *v.* Decker, 58 *Wisconsin*, 461 (1883); Zigler *v.* Menges, 121 *Indiana*, 99 (1889); Gifford Drainage District *v.* Shroer, 145 *Indiana*, 572 (1896); 14 *Cyclopedia of Law and Procedure*, 1025; Freund, *Police Power* (ed. 1904), sec. 127.

[4] Digging of ditches is a "taking" of land. Mills, *Eminent Domain*, sec. 20; Smith *v.* Gould, 61 *Wisconsin*, 31 (1884); Donnelly *v.* Decker, 58 *Wisconsin*, 461 (1883); In re Theresa Drainage District, 90 *Wisconsin*, 301 (1895).

[5] Coster *v.* Tidewater Company, 18 *New Jersey Equity*, 54 (1866); Reeves *v.* Treasurer, 8 *Ohio State*, 333 (1858); Gilbert *v.* Foot cited in 5 *Barbour's New York Supreme Court*, 474, 483 (1849); Jenal *v.* Green Island Drainage Company, 12 *Nebraska*, 163 (1881); Duke *v.* O'Bryan, 100 *Kentucky*, 710 (1897); Fleming *v.* Hull, 73 *Iowa*, 598 (1887).

ment of any ditch or drain or the assessment of any damages or benefits, the work must have been found to be of general utility, or conducive to the public health or welfare.[6] Statutes have been held invalid because not requiring the public purpose to appear, even although they provided for full compensation to the owner of the lands across which the ditches were to be constructed.[7] Of course it is clear that mere payment for property taken is not sufficient; it must never be for a private purpose. Thus, the supreme court of Wisconsin has held that a statute authorizing drains for agricultural, mining, or sanitary purposes, without requiring it to be necessary or desirable to promote any public interest, convenience, or welfare, is not valid. The court, after pointing out that the word "sanitary" in the act did not import the idea of public health, said: "No doubt such an improvement may be useful to some, or perhaps many, private owners of land, by way of increasing the usefulness and value of their lands. But that is merely a private advantage. It interests the public only indirectly and remotely, in the same way and sense in which the public interest is advanced by the thrift and prosperity of individual citizens. But one man's property can not be taken to make another man's home more cheerful or healthful. It is only when it will make the homes of the public more healthful, that any man's property can be taken for sanitary purposes."[8] And private property can not be taken for reclamation works merely because of convenience to the majority of landowners or to the public; if the object can be accomplished practically as well in some other way, the land of the individual can not be taken from him for use as a right of way against his will.[9]

In passing upon the constitutionality of drainage laws there has been some difference of opinion among the courts as to what is a public purpose. Some courts have held that in order to make the purpose public, the drain must be necessary to preserve the public health. Thus, the su-

[6] For example, Minnesota, *Laws*, 1905, ch. 230, sec. 10; *General Statutes*, 1913, sec. 5532. And most acts provide that they shall be liberally construed so as to promote public health, etc. See Minnesota, *Laws*, 1905, ch. 230; Idaho, *Session Laws*. 1913, ch. 16, sec. 40; Kansas, *Laws*, 1911, ch. 168, sec. 37; Kentucky, *Acts*, 1912, ch. 132, sec. 49; Mississippi, *Laws*, 1906, ch. 132, sec. 30.

[7] In re Theresa Drainage District, 90 *Wisconsin*, 301 (1895).

[8] *Ibid.* So in McQuillon *v.* Hatton, 42 *Ohio State*, 202 (1884) the court said: "The use that will justify the taking of private property by the power of eminent domain, is the use by or for the government, the general public or some portion of it; and not the use by or for particular individuals, or for the benefit of certain estates. The use may be limited to the inhabitants of a small locality, but the benefit must be in common and not to a very few persons or estates. The prosperity of each individual conduces, in a certain sense, to the public welfare, but this fact is not a sufficient reason for taking other private property to increase the prosperity of individual men. The draining of marshes and ponds may be for the promotion of public health and so become a public object; but the draining of farms to render them more productive is not such an object. . . . . The mere fact that the proposed ditch would enable the parties to raise more or larger crops, did not authorize a verdict in favor of establishing the ditch."

[9] Rice *v.* Wellman, 5 *Ohio Circuit Court*, 334; Caldwelt *v.* Harrison Township, 2 *Ohio Circuit Court*, 10; 6 *American and English Encyclopaedia of Law* (1st ed.), 515.

preme court of Michigan, in the case of Kinnie *v.* Bare[10] said: "Drain laws which take from the citizen his private property against his will, can be upheld solely upon the ground that such drains are necessary for the public health. They proceed upon the basis that low, wet, and marshy lands generate malaria, causing sickness and danger to the health and life of the people; that when they are of such character as to injure the health of the community, they become and are public nuisances, which ought to be abated, and the Legislature have the right, under the police power inherent in every government, to protect the people from plague and pestilence, and to preserve the public health. But drainage for the purpose of private advantage, such as improving the quality of the land, or rendering it more productive or fit for cultivation, can not be justified under the police power. Neither public convenience nor public welfare, independent of considerations of the public health, will justify the Legislature in the enactment of laws 'for the construction and maintenance of drains, and the assessment of taxes therefor'. It is evident that, where the public health is not affected by the existence of low, swamp lands, the only object to be accomplished by their drainage is the improvement of the land itself." This principle to the effect that private property can not be taken for a right-of-way for a drainage ditch unless it is found that the lands to be drained are a source of disease, and that the draining of them will promote the public health, was enforced in New York prior to 1895.[11]

Other courts have adopted a more liberal policy and have held that the purpose of a work of land drainage is public if it involves sufficiently large tracts of land. Thus the supreme court of Massachusetts, in affirming the validity of a statute providing for the draining of certain lands along a river by the removal of a dam therein, against the objection that its purpose was not public, said: "The improvement of so large a territory, situated in several different towns and owned by a great number of persons, by draining off the water and thereby rendering the land suitable for tillage, which could not otherwise be usefully improved at all, would seem to come fairly within the scope of legislative action, and not to be so devoid of all public utility and advantage as to make it the duty of this court to pronounce a statute, which might well be designed to effect such

[10] 68 *Michigan*, 625, 628 (1888).

[11] Re Draining in Chili, 5 *Hun's New York*, 116 (1875); Re Ryers, 72 *New York*, 1 (1878); Burk *v.* Ayers, 19 *Hun's New York*, 17 (1879); Catlin *v.* Munn, 37 *Hun's New York*, 23 (1885).

Where proceedings were started in 1891 but not found to be for public health, the court held the ditch illegal on the ground that such finding was necessary, and that ch. 384 of the Laws of 1895, passed in pursuance of the amendment of January 1, 1895 as art. 1, sec. 7 of the constitution, and that amendment, were not retrospective in effect. The amendment was as follows: "General laws may be passed permitting the owners or occupants of agricultural lands to construct or maintain for the drainage thereof, necessary drains, ditches, and dykes upon the lands of others, under proper restrictions and with just compensation, but no special laws shall be enacted for such purposes."

a purpose, invalid and unconstitutional. The act would stand on a different ground, if it appeared that only a very few individuals or a small adjacent territory were to be benefited by the taking of private property. But such is not the case here. The advantages which may result from the removal of the obstruction caused by the plaintiff's dam are not local in their nature, nor intended to be confined to a single neighborhood. They are designed to embrace a large section of land lying in one of the most populous and highly cultivated portions of the State, and by increasing the productive capacity of the soil to confer a benefit, not only on the owners of the meadows, but on all those who will receive the incidental advantage arising from the development of the agricultural resources of so extensive a territory."[12] It has been held in New Jersey that the purpose of draining large districts of land lying within several counties of the state, embracing thousands of acres, is sufficiently public to justify the exercise of the power of eminent domain,[13] and in Indiana that a ditch will be of public benefit and utility if it will drain any considerable body of lands.[14] In North Carolina the supreme court has decided that an act making possible the drainage of thousands of acres of land located in a low portion of the state must be deemed of general and public utility.

Some of the courts have not limited the right to exercise the power of eminent domain for reclamation work to cases where large tracts of land are involved, but have held in effect that the amount of land to be benefited is not a proper test in determining whether or not the purpose of the work is public. Thus, the supreme court of North Carolina, at first holding that the amount of land involved was material,[15] in a later case said: "If the General Assembly has power to make regulations for draining a swamp containing 10,000 acres, it has the same power in regard to a swamp containing 1,000 acres. So of 100 acres, so of one acre. There is no distinction in the principle; the only difference is in regard to the degree."[16] The supreme court of Montana, in considering the validity of a law providing for the condemnation of a right of way for an irrigation ditch (the situation being analogous to that in drainage matters), said: "What real distinction is there, so far as the term 'public use' is concerned, between the benefit that results to a state from the reclamation by artificial irrigation of 160 acres of agricultural land owned by one or two persons, and the reclamation by the same means of thousands of acres owned by many different persons living together in one subdivision of the

[12] Talbot *v.* Hudson, 16 *Gray's Massachusetts*, 417, 424 (1860).

[13] Re Drainage between Lower Chatham, 35 *New Jersey Law*, 497 (1872); Re Drain on Pequest River, 39 *New Jersey Law*, 433 (1877); Tidewater Company *v.* Coster, 18 *New Jersey Equity*, 518 (1866).

[14] Zigler *v.* Menges, 121 *Indiana*, 99 (1889).

[15] Norfleet *v.* Cromwell, *supra*.

[16] Pool *v.* Trexler, 76 *North Carolina*, 297 (1877).

state? We do not think there is any in principle. The reclamation of one small field by means of artificial irrigation promotes the development and adds to the taxable wealth of the state as well as the reclamation by the same means of a number of fields. The only difference is the extent of the benefit."[17] In Washington it has been held that the construction of ditches for the drainage of land otherwise useless for agricultural purposes is a public one; and that it is not necessary that the public at large shall be benefited, but only that part of the public affected by want of proper drainage or by the improvement to be made.[18]

Although the prosperity of individuals may conduce to the welfare of the state, the courts have never considered the promotion of individual welfare as constituting a public purpose in connection with the exercise of the power of eminent domain.[19] Consequently courts sustaining drainage acts under that power have encountered difficulties when but small tracts of land were benefited or a few individuals and have evidently considered it easier to justify such laws by a reference to the broader and more indefinite police power.[20] Thus, the supreme court of North Carolina said: "The Legislature, in the exercise of the police powers of government, had authority to enact it (the drainage law) with a view to the promotion of the general welfare, and the mere fact that one or more individuals may derive from it peculiar and particular benefits and advantages, does not destroy in effect its validity."[21] And in Wisconsin, the court, after referring to the provisions of a drainage statute upon the constitutionality of which it was passing, said: "It requires but a casual examination of these provisions for the draining of the swamp and overflowed lands of the State to be apparent that such ditching and draining are for no public use whatever in the legal meaning of the term. The primary object is solely to restore such lands to a proper condition for tillage and agriculture by the several owners, and for their use alone. It enhances their value, intrinsic and in market. This is the only object which concerns their use, and that use is strictly private. The other object, and the only one mentioned in the law, is that such ditching, draining, and enlargement of drains will 'conduce to the public health or welfare.' It is clear that no private property is authorized by this law to be taken for the *public* use, and that whatever taxation so called or assessment, it is not an exaction of the government for revenue or for any public purpose. It follows that this system of drainage of the lands of private owners by special assessment of all of

[17] Ellinghouse *v.* Taylor, 19 *Montana*, 463, 464 (1897).
[18] Lewis County *v.* Gordon, 20 *Washington*, 80 (1898).
[19] *Supra*, page 34, note 5.
[20] Thus in Cribbs *v.* Benedict, 64 *Arkansas*, 555 (1897), the court said: "For the power of police is more comprehensive in its application, and the limitations upon its exercise are not so imperious and exacting (as of eminent domain)."
[21] Winslow *v.* Winslow, 95 *North Carolina*, 24 (1886).

them proportionably according to their respective *private* benefits, is not within the purview of any provision of the state constitution, and it cannot be sustained thereby. But there is a sovereign power in the State, to be exercised by the legislature which is outside, and in a sense above, the constitution called the *police* power of the State. . . . This legislation may readily be referred to this power by providing for the *public health*. If it were not for this obvious and clearly expressed purpose of the law, it could not be endured for a moment, because it would provide for a despotic and most unwarrantable interference with private property for strictly private *purposes* and *use*, in which neither the people of the State nor the State itself, nor the public, have any interest whatever."[22]

It is clear that the power of police is broader in its scope than that of eminent domain and therefore it is perhaps easier to sustain a drainage statute by a reference to the former emanation of sovereignty than the latter, but even where the act is based upon the police power there must also be a public purpose.[23] The recognition of this fact has caused some courts to use the possible benefit to public highways as one of the grounds for holding drainage laws sufficiently public in purpose to be constitutional.[24] Thus, an Ohio court held that it is not sufficient that a ditch will drain the lands adjacent to it, or enable the owners of adjacent lands to raise larger and better crops, but the public health, convenience, or welfare must in some way suffer for want of the ditch. The public convenience may be subserved by the fact that in times of freshets water which overflows turnpikes and bridges, will be carried away more rapidly and with less injury to such roads and bridges. If the construction of the ditch . . . . will result in the reclamation or bettering of a considerable quantity of low, wet or swampy lands, or drain stagnant ponds, thereby improving the public highways of the vicinity and the health of the community, and increasing the value of the land surrounding the ditch, it will be sufficiently conducive to the public health, convenience, or welfare to be sustained.[25]

It has generally been held that it is not necessary that all the people of the state should be directly affected by the drainage. It is sufficient if a particular community is benefited.[26] Thus, in Lake Erie and W. R. Co. *v.* Hancock County Commissioners, the supreme court of Ohio held that private property may be appropriated for a drainage ditch if it will be conducive to the public health, convenience, or welfare of the neighbor-

[22] Donnelly *v.* Decker, 58 *Wisconsin*, 461 (1883).

[23] Tiedeman, *Limitations on the Police Power*, 444.

[24] Smeaton *v.* Martin, 57 *Wisconsin*, 364 (1883); Heick *v.* Voight, 110 *Indiana*, 279 (1886); Anderson *v.* Baker, 98 *Indiana*, 587 (1884); Coster *v.* Tidewater Company, 18 *New Jersey Equity*, 518 (1866).

[25] Thomas *v.* County Commissioners, *Ohio Circuit and Common Pleas*, 449.

[26] Ross *v.* Davis, 97 *Indiana*, 79 (1884).

hood through which it is constructed, and that a more general necessity is not required.[27] It is the public health of the community to be affected by the proposed work, and not that of the public at large, that is to be regarded in determining the power of the legislature;[28] and that the works authorized to effect the drainage of land do not extend beyond a particular, and it may be a small, district does not prevent the purpose from being public.[29] If the drain is of public benefit, the fact that some individuals may be specially benefited over others affected by it will not deprive it of its public character.[30]

While there seems to be a tendency for the courts to shift the basis of the constitutional right of the state legislatures to enact general drainage laws from the rights of eminent domain and taxation to the broader ground of the police power, where such statutes may be justified because they promote the public benefit, welfare, and convenience; yet even there it is difficult in many cases to find a true public purpose for the acts within the established legal definition of the term "public." The judiciary have seen that drainage statutes are necessary and wise even though in their application to some cases only a few landowners may be benefited and the public benefit be non-existent; that without such laws less progressive landowners, by refusing to allow their more progressive neighbors to build ditches across their lands, could prevent the reclamation of swamps and marshes, and retard the development of the country; and have sustained drainage acts in many cases by referring to possible benefits to public highways, health, or convenience, which are really remote and uncertain, as lending a sufficient public character to justify such laws under the police power; but the public interest is clearly in many cases "rather a specious plea than a reality."[31] In a few instances, however, the courts have practically upheld the statutes by frankly referring to their necessity alone, so far as the real basis of their decisions is concerned. Thus Justice Peckham, speaking of the power of a legislature to authorize the drainage of swamp lands said in a comparatively recent decision: "The power does not rest simply upon the ground that the reclamation must be necessary for the public health. That indeed is one ground for interposition by the State, but not the only one. Statutes authorizing drainage of swamp lands have

[27] 63 *Ohio State*, 23 (1900).

[28] Chesbrough *v.* Putnam, 37 *Ohio State*, 508 (1862).

[29] Hartwell *v.* Armstrong, 19 *Barbour's New York Supreme Court*, 166 (1854); Re Ryers, 72 *New York*, 1 (1878).

[30] Talbot *v.* Hudson, 16 *Gray's Massachusetts*, 417, 425 (1860). "That this statute may be used (and probably is sometimes) for the purpose of promoting private interests in the name of 'public health and convenience', we need not stop to deny. It is enough for us to know that the principal object intended and authorized by the legislature was the public welfare; and that whenever private interests are promoted by the making of ditches, etc., they are merely incidental, when the statute is properly executed." Sessions *v.* Crinkilton, 20 *Ohio State*, 349 (1870). See also Ross *v.* Davis, 97 *Indiana*, 79 (1884).

[31] Freund, *Police Power* (ed. 1904), 469.

frequently been upheld independently of any effect upon the public health, as *reasonable regulations for the general advantage of those who are treated for this purpose as owners of common property.*"[32] And some time before this Judge Cooley had written: "If it be essential or material for the prosperity of the community, and if the improvement be one in which all the landowners have to a certain extent a common interest, and the improvement can not be accomplished without the concurrence of all or nearly all of such owners by reason of the peculiar natural condition of the tract sought to be reclaimed, then such reclamation may be made, and the land rendered useful to all, and at their joint expense. In such case the absolute right of each individual owner of land must yield to a certain extent or be modified by corresponding rights on the part of other owners for what is declared upon the whole to be for the public benefit."[33] In other words, this basis for sustaining drainage laws might be said to be an application in a negative manner of the old maxim, "sic utere tuo ut alienum non laedas."[34] It might well be contended that at least the beginnings have been laid down for a rule to the effect that one should not refuse or neglect to use or improve his own land, when such non-user will prevent others from using or improving their land or property.[35]

It will be noted later that in some of the states on the eastern coast of the United States the drainage laws do not state that they are for a public purpose, nor do they require any finding that a proposed work of reclamation is of public benefit or utility. The courts in these states have therefore been precluded from relying upon even the broadest application of the theory of the police power to sustain their statutes; but the latter were enacted as early as 1701 if not earlier, and were not called in question for such a long period of time that the doctrine of stare decisis could be appealed to as authority for upholding them. It is true that in these cases, as in others where laws authorized the exercise of the power of eminent domain for purposes really private, such courts have sometimes said that such private statutes could not be held constitutional merely because they had been acquiesced in for a great number of years;[36] but nevertheless similar private acts have been declared valid because of the doctrine of stare decisis in many cases, particularly those relating to pri-

[32] Fallbrook Irrigation District *v.* Bradley, 164 *United States*, 112, 163 (1896).

[33] Cooley, *Taxation* (2d ed.), 617.

[34] Note expression of court in Donnelly *v.* Decker, 58 *Wisconsin*, 461, 472 (1883).

[35] This justification of the statutes, and the effect of stare decisis, might perhaps be said to constitute two exceptions to the oft repeated rule that no indirect benefits to the public resulting from a benefit to private persons, can constitute a "public" benefit or purpose in the legal sense of the term. (See following paragraphs on stare decisis.)

[36] Hartwell *v.* Armstrong, 19 *Barbour's New York Supreme Court*, 166, 170 (1854); Sadler *v.* Langham, 34 *Alabama*, 311 (1859).

va'e roads[37] and the flowage of lands for grist mills.[38] Indeed, many statutes providing for the exercise of the power of eminent domain for uses of at least doubtful publicity were enacted by colonial legislatures prior to the American Revolution or the adoption of state constitutions, such as the mill-dam acts of 1667, 1714, 1718, 1719, 1719, 1734, and 1758, in Virginia, Massachusetts, New Hampshire, Delaware, Maryland, Rhode Island, and North Carolina respectively,[39] the private-road acts of 1735-36 in Pennsylvania,[40] and a Tennessee grist-mill law of 1777.[41] Statutes of this character were enacted, and their validity in some cases passed upon,[42] before the adoption of inconsistent provisions in state constitutions. Of course the latter would displace existing conflicting legislation but a retroactive force might be avoided[43] on the theory that, if the people had intended to prevent their legislatures from passing statutes common at the

[37] Hickman's Case, 4 *Harrington's Delaware*, 580 (1847); Palairet's Appeal, 67 *Pennsylvania*, 479 (dictum) (1871); but see Lewis, *Eminent Domain*, sec. 167 and cases cited therein.

[38] Hankins *v.* Lawrence, 8 *Blackford's Indiana*, 266 (1846); Fleming *v.* Hull, 73 *Iowa*, 598, 602 (1887); Burnham *v.* Thompson, 35 *Iowa*, 421 (1872); Olmstead *v.* Camp, 33 *Connecticut*, 532 (1866); McMillan *v.* Noyes, 75 *New Hampshire*, 258 (1909); Miller *v.* Troost, 14 *Minnesota*, 365 (*Gilfillan*, 282) (1869); Fisher *v.* Horicon Iron Company, 10 *Wisconsin*, 351 (1860); Kepley *v.* Taylor, 1 *Blackford's Indiana*, 492 (1819); Todd *v.* Austin, 34 *Connecticut*, 78 (1867); Occum Company *v.* Sprague Manufacturing Company, 35 *Connecticut*, 496, 511 (1868); Boston and Roxbury Mill Company *v.* Newman, 12 *Pickering's Massachusetts*, 467 (1832); Hazen *v.* Essex Company, 12 *Cushing's Massachusetts*, 475 (1853); Murdock *v.* Stickney, 8 *Cushing's Massachusetts*, 113 (1851); Jordan *v.* Woodward, 40 *Maine*, 317 (1855); Great Falls Manufacturing Company *v.* Fernald, 47 *New Hampshire*, 444 (1867); Amoskeag Manufacturing Company *v.* Head, 56 *New Hampshire*, 386 (1876); Ash *v.* Cummings, 50 *New Hampshire*, 591 (1872); Amoskeag Manufacturing Company *v.* Worcester, 60 *New Hampshire*, 522 (1881); Amoskeag Manufacturing Company *v.* Godale, 62 *New Hampshire*, 66 (1882); Head *v.* Amoskeag Manufacturing Company, 113 *United States*, 9 (1885); Scudder *v.* Trenton Delaware Falls Company, 1 *New Jersey Equity*, 694, 726 (1832); Venard *v.* Cross, 8 *Kansas*, 248, 261 (1871); Harding *v.* Funk, 8 *Kansas*, 315, 323 (1871); Traver *v.* Merrick County, 14 *Nebraska*, 327 (1883); Cooley, *Constitutional Limitations* (6th ed.), 657-661; *Angell on Watercourses* (7th ed.), 487; Lewis, *Eminent Domain* (2d ed.), sec. 180 *et seq.*

[39] The following list gives first the year of the adoption of the *earliest state constitution* and the references to mill-dam acts passed prior thereto. For references to other early acts of the same nature, see note to Head *v.* Amoskeag Manufacturing Company, 113 *United States*, 17.

Virginia (1776); *Colonial Statutes*, 1667, ch. 4, *2 Hening's Statutes*, 260; *Colonial Statutes*, 1705, ch. 41, *3 Hening's Statutes*, 401.

Massachusetts (1780): *Provincial Statutes*, 1714, ch. 15, 1 *Provincial Laws* (State ed.), 729, and *Ancient Charters*, 404.

New Hampshire (1776): *Provincial Statutes*, 1718, *Provincial Laws* (1771 ed.), ch. 60.

Maryland (1776): *Provincial Statutes*, 1719, ch. 15; *Bacon's Laws*, 1765, and 1 *Kilty's Laws*.

Delaware (1776): *Provincial Statutes*, 1719, 1760, 1773, 1 *Laws* 1700-1797, p. 535, app. 53.

Rhode Island (1842): *Colonial Statutes*, 1734; *Laws*, 1744, p. 180; *Public Laws*, 1798, p. 504.

North Carolina (1776): *Provincial Statutes*, 1758, ch. 5, *Revision*, 1773, p. 219.

[40] Palairet's Appeal, 67 *Pennsylvania*, 479 (1871). Act not attacked for 115 years.

[41] Harding *v.* Goodlet, 3 *Yerger's Tennessee*, 40 (1832). New York private road act of 1772 was declared void as conflicting with constitution of 1777 in Taylor *v.* Porter, 4 *Hill's New York* 142 (1843), but Chief Justice Nelson dissented on the ground of stare decisis, saying that the act had not been called in question for over seventy years.

[42] Hepburn's Case, 3 *Bland's Maryland Chancery*, 95; Wilkinson *v.* Leland, 2 *Peter's United States Supreme Court*, 627. Constitution of Rhode Island, 1843. See also Tyler *v.* Beacher, 44 *Vermont*, 648 (1871).

[43] Wilkins *v.* Jewett, 139 *Massachusetts*, 29; 8 *Cyclopedia of Law and Procedure*, 747; 6 *American and English Encyclopaedia of Law*, 919; Cooley, *Constitutional Limitations* (6th ed.), 77; Black, *Interpretation of Laws* (2d ed.), 26.

time of the making of such constitutions, they would have embodied in their organic laws express prohibitions against laws of the character of the private-road and grist-mill acts.[44]

Following decisions upholding private-road and mill-dam acts which had long been acquiesced in and enacted prior to 1800, the supreme court of New Jersey has affirmed the validity of drainage acts of that state which were really private in character. Thus, in the case of Coster *v.* Tidewater Company such a statute was upheld[45] against the objection that it authorized the taking of private property for a private purpose. The court referred its decision to the "power of the government to prescribe public regulations for the better and more economical management of property of persons whose property adjoins, or which, for some other reason, can be better managed and improved by some joint operation, such as the power of regulating the building of party walls; making and maintaining partition fences and ditches; constructing ditches and sewers for the draining of uplands or marshes, which can more advantageously be drained by a common sewer or ditch. This is a well known legislative power," said the court, "recognized and treated by all juriconsults and writers upon law through the civilized world."[46] And in a leading case upon the constitutionality of such drainage acts, the New Jersey statute of March 8, 1871, with its supplement of March 19, 1874, was declared within the sphere of legitimate legislation by the supreme court of that state. This was on the theory that the right of the legislature, though obviously not resting in the powers of eminent domain or of taxation, and derogatory to private property rights by compelling the private owner to suffer, and pay for the improvement of his property because other contiguous owners desired so to improve theirs, and not to be justified on first principles, had nevertheless become established as a sort of local common law by legislative and judicial and popular recognition for nearly a century, and that it must now be regarded as legitimate legislation.[47] This position was affirmed by the United States Supreme Court, which, speaking through Justice Gray, said: "General laws for the drainage of large tracts of swamp and low lands, upon proceedings instituted by some of the proprietors of the lands to compel all to contribute to the expense of their drainage, have been maintained by the courts of New Jersey (without reference to the power of taking private property for the public use under the right of eminent domain, or to the power of

[44] Justice Brewer in Venard *v.* Cross, 8 *Kansas*, 248, 262 (1871).

[45] The act, however, was declared unconstitutional because of an improper method of making assessments.

[46] 3 *C. E. Green's New Jersey Chancery*, 54, 68, 516 (1866).

[47] Hoagland *v.* Wurts, 41 *New Jersey Law*, 175 (1879). Explained and followed in 42 *New Jersey Law* 553; 45 *New Jersey Equity*, 94; 68 *New Jersey Law*, 199; 80 *New Jersey Law*, 268 and 648; 46 *New Jersey Equity*, 441; 65 *New Jersey Equity*, 629. The decision held that the purpose of the act was public, but that it must be considered void because departing from an ancient custom as to manner of making assessments.

suppressing a nuisance dangerous to the public health) as a just and constitutional exercise of the power of the legislature to establish regulations by which adjoining lands, held by various owners in severalty, and in the improvement of which all have a common interest, but which, by reason of the peculiar natural condition of the whole tract, can not be improved or enjoyed by any of them, without the concurrence of all, may be reclaimed and made useful to all at their joint expense. The case comes within the principle upon which this court upheld the validity of the general mill acts in Head *v.* Amoskeag Manufacturing Company, 113 *United States,* 9."[48]

Thus, the constitutional right of the legislatures of the states to enact general drainage laws has been affirmed, and the argument that they authorize the confiscation or taking of private property for private purposes has been refuted by referring to the powers of eminent domain, taxation, and police, the doctrine of stare decisis, and the necessity and wisdom of such statutes as conducive to the improvement of lands by more enterprising owners.

But the constitutionality of such acts has been vigorously assailed in the courts, not only on the ground that their object is merely private gain and therefore that they are beyond the scope of legitimate legislative authority, but also for reasons peculiar to particular statutes or constitutions, such as that the act is defective as to title, superseded by later acts, special legislation, or violating prohibition of state aid to internal improvements. Furthermore, the laws in question have been said to violate constitutional provisions relating to the separation of the powers of government into three distinct departments, executive, legislative, and judicial. Such provisions are common, and it is often further expressly stated in the organic laws of the states that no one of the three departments or its officers shall exercise any of the functions properly belonging to another.[49] The attacks upon drainage statutes on this ground have arisen most frequently in connection with acts requiring or providing for the participation of judicial officers in hearings, their appointment of viewers or commissioners, and the making of ditch orders by them. These attacks have raised two distinct issues. In the first place, the question has arisen as to whether the acts in question really do impose non-judicial duties upon the courts, and thus violate the principle of a separation of powers. And in the second place, it has been necessary for the courts to consider the question as to whether the constitutional provisions relating to distinct departments of government are applicable to such cases as this, that is, to the carrying on of drainage works. These two issues can not well be satisfactorily discussed by a mere reference to drainage cases,

[48] 114 *United States,* 610, 613 (1884).

[49] For example, Minnesota Constitution, art. 3; Alabama Constitution, art. 3, sec. 2; Maine Constitution, art. 3, sec. 1; Michigan Constitution, art. 3, sec. 2; Mississippi Constitution, art. 3, sec. 2.

since they are comparatively few in number, and as a rule are unsatisfactory in their treatment of the subject, so that it will be necessary to refer to some of the broad principles that have been laid down by the courts with reference to the doctrine of the separation of powers in decisions on matters other than the reclamation of swamp lands through public action.

The general principle of law is well established that the legislature can not impose upon the judiciary any duties or confer upon it any powers that are non-judicial in character.[50] The term "judicial power" includes both the power to determine controversies[51] and to interpret laws;[52] and it is to be distinguished on the one side from the power to execute, administer, or enforce, the laws, and on the other side from the power to lay down in advance of the occurrence of the acts to which they relate, general rules of conduct. The legislature is to make the law; the executive, to carry it out; the judiciary, to apply it to particular cases. The fundamental principle of the separation of powers is easily stated; but, as is always the case when the abstract and general is to be applied to the concrete and particular, the courts have met with difficulties in testing the constitutionality of given statutes as to the division of governmental departments. They have been forced to concede that in practice it is not only inadvisable in many cases, but even impossible, to enforce a strictly logical separation of functions.[53] Partly because of this difficulty, and partly because of political reasons or the influence of public opinion, there can not be said to be uniformity in the application of the general rule that non-judicial functions can not be imposed upon the judiciary. In some cases it would seem that the courts have recognized a desire on the part of the people to have certain matters

[50] 8 *Cyclopedia of Law and Procedure*, 844. In Minnesota, see Minnesota Constitution, art. 3, sec. 1; State *v.* Brill, 100 *Minnesota*, 499 (1907); State *v.* Bates, 96 *Minnesota*, 110 (1905); McGee *v.* Hennepin County, 84 *Minnesota*, 472 (1907); State *v.* Crosby, 92 *Minnesota*, 176 (1904); In re Application of Senate, 10 *Minnesota*, 78 (1865); Rice *v.* Austin, 19 *Minnesota*, 103 (1872); State *v.* Young, 29 *Minnesota*, 474, 552 (1881); McConaughy *v.* Secretary of State, 106 *Minnesota*, 392, 414 (1909); State *v.* Dike, 20 *Minnesota*, 363 (1873-74).

[51] Taylor *v.* Place, 4 *Rhode Island*, 324, (1856); Merrill *v.* Sherburne, 1 *New Hampshire*, 199, 204 (1818).

[52] State *v.* Denny, 118 *Indiana*, 382, 388 (1888); Wolfe *v.* McCaull, 76 *Virginia*, 876 (1882); 6 *American and English Encyclopaedia of Law*, 1053.

[53] Goodnow, *Comparative Administrative Law*, 20; Wilson, *Congressional Government*, 285, 306; Stevens, *Sources of the Constitution of the United States*, 47; Von Holst, *Constitutional Law of the United States*, 67, 68; Cooley, *Constitutional Law*, 44; Story, *Commentaries on the Constitution of the United States*, sec. 525; 2 Hare, *American Constitutional Law*, 850; Livingston *v.* Moore, 1 *Baldwin's United States Circuit Court*, 449; Brown *v.* Turner, 70 *North Carolina*, 93, 102 (1874).

In Minnesota the court has held that the exercise of judicial functions may involve the performance of legislative or administrative duties, and vice versa; State *v.* Dunn, 86 *Minnesota*, 301, 304 (1902); Minnesota Sugar Company *v.* Iverson, 91 *Minnesota*, 30, 34 (1903); Rockwell *v.* Fillmore County, 47 *Minnesota*, 219 (1881); Home Insurance Company v. Flint, 13 *Minnesota*, 244 (1862); State *v.* Iverson, 92 *Minnesota*, 355, 362 (1904). See also as to nature of judicial inquiry, Prentis *v.* Atlantic Coast Line, 211 *United States*, 210 (1908); State *v.* Probate Court, 112 *Minnesota*, 279 (1910); and that there are many duties which may be either judicial or ministerial, depending on the officer or body performing them, and the effect to be given to their action or determination, Foreman *v.* Hennepin County, 64 *Minnesota*, 371 (1896).

controlled by a court which they may deem less influenced by partisan or personal motives than the other departments of the government; and in other decisions it would appear probable that the judiciary were merely unwilling to assume additional duties which they might avoid by a more strict application of the doctrine of separation to the facts involved. Cases that may throw some light upon the validity of drainage acts that require action by the courts by parity of reasoning or similarity in facts, are those in which it has been held that judges might be authorized to fix the salaries of deputy county officers;[54] that a county judge can not be endowed with the right of designating the time and place of elections[55] (of interest in reference to laws relating to formation of drainage districts after election on the question); that courts can not exercise the power to create municipal corporations;[56] that they can not be required to pass upon claims in non-judicial proceedings;[57] and, on the other hand, that even the salaries of court reporters can not be fixed by the judges.[58] It has been held that a statute empowering a circuit judge to issue a certificate of incorporation after determining that the proper steps have been taken is valid;[59] and so is one that imposes upon certain judges the duty of fixing the boundaries of a sanitary district.[60] In Minnesota it has been held that a duty may involve the exercise of judicial and legislative or administrative functions so connected that they can not well be separated; that in such cases the legislature in its discretion may impose the duty upon the judiciary, and that the courts will presume that the legislature intended that the duty should be performed in a judicial manner;[61] and statutes have been sustained authorizing the district courts to establish drainage districts[62] and roads;[63] to determine whether assessing officers have correctly determined the facts on which assessments for local improvements are made;[64] to appoint examiners of title under the Torrens law;[65] to fix the salaries of

[54] Stone *v.* Wilson, 19 *Kentucky Law*, 126 (1897).

[55] Dickey *v.* Hurlburt, 5 *California*, 343 (1855).

[56] People *v.* Nevada, 6 *California*, 143 (1850); Shumway *v.* Bennett, 29 *Michigan*, 451 (1874). But as to conflict on this point, see McQuillen, *Municipal Corporations*, secs. 136, 137, 139; Dillion, *Municipal Corporations* (5th ed.), 107 *et seq.*; State *v.* Simons, 32 *Minnesota*, 540 (1884) holds court can not incorporate.

[57] United States *v.* Ferreira, 13 *Howard's United States Supreme Court*, 39 (1851).

[58] Smith *v.* Strother, 68 *California*, 194 (1885).

[59] Elder *v.* Central City, 40 *West Virginia*, 222 (1895); In re Union Mines, 39 *West Virginia*, 179 (1894).

[60] People *v.* Nelson, 133 *Illinois*, 565 (1890).

[61] Foreman *v.* Hennepin County, 64 *Minnesota*, 371 (1896); McGee *v.* Hennepin County, 84 *Minnesota*, 472 (1901); State *v.* Crosby, 92 *Minnesota*, 176, 180 (1904); State *v.* Bates, 96 *Minnesota*, 110 (1905).

[62] State *v.* Crosby, 92 *Minnesota*. 176 (1904) and see p. 56 *infra*. In State *v.* Bates, 96 *Minnesota*, 110, 116 (1905) the court said that when legislative, executive, and judicial functions were closely interwoven it would "not attempt to unravel the combination."

[63] State *v.* McDonald, 26 *Minnesota*, 445 (1880).

[64] State *v.* Ensign, 55 *Minnesota*, 278 (1893).

[65] State *v.* Westfall, 85 *Minnesota*, 437 (1902).

county attorneys;[66] to approve the bonds of applicants for liquor licenses.[67]

It will be noted later on that in many states the general drainage acts require the judges of county or district courts to appoint certain officers to act in public ditch proceedings, so that it should be noticed that there is some conflict of authority in the United States on the question as to whether statutes conferring upon the judiciary the power of appointment are unconstitutional as violative of the rule as to separation of functions. The weight of authority, however, upholds such laws, and this is the rule in the courts of the United States, and of Alabama, California, Colorado, Georgia, Illinois, Indiana, Kentucky, New Jersey, New York, Oregon, Pennsylvania, Texas, West Virginia, and Wisconsin.[68] The reasoning of these courts in some cases depends on the character of the appointee, as that he is an officer of the court, as in cases of jury commissioners, or court reporters, or court janitors;[69] or that the appointment of commissioners to borrow money and dispose of bonds involves the exercise of discretion and judgment and is a judicial act.[70] Other cases hold that the appointing power is neither exclusive nor inherent in the executive department, and that therefore it is not an executive function unless expressly made so by organic law or by statute; and that in the absence of such provision it may be exercised by the courts just as well as by the legislative or executive branches.[71] In Illinois a law requiring the appointment of election commissioners by the county court was upheld in part on the theory that the duties to be performed by such commissioners were of a judicial nature since they were to consider evidence, and decide whether the election judges had improperly refused registration;[72] and in some states statutes have been held valid in part because of practical construction.[73] And on the theory that commissioners to adjust and settle matters of indebtedness between counties are in the nature of arbitrators or referees, and consequently judicial in character, it has been decided that the courts may be authorized to appoint them.[74] But there are many other cases in which appointments have been held proper, which can not be sustained upon the principle that the ap-

[66] Rockwell *v.* Fillmore County, 47 *Minnesota*, 219 (1891).

[67] State *v.* Bates, 96 *Minnesota*, 110 (1905).

[68] For cases see note in 6 *American and English Encyclopaedia of Law*, 1060; the following cases cited herein; Goodnow, *Principles of the Administrative Law of the United States*, 40; and 29 *Cyclopedia of Law and Procedure*, 1369.

[69] Stevens *v.* Truman, 127 *California*, 155 (1899); State *v.* Mounts, 36 *West Virginia*, 179 (1892); Matter of Janitor, 35 *Wisconsin*, 410 (1874); State *v.* Noble, 118 *Indiana*, 350 (1888); State *v.* Kendle, 52 *Ohio State*, 346 (1895); White County *v.* Gwin, 136 *Indiana*, 562 (1893).

[70] Sweet *v.* Gwin, 136 *Indiana*, 562 (1893).

[71] Fox *v.* McDonald, 101 *Alabama*, 51 (1892); People *v.* Morgan, 90 *Illinois*, 558, 562 (1878); 29 *Cyclopedia of Law and Procedure*, 1369.

[72] People *v.* Hoffman, 116 *Illinois*, 587 (1886).

[73] Russell *v.* Cooley, 69 *Georgia*, 215 (1882); Terre Haute *v.* Evansville, 149 *Indiana*, 174 (1897).

[74] Tuolumne County *v.* Stanislaus County, 6 *California*, 440 (1856). See People *v.* Provines, 34 *California*, 531 (1868) for criticism of reasoning in this case though not of the result.

pointees are in the nature of officers or agents of the judiciary. Such decisions are those holding that courts may be authorized to appoint election boards or inspectors,[75] police[76] and park commissioners,[77] appraisers of damages from the opening of streets,[78] tax collectors,[79] school commissioners,[80] tax equalizers,[81] commissioners or trustees to carry on the construction of a subsidized railroad,[82] a resident of a county to take charge of and confine an insane person,[83] members of a board of children's guardians,[84] excise[85] and bridge commissioners.[86]

Although it may be said, therefore, that the weight of judicial authority in the United States sustains statutes authorizing the exercise of appointive powers by the courts, yet in Connecticut, Indiana, Iowa, Maryland, Michigan, Montana, North Carolina, and Massachusetts a contrary doctrine has been declared on the theory that appointment to office is an executive function and can not be imposed upon, or delegated to, the judicial department of government.[87]

In Minnesota a statute conferring upon the district courts of the state the power to appoint examiners of titles under the Torrens law, was upheld by the supreme court. Chief Justice Start, speaking for the court, said: "The examiners provided for by this act are subordinate officers or assistants of the courts, to aid them in the discharge of the judicial duties imposed upon them by the act. It was therefore competent and proper for the

[75] Russell *v.* Cooley, 69 *Georgia,* 215 (1882); Ford *v.* North Des Moines, 80 *Iowa,* 626 (1890); Ex parte Siebold, 100 *United States,* 371 (1879); Sundry Citizens, *2 Flippin's United States Circuit Court,* 228 (1878). See also McDonald *v.* Morrow, 119 *North Carolina,* 666 (1896) to the effect that judges may be required to exercise supervision over election clerks.

[76] Staude *v.* Election Commissioners, 61 *California,* 313 (1882).

[77] Cornell *v.* People, 107 *Illinois,* 372 (1883); People *v.* Williams, 51 *Illinois,* 63 (1869); People *v.* Morgan, 90 *Illinois,* 558 (1878); Ross *v.* Freeholders, 69 *New Jersey Law,* 291 (1903).

[78] Terre Haute *v.* Evansville, 149 *Indiana* 174 (1897); Solem Turnpike Company *v.* Essex County, 100 *Massachusetts,* 282 (1868).

[79] Hoke *v.* Field, 10 *Bush's Kentucky,* 144 (1873).

[80] Johnson *v.* DeHart, 9 *Bush's Kentucky,* 640 (1873).

[81] New Jersey Zinc Company *v.* Board of Equalization, 70 *New Jersey Law,* 186 (1903); State *v.* Myers, 52 *Wisconsin,* 628 (1881); Commonwealth *v.* Collier, 213 *Pennsylvania State,* 138 (1905).

[82] Sweet *v.* Holbert, 51 *Barbour's New York Supreme Court,* 312 (1868); Walker *v.* Cincinnati, 21 *Ohio State,* 14 (1871).

[83] Madison County *v.* Moore, 161 *Indiana,* 426 (1903).

[84] Wilkinson *v.* Children's Guardians, 158 *Indiana,* 1 (1902).

[85] Schwarz *v.* Dover, 70 *New Jersey Law,* 502 (1904).

[86] State *v.* George, 22 *Oregon,* 142 (1896). See also Board of County Commissioners *v.* State, 147 *Indiana,* 476 (1896) to the effect that courts may be required to perform certain duties as to relocation of county seats.

[87] State *v.* Barbour, 53 *Connecticut,* 76, 85 (1895) Evansville *v.* State, 118 *Indiana,* 426 (1888); People *v.* McKee, 68 *North Carolina,* 429 (1873); Taylor *v.* Commonwealth, 3 *J. J. Marshall's Kentucky,* 401 (1830); Heinlen *v.* Sullivan, 64 *California,* 378 (1883); State *v.* Washburn, 167 *Missouri,* 680 (1902); but see Johnson *v.* De Hart, 9 *Bush's Kentucky,* 640 (1873); Supervisors of Election, 114 *Massachusetts,* 247 (1873); Houseman *v.* Kent Circuit Judge, 58 *Michigan,* 364 (1885), but constitution of Michigan, art. VI, sec. 10, expressly prohibits exercise of appointive powers by judges except in a few cases. In Beasly *v.* Ridout, 94 *Maryland,* 641, 659 (1902) quoting Robery *v.* Prince George's County, 92 *Maryland,* 150 (1900), the court says: "The mere fact that a judge is called on by statute to execute a certain function, does not make it a judicial function. Its character is dependent on its qualities, not on the mere accident as to the person designated to do it."

legislature to provide for their appointment by the courts, as much so as would be a statute authorizing them to appoint a stenographer or a receiver in insolvency. . . . . The registration is the act of the court. The fact that it may be done by the registrar, under general orders, where there is no question, is not different from the power of the clerk to enter judgment, in cases ripe for judgment, under a general order or rule of the court."[88] The only case in the state, however, which led to a thorough judicial discussion of the doctrine of the separation of powers and the exercise of appointive functions by the courts, is that of State *v.* Brill, which was decided in 1907. In that case the court held unconstitutional an act of the legislature which empowered and required the judges of the district court of Ramsey County to appoint a board of control to have charge of the almshouse and hospital of that county and for the city of St. Paul. In an elaborate opinion by Justice Eliott, which is one of the leading judicial discussions of the question, it was pointed out that the doctrine of separation of powers is well established under both federal and state constitutions, the history of the development of the theory was traced, and it was said that "The tendency to sacrifice established principles of constitutional government in order to secure centralized control and high efficiency in administration may easily be carried so far as to endanger the very foundations upon which our system of government rests.[89] . . . . Although there are some decisions to the contrary, it is generally conceded that the power to appoint to a public office is in its nature an executive function, ... [although] there are some exceptions which are necessary in order that the several departments may exercise their express powers and functions without embarrassment, ... [such as] the appointment of subordinate officers and employees immediately connected with the court."[90] The supreme court held that this board was administrative in character, entirely disconnected from the judiciary, and that if the courts could be required to appoint its members, they could be compelled, under the same principle, to appoint a mayor, members of the board of public works, a chief of police, all other city and county officers; and the highest court in Minnesota could be required to appoint the state board of control, bank examiner, the regents of the state university, and other state boards and commissions. The judiciary could then be compelled to supervise its appointees, remove them, investigate their actions, report concerning their administration, and even administer the department itself, and thus to render nugatory the constitutional prohibition, and entirely revolutionize the system of government.[91]

[88] State *v.* Westfall, 85 *Minnesota*, 437, 446 (1902).
[89] State *v.* Brill, 100 *Minnesota*, 499, 502 (1907).
[90] *Ibid.*, 525.
[91] *Ibid.*, 499.

The question of the exercise of appointive powers by the courts does not appear to have been directly passed upon or discussed in reported decisions, with express reference to drainage laws. In Illinois the validity of such statutes has been practically assumed without judicial comment or discussion;[92] in Minnesota, as we shall later indicate, a judicial ditch act was held not violative of the constitutional provision for separation of departments, but little or no attention was paid to the appointive feature of the statute.[93] As to the tripartite theory and the supervisory authority of the judiciary in public ditch proceedings, as distinguished from its appointive authority, there is nearly an equal paucity of judicial discussion that is not dicta or beside the point. One Minnesota case squarely decides that such court supervision may be compelled or authorized, and perhaps Indiana and Illinois may be said to have considered the question, and to have come to the same conclusion, but it is doubtful whether they can be cited as plainly supporting the proposition.[94] Indeed, it seems that statutes providing ditch proceedings under the supervision of courts, are chiefly sustainable by arguments from analogy with reference to cases heretofore cited, and to the old established and well-recognized practice of using the judiciary in the establishment of railroads and highways under the power of eminent domain.[95]

From the foregoing discussion it appears that a carefully drawn drainage statute will generally be sustained against the objection that it violates constitutional provisions requiring a separation of governmental powers in that it requires the courts to appoint drainage officers, or to supervise proceedings for the establishment of public ditches. This is upon the theory that the duties imposed are not strictly non-judicial in character; but it might well be argued that even *were* such duties non-judicial, still the acts would be valid on the ground that the constitutional provisions relating to distinct departments are not applicable to work done by, or to functions of, the county or similar public corporation or drainage district, as distinguished from the state itself. This argument need not be based upon any position to the effect that drainage work is not a function of the state government itself, but of its local subdivisions, nor is it necessary to enter into

[92] Blake *v.* People, 109 *Illinois*, 504 (1884); Kilgour *v.* Drainage District, 111 *Illinois*, 342 (1884); Huston *v.* Clark, 112 *Illinois*, 344 (1884); Owners of Lands *v.* People, 113 *Illinois*, 296 (1885).

[93] State *v.* Crosby, 92 *Minnesota*, 176 (1904).

[94] People *v.* Nelson, 133 *Illinois*, 565, 600 (1890); Scott *v.* Brackett, 89 *Indiana*, 413 (1883). See also Bryant *v.* Robbins, 70 *Wisconsin*, 258, 270 (1887).

[95] Citizens' Saving Bank *v.* Town of Greenburgh, 173 *New York*, 215 (1903); Tyson *v.* Washington County, 78 *Nebraska*, 211 (1907); 10 *American and English Encyclopaedia of Law*, 1069 *et seq.*; Lewis, *Eminent Domain* (3d ed.), 739; note in 22 *Lawyers Reports Annotated, New Series*, 1. In Minnesota, see Re St. Paul and Northern Pacific Railway Companies, 34 *Minnesota*, 227 (1885); Stewart *v.* Great Northern Railway Company, 65 *Minnesota*, 515 (1896); Fohl *v.* Sleepy Eye Lake, 80 *Minnesota*, 67 (1900); Minneapolis and Saint Louis Railway Company, *v.* Hartland, 85, *Minnesota*, 76 (1901); Dunnell, *Minnesota Digest*, secs. 3027, 3080, 3094 *et seq.*; and especially McGee *v.* Hennepin County, 84 *Minnesota*, 472 (1901).

that domain of controversy as to whether or not a county or municipal officer in a given case (here that of drainage work) is acting as an agent of the state and as an officer of its central government, or merely as a representative of a public corporation.[96] Indeed, that question has not received much of any attention in the decisions relating to the constitutionality of drain statutes.[97] It is sufficient to take the position that the application of the distributive clause is confined to what is clearly within the sphere of the central government, and to those persons who are clearly and unmistakably its immediate officers. While it is true that there are only a few decisions expressly and squarely supporting this view, there are apparently none to the contrary; and whether or not the courts have in theory as a rule recognized the fact, it is certain that in practice the doctrine of separation has not been applied to counties or to municipal corporations with any degree of strictness or consistency.[98] In county government it has been common for the county boards to exercise mixed functions; to make contracts,[99] provide public buildings,[100] see to the construction of bridges,[101] and highways,[102] manage county funds,[103] control liquor licenses,[104] pass upon claims,[105] and sometimes to levy and collect taxes.[106] In short, a careful separation of powers has not been required by the courts, nor the merger of functions seriously questioned in county affairs. And so in the case of municipal corporations, in the narrow sense of the term, it has been held that the principle of separation should be confined in its application to the departments of the state government, and not extended to those of public corporations such as the city. All the legislative power of the state itself is vested in the legislature, which in the absence of constitutional restraints upon its right to organize municipal corporations, may, in the exercise of its discretion, and so far as the doctrine of separation is concerned, provide for any form of city government, and may vest legislative, judicial, or executive functions in one and the same person or authority.[107] Although this

[96] See 20 *American and English Encyclopaedia of Law*, 1223; Dillon, *Municipal Corporations*, secs. 97, 102, 390.

[97] State *v.* Flower, 49 *Louisiana Annual*, 1199 (1897).

[98] People *v.* Provines, 34 *California*, 520 (1868); discussion *infra;* Staude *v.* Election Commissioners, 61 *California*, 313 (1882); Fox *v.* McDonald, 101 *Alabama*, 51 (1892); 6 *American and English Encyclopaedia of Law*, 1008.

[99] Mitchell *v.* St. Louis County, 24 *Minnesota*, 459 (1878); 7 *American and English Encyclopaedia of Law*, 989 and cases cited therein.

[100] 7 *American and English Encyclopaedia of Law*, 996 and cases cited therein.

[101] *Ibid.*, 997.

[102] *Ibid.*, 999.

[103] *Ibid.*, 1001.

[104] *Ibid.*, 1002.

[105] *Ibid.*, 1003.

[106] *Ibid.*, 1002.

[107] State *v.* Barker, 116 *Iowa*, 96, 89 *Northwestern*, 204, especially at page 208 in *Northwestern;* cases cited hereafter; Cooley, *Constitutional Limitations*, 133; Smith, *Corporations*, sec. 153; 20 *American and English Encyclopaedia of Law*, 1223.

rule seems to have been followed in practice in the United States even from colonial times, and to be generally recognized, yet that recognition is almost entirely a tacit one, and the question has not been the subject of much discussion in adjudicated cases.[108] It has been held that constitutional prohibitions of a merger of functions do not render invalid statutes authorizing or requiring mayors or town clerks to act as justices of the peace;[109] for "from time immemorial similar powers have been conferred upon mayors of cities."[110] Likewise it has been decided that the police judge of a city may constitutionally be compelled by statute to notify the county attorney of violations of the prohibitory liquor laws of the state, and furnish the latter with the names of witnesses to such offences; such decision was upon the theory clearly stated that the provisions of the organic law relating to distinct governmental departments did not apply to municipal authorities or governments.[111] This rule as to non-applicability has been more explicitly stated in cases affirming the constitutionality of city charters providing a commission form of municipal government. Thus, the supreme court of Iowa in 1908 held valid the statute of that state which related to the city of Des Moines, and provided that the powers of the city—executive, judicial, and legislative—should be exercised by a single body composed of the mayor and four councilmen. The court said, in giving its reasons for upholding the statute: "Mayors of cities and towns have conferred upon them powers and duties both executive and judicial, and, particularly in towns, the mayor, in virtue of his right to vote on all questions coming before the council, constitutes in all strictness a part of the corporate legislative body. Boards of supervisors, city and town councils, boards of school directors, township trustees, and various individual officers are directly charged with and are in the performance of powers and duties, now, administrative in character, and again judicial, etc. . . . . The statute book of this State, as of every State in the Union, is replete with illustrative examples."[112] And in Minnesota the commission charter of Mankato was upheld by the court upon a similar line of reasoning, the court but briefly referring to the authorities on the question, including the California case of People *v.* Provines.[113]

In that case the supreme court of California, overruling a long line of its own decisions on the point, squarely and explicitly took the position

[108] 6 *American and English Encyclopaedia of Law*, 1008. As to mayors as judicial officers, see McQuillen, *Municipal Corporations*, sec. 433.

[109] Uridias *v.* Morrill, 22 *California*, 474 (1863); Baltimore and Ohio Railroad Company *v.* Whiting, 161 *Indiana*, 228 (1903); Santo *v.* State, 2 *Iowa*, 164 (1855).

[110] Santo *v.* State, 2 *Iowa*, 164, 220 (1855).

[111] State *v.* Keener, 97 *Pacific*, (*Kansas*, 1908) 860.

[112] Eckerson *v.* City of Des Moines, 137 *Iowa*, 452, 466 (1908). To the same effect see Bryan *v.* Voss, 143 *Kentucky*, 422 (1911) and State *v.* Ure, 135 *Northwestern*, 224 (*Nebraska*, 1912).

[113] State *v.* Mankato, 136 *Northwestern*, 264 (*Minnesota*, 1912).

that the very definite constitutional provisions of that state relating to tripartite government were not applicable to local governments such as counties or municipalities. Although the court based its decision in part upon the wording and arrangement of the sections of the constitution and in part upon the fact that there are no county or city officers referred to in the express exceptions to the prohibition of a merger of functions, yet its position was justified principally by reasons which would apply to cases arising under the organic law of nearly any state in the Union. These are (1) that in practice separation has never been strictly enforced in local affairs; (2) that such an enforcement results in a reductio ad absurdum, and would require a multiplicity of officers, and so cumbersome and unwieldy a procedure in many cases as to be preventive of any efficiency or expedition in the administration of local matters; (3) that it was not the purpose or intention of the constitution makers to extend the doctrine of distinct departments to the minor subdivisions of the state. In speaking of the reasons why such provisions were incorporated into organic laws in the United States, the court referred to the development of abuses in England from the lodgment of more than one function in the same authority, and then said of the framers of American constitutions: "The mischief, however, against which they sought to provide, did not come from inferior or subordinate officers, but from the higher grades, in whose hands the first and leading powers of the government were vested. So far as the former were concerned, they were sufficiently under the control of the latter. Abuse of power could not come from the former in such measure as to destroy or overthrow the liberties of the people, except by directions or connivance of the latter. To surround the latter with checks was a sufficient protection against the former. Hence the framers of American constitutions were content with checks upon the latter, leaving the former, as we consider, to be regulated by the legislative department."[114]

From the foregoing review of the authorities, it seems generally established in the United States that, even in the absence of specific constitutional authorization, the legislature of a state may enact general drainage statutes, which, if properly drafted, will be sustained as a legitimate exercise of the powers of eminent domain or taxation or of the police power, against any attacks upon the ground that they impose non-judicial functions upon the judiciary and are therefore violative of those provisions common in our or-

[114] People *v.* Provines, 34 *California*, 520 (1868) overruling Burgoyne *v.* Commissioners, 5 *California*, 1 (1855) and later cases to same effect, and followed in California in Holly *v.* County of Orange, 106 *California*, 420 (1895) upholding a drainage statute. See also Elliott, *Municipal Corporations*, 196. For cases of mixed functions in local affairs, see appellant's brief in Burgoyne *v.* Commissioners, 5 *California*, 1 (1855); as to county courts, Stone *v.* Wilson, 39 *Southwestern*, 49 (*Kentucky*, 1897); State *v.* Judges, 21 *Ohio State*, 1 (1871); Walker *v.* City of Cincinnati, 21 *Ohio State*, 14 (1871); and, as to municipal courts, Phinizy *v.* Eve, 108 *Georgia*, 360 (1899).

ganic laws to the effect that the powers of government shall be exercised by three distinct and separate departments.

In Minnesota the right of the legislature to enact general drainage statutes without express constitutional authority has been referred to the police power, the power of eminent domain, and the taxing power.[115]

The bases of the legislative right were merely incidentally referred to in the cases of Curran *v.* Sibley County and Witty *v.* Nicollet County, decided in 1891 and 1899 respectively. The first case passed upon by the supreme court of the state in which the authority of the legislature was directly challenged, and the constitutionality of drainage laws in Minnesota squarely at issue was Lien *v.* Norman County, which was decided in 1900, thirteen years after the enactment of the first great drainage statute in Minnesota. In that case it was claimed that the act of 1887[116] was unconstitutional because it authorized the taking of private property for a private use, and provided for a levy of taxes which were not uniform or based upon the value of the property. The supreme court, however, held the act constitutional. Speaking through Justice Brown, it said: "The authority of the Legislature to enact drainage laws is derived from the police power, the right of eminent domain, or the taxing power, and is undoubted. (10 *American and English Encyclopaedia of Law* [2d ed.], 223.) It is founded in the right of the state to protect the public health, and provide for the public convenience and welfare . . . . Where the laws have for their object the reclamation of large tracts of wet and swampy land for agricultural purposes, they are sustained under the right of eminent domain. The fact that large tracts of otherwise waste land may be thus reclaimed and made suitable for agricultural purposes is deemed and held to constitute a public benefit. When the object is to drain such lands in the interest of the public health and welfare, such laws are sustained and upheld as a proper exercise of the police power. (Bryant *v.* Robbins, 70 *Wisconsin,* 258; Wurts *v.* Hoagland, 114 *United States,* 606.[117] . . . .) There can be no question but that the act is in the interest of the public, and for exclusively public purposes. No ditch can be established or laid out thereunder unless the county commissioners expressly find that it will be of 'public utility or conducive to public health or of public benefit or convenience.' . . . . It does not matter that in accomplishing the public objects of the act private interests are advanced. Such a result is merely incidental, and does not effect the validity of the law.[118] 'It is not necessary in order to consti-

[115] Curran *v.* Sibley County, 47 *Minnesota,* 313 (1891); Witty *v.* Nicollet County, 76 *Minnesota,* 286 (1899); Lien *v.* Norman County, 80 *Minnesota,* 58 (1900); State *v.* Polk County, 87 *Minnesota,* 325 (1902); State *v.* Rockford, 102 *Minnesota,* 442 (1907). (Act unconstitutional); Van Pelt *v.* Bertilrud, 117 *Minnesota,* 50 (1912).

[116] Minnesota, *Laws,* 1887, ch. 97, *General Statutes,* 1894, sec. 7793 *et seq.*

[117] Lien *v.* Norman County, 80 *Minnesota,* 58, 62 (1900).

[118] *Ibid.,* 64.

tute a public use, that the whole community or any large portion thereof, should participate in the use, or that all should be equally benefited (Ross *v.* Davis, 97 *Indiana,* 79; Talbot *v.* Hudson, 16 *Gray,* 417; Chesbrough *v.* Commissioners, 37 *Ohio State,* 508; 10 *American and English Encyclopaedia of Law* [2d ed.], 225.) The benefits may be limited to the inhabitants of a small locality, and, if they are enjoyed in common by all, the use is sufficiently public[119] . . . . In all cases where such laws are authorized the further power and authority to provide for assessing the cost and expense of the improvement against the lands benefited follow as a natural result. The power to so assess the cost of the improvements against lands benefited is a necessary and proper incident to the exercise of the power to make the improvement. And a statute providing therefor is not open to the constitutional objection that it is unequal taxation."[120]

The constitutionality of the act of 1897[121] was attacked in 1903, but merely on the ground that it embraced more than the subject expressed in its title. This claim was held untenable, and the validity of the act affirmed.[122]

The drainage act of 1901[123] differed from prior statutes in this state in that it did not expressly and in so many words declare that its purpose was to subserve the public health, convenience, or welfare; nor did it specifically provide for a determination by the county commissioners of the question as to whether or not a particular ditch was of public utility. And it was again urged by those seeking to overthrow the statute that it authorized the taking of private property for a private purpose. The court, however, refused to recognize these objections to the law. Citing authorities to sustain its position, it said that "While the element of public health is often made an important factor in the consideration of statutes of this kind, it is believed that any public benefit, such as the improvement of highways or the reclamation of large tracts of otherwise waste lands, is sufficient to support and sustain them.[124] To authorize proceedings under the statute, therefore, that question[125] must be determined either at the preliminary hearing upon the petition, or at the second or final hearing. While the statute does not, in express terms, require the board to determine it, the existence of the fact being essential to their authority to proceed in any case, and essential to the validity of the statute, too, the power to determine it must be implied."[126] The court not only applied in this case the familiar principle that

[119] *Ibid.*, 58, 67.
[120] *Ibid.*, 63.
[121] Minnesota, *Laws,* 1897, ch. 318.
[122] Gaare *v.* Clay County, 90 *Minnesota,* 530 (1903).
[123] Minnesota, *Laws,* 1901, ch. 258.
[124] State *v.* Polk County, 87 *Minnesota,* 325, 335 (1902).
[125] Whether a public benefit.
[126] State *v.* Polk County, 87 *Minnesota,* 325, 341 (1902).

the presumption is in favor of the constitutionality of legislative acts, and that they should not be declared void on account of mere mistakes, omissions, or inaccuracies of language, unless a clear repugnance to constitutional provisions results therefrom;[127] but it frankly admitted the influence of considerations of expediency upon its decision, and expressly referred to the fact that large sums of money had been spent in numerous proceedings already conducted under the statute, and that disastrous results would follow, were the court to hold the act invalid.[128]

In the case of State *v.* Crosby[129] the supreme court of Minnesota affirmed the validity of the drainage statute of 1902.[130] This act related to the construction of ditches under the authority of the district court; it was attacked on the ground that it attempted to confer upon the courts legislative and administrative powers. The supreme court in its opinion written by Justice Brown said: "The marked tendency of legislation in recent years, not only in this state, but in other states, has been, to a large degree, to break away from the theory of three separate and independent departments of government, by imposing upon other departments duties and powers of a legislative character, which the courts have been inclined to sustain. Perhaps few if any cases are to be found, however, where statutes imposing purely legislative duties and powers upon the courts have been upheld; but the authorities are numerous, sustaining statutes which impose upon the courts powers involving the exercise of both judicial and legislative functions—such as the condemnation of land for public purposes, the appointment of commissioners of election in proceedings for adding territory to municipal corporations, and laying out and establishing highways. The proceedings provided for by the statute under consideration involve the exercise of both legislative and judicial powers. The question of the propriety or necessity of public ditches to drain marshy or overflowed lands is one of legislative character. The condemnation of land through which such ditches may be constructed, the assessment of damages, and the determination of the legal rights to parties affected are judicial. The exercise of all these powers is involved in proceedings under the statute.

"The power and authority to lay out and open public highways is legislative in its nature and essentials, and in no sense except in some details is it judicial. Yet we have sustained legislation providing for the laying out and opening of so-called judicial highways; statutes conferring upon the district courts of the state authority to lay out and open highways where they extend into two or more counties. (State *v.* Ensign, 55 *Minnesota,*

[127] *Ibid.*, 334.
[128] *Ibid.*, 343.
[129] 92 *Minnesota*, 176 (1904).
[130] Minnesota, *Laws*, 1902, ch. 38.

278; State *v.* McDonald, 26 *Minnesota,* 445) . . . . Though the power and authority in each case is legislative in character, in carrying out and applying the statute the exercise of judicial functions is also involved. No distinction can be made between the judicial highway and the judicial ditch. . . . . There being no logical distinction, the statute under consideration must be sustained, or we must overrule the cases just cited. We prefer to follow those decisions and sustain this statute."[131]

The judicial ditch act was again attacked in 1904, but there was little said as to the public purpose of the statute. It was claimed that since the law[132] required an assessment against the landowners for all the benefits received, and then permitted the town supervisors to assess the same lands for the cost of repairs and the removal of obstructions, there was double taxation, and the taking of property without due process of law. But the court, following its previous decisions in State *v.* Polk County and State *v.* Crosby, held the act constitutional, reaffirming its position in a very brief opinion.[133]

In the case of Miller *v.* Jensen[134] the supreme court upheld the validity of the act of 1905[135] against the objection that it authorized the taking of private property without due process of law and for a private purpose. Chief Justice Start in the opinion dismissed the objections of those opposed to the law with a brief reference to the prior decisions of the court.

Chapter 191 of the Laws of 1907 was declared unconstitutional in that year in State *v.* Rockford.[136] The court pointed out that the county drainage act had been held public in character and therefore constitutional, and did not question the correctness of its prior decisions to that effect. But it held that the act of 1907 was different in character. Under it proceedings could be instituted (1) when public health might be in danger, (2) when the drainage would result in the reclamation of waste lands, (3) *or* "where the construction of such ditch or drain is [was] of benefit to the lands of the adjoining owner or owners." The court said: "The use of the disjunctive in this connection is significant. . . . . Under the express terms of the law the property of adjoining landowners may be taken for a private purpose only. . . . . The law authorizes the taking, against the owner's will, of enough of his lands to make a ditch, or the imposition of a burden on that land to that extent against the owner's will, and for the benefit of an adjoining landowner. It is plainly designed to promote individual convenience."[137]

[131] State *v.* Crosby, 92 *Minnesota,* 176, 180, 181 (1904).
[132] Minnesota, *Laws,* 1901, ch. 258, as amended by Minnesota, *Laws,* 1902, ch. 38.
[133] McMillan *v.* Freeborn County, 93 *Minnesota,* 16 (1904).
[134] 102 *Minnesota,* 391 (1907).
[135] Minnesota, *Laws,* 1905, ch. 230.
[136] 102 *Minnesota,* 442 (1907).
[137] State *v.* Rockford, 102 *Minnesota,* 442, 444 (1907).

In 1908, section 40 of chapter 448 of Laws of 1907 was likewise declared void and unconstitutional; but this was not upon the ground that the purpose of the statute was not public, but because of a faulty method of assessing benefits, which the court considered as resulting in taking private property without due process of law, and without just compensation therefor.[138] But the act was also criticized because it failed to specify the purpose to which payments by landowners into the county treasury were to be devoted; so that it was problematical whether or not that purpose was a public one.[139]

Chapter 230, section 26, Laws of 1905 authorized the county commissioners to widen and deepen ditches, and to assess the costs of repairs and removing obstructions against the owners of land benefited without any provision being made for a hearing. This the court held invalid because without due process of law. It pointed out that if the statute authorized ordinary repairs it would follow Iowa and some other states, and hold notice and hearing unnecessary because of the small amount involved and the delay that would result from requiring such hearings. But this act went farther and permitted the county commissioners to widen and deepen ditches already built. This might result in the construction without notice or hearing of new ditches in effect, if the enlargement were sufficiently great. To that extent the act was unconstitutional.[140]

These last two decisions of the supreme court of Minnesota show that it is careful to preserve the ostensibly public character of drainage acts as a justification for them. But it is clear that in Minnesota, as in other states, the courts have seen that unless some constitutional ground for general drainage acts could be found, less progressive owners of land, by refusing to allow their more progressive neighbors to build ditches across their lands

[138] Lyon County *v.* Lien, 105 *Minnesota,* 55 (1908). In this case the court in its opinion pointed out that if, after a public ditch has been constructed, and the entire cost thereof assessed upon all lands benefited thereby, another ditch be constructed so that it discharges its waters into the original ditch, whereby the cost of keeping the first drain in repair and of enlarging it when necessary is increased, it is obvious that the lands benefited by the new ditch should be assessed for their just and proportionate share of the cost of maintaining the original ditch; that the legislature evidently intended to enforce this equity by the section in question; that it arbitrarily provided that the owners of land along the new or second ditch should pay into the county treasury the same proportion of the benefits received by their lands that the lands assessed for the original ditch were forced to pay; that is, this did not provide any reasonable means of ascertaining the actual benefits to landowners along the new ditch from the maintenance of the first one. The cost of establishing and constructing the original drain, matters as to which landowners benefited by the new ditch had neither notice nor opportunity to be heard, were by the act in question made the basis of an inflexible rule. If the method prescribed by the statute were followed in a case where the cost of building a certain ditch was seventy-five per cent of the benefits received, then the owners of the land drained by it before a second ditch was constructed so as to empty into it, were forced to pay into the county treasury a sum equal to that seventy-five per cent. But those benefited by the new ditch must also pay into the treasury a corresponding seventy-five per cent. This the court held to be a taking of an amount arbitrarily fixed, without any reasonable relation to benefits received, and therefore uncompensated and without due process of the law.

[139] Lyon County *v.* Lien, 105 *Minnesota,* 55 (1908).

[140] State *v.* McGuire, 109 *Minnesota,* 88 (1909). For a brief reaffirmance of the constitutionality of drainage acts see Van Pelt *v.* Bertilrud, 117 *Minnesota,* 50 (1912).

could prevent the reclamation of swamp lands, and retard the development of the country. But it is also apparent that in many cases, as an actual fact the purpose of the work is really private, and for no public purpose whatsoever, so far as the legal definition of that term is concerned, and that the courts have seized upon the possible benefits to the public health or welfare as a mere pretext for upholding legislation which practically everyone agrees to be wise.[141]

The legislatures of the states, in the exercise of their constitutional right to enact general drainage statutes, have as a rule provided a system of drainage procedure, the principal features of which are substantially as follows:

1. The county court, or circuit court, county commissioners or supervisors, are given authority to administer the law, and in most states the procedure is kept within the county (although sometimes several counties may coöperate); and with the exceptions of South Carolina and California, which require reports to the governor, and Minnesota and Florida, which have state commissions, the state government itself takes no direct part in the work.

2. The proceedings are initiated by petition to the county commissioners or corresponding authority, signed by a certain number of landowners, describing the lands which it is proposed to drain, and indicating in general the location, size, direction, and number of proposed ditches, and asking for the establishment of a drainage district. The petition must be accompanied by a bond conditioned to pay all costs in case the board refuses to establish the drainage district.

3. If the petition complies with the law, the board appoints a certain number of viewers, who examine the land, and file with the board a report containing a description of the lands that will be benefited or damaged, the amount and kind of drainage required, and a finding as to whether the total costs of the work will exceed the total amount of the estimated benefits.

4. The board, after published and personal notice to persons whose lands will be likely to be affected by the proposed work, has a hearing at which objections to the proposed work are heard and considered, as well as the report of the viewers. The board may either dismiss the petition, if it discovers that the work will cost more than it is worth, or if it will not be of public benefit or utility; or it may declare the drainage district organized.

5. When the district is organized the board orders a complete survey, maps, plans and specifications to be made by an engineer and a report is filed by him which contains an estimate of the cost, and a description of the lands benefited or damaged.

6. The board may amend or adopt the engineer's report; then it either awards damages to, or assesses benefits against, individual landowners itself, or it appoints special commissioners to do that work. The reports of assess-

[141] Freund, *Police Power*, (1904 ed.), secs. 127, 441, 442.

ments charged against, and damages allowed to, each tract of land are filed with the board, and then a public hearing is held at which persons charged with benefits or allowed damages may object to such awards and assessments. These may then be changed by the board so as to make them more equitable.

7. The board lets contracts for the work to the lowest responsible bidders and appoints an engineer to supervise the work,[142] and report as to whether or not the plans and specifications are being complied with by the contractors.

8. The assessments for benefits as a general rule are made a first lien upon the property benefited, and are usually collected in the same way as taxes, but generally in installments extending over several years. The moneys collected constitute a separate drainage fund which is used to reimburse the county for preliminary costs advanced by it, and to pay off the bonds issued by it or the district. In many states these bonds may be issued to the extent of ninety per cent of the cost of the work, provided the landowners so decide by vote, or, in some cases so request in their petition. The laws generally provide that the bonds shall not be sold at less than par, and prescribe a maximum rate of interest. The landowners are protected by provisions for due notice to them of all steps in the procedure which may affect their interests, and by the right to file protests against the proceedings, or to object at public hearings or otherwise to allowances of damages and assessments of benefits, and to appeal to the state courts.[143]

To enter into a discussion of the adjudicated cases relating to drainage procedure would be proper in a treatise on the law of public drains, but would unnecessarily prolong this work, and would not be particularly valuable since it would involve a treatment of many questions of detail dependent for their solution largely upon the construction or provisions of particular statutes. It seemed best to confine the statement of the principles derived from the case law on the subject of public ditch acts, to the broad question of the constitutionality of such laws.[144]

[142] Sometimes the statutes require that the work be done by the county surveyor.

[143] In Appendix 2 is given a list of the statutes upon which the text is based and a brief summary of their provisions. For the sake of clearness and of brevity, it seemed best to confine a discussion of the statutes in particular states and of any provisions not covered by the text, because of their local or peculiar character, to the appendix. If any state is not referred to in this appendix it is an indication that up to the year 1914 it had enacted no general drainage law.

[144] For statements of the law relating to questions of more detail and of procedure, see articles on drains in such works as *American and English Encyclopaedia of Law; Cyclopedia of Pleading and Practice; Cyclopedia of Law and Procedure;* notes in 53 *American Reports,* 350; 15 *American and English Annotated Cases,* 908; and in *Lawyers Reports Annotated,* especially 60 *Lawyers Reports Annotated,* 161 *et seq.,* and 58 *Lawyers Reports Annotated,* 353 *et seq.*

CHAPTER V

THE DEVELOPMENT OF DRAINAGE LEGISLATION IN MINNESOTA

The first law relating to drainage in Minnesota was an act of August 3, 1858, entitled, "An Act to regulate and encourage the drainage of lands." This statute provided that any number of persons might associate for the purpose of draining lands, and be incorporated with the usual powers of a corporation, after filing a copy of their proposed charter with the registers of deeds of the counties through which their drains were to be constructed. Before the corporation could commence to construct ditches it would have to secure the written consent of the majority of the owners or occupants of the lands through which the drains were to pass. Published or posted notices were to be given of the course of proposed drains, and a description of the lands over which they were to be laid out. Such drainage companies could levy a pro rata tax on all lands benefited. Landowners assessed could construct lateral ditches, but no other persons were authorized to do so without the consent of the corporation. The land drainage company was to be liable for all damages due to its drains injuring or overflowing lands of private owners without their consent. Such damages were to be assessed by a jury in action brought in any court of record, but no vindictive damages were to be allowed.

Three years after the passage of this act, when land was still plentiful and cheap, and men were engrossed in the problems of a new frontier state, it was perhaps natural that Governor Ramsey should refer optimistically and but briefly to the drainage problem in Minnesota. After referring to the fact that the state has 5,000,000 acres of swamp lands, not "miasmatic bottoms, reeking with the elements of disease," but "flat low lands of the summit levels," he says of them in his message to the legislature in January, 1861: "From their nature and situation they are capable of easy reclamation; and in fact this is being gradually effected without expense, by the progress of cultivation and settlement. And it is a well-known fact that a constant and rapid process of drainage is going on in the upper lake country by the silent agency of nature, which in no long time will add largely to the agricultural areas of the state. In a climate so dry as ours, we may naturally expect that lands of this class will eventually be the most valuable in the state." Far-seeing as Governor Ramsey was as to the future value of these lands, he thought that it would be sufficient if "the silent agency of nature" were aided merely by requiring purchasers of swamp lands from the state

to drain them as one of the conditions of sale. He made no further suggestions as to drainage legislation.

As might be expected, there was no drainage legislation during the period of the Civil War, but by chapter 27 of the Laws of 1866, it was provided that any person owning swamp land and desiring to drain it, but considering it necessary to ditch lands of other persons, who refused to permit him to do so, might apply to a justice of the peace. Such justice would cause summons to be served to such owner if a resident of the county, and if not, then on the occupant of the lands through which the applicant desired to construct a drain. After sufficient notice and hearing, the justice of the peace might dismiss the application for any sufficient reason, or else he could summon a jury in the same way as in a civil case. This jury should personally examine the premises and report to the court whether or not it considered that the ditch petitioned for would be "necessary and advantageous" and also report the amount of damages which it considered just compensation to the owner of the land crossed by the ditch. Appeal from this finding could be taken to the district court. The work could not be proceeded with until the applicant paid to the person through whose lands he wished to construct the ditch, the amount of the damages assessed by the jury. The person laying out the drain, his heirs and assigns forever, were to have the right to enter on other lands for the purpose of cleaning and repairing the ditch, and persons obstructing it were to be liable to the one constructing it in double damages, such damages to be determined by a jury.[1]

In 1874 a statute was enacted which authorized the board of town supervisors in any township to open ditches for the purpose of draining public highways. On notice from the overseer of highways, the chairman of the board of town supervisors was to call a meeting of the board, and then the members were to examine the premises personally, have a public hearing after published and posted notice, and then assess damages and benefits against landowners, and order the construction of the ditch by the supervisor of highways under their direction, if they should deem such action advisable. All damages were to be paid in the same way as those assessed for the construction of public highways. Appeal could be taken to the district court as in civil actions.[2] It will be noticed that the prime object of this law was not the drainage of lands for agricultural purposes, but for the improvement of highways.

In 1877 an act was passed "to provide for the draining of wet lands, marshes, and swamps." Persons desiring to open ditches across the lands of neighbors who refused to allow such construction, could appeal to the town supervisors, who were to hold a public hearing after due notice, de-

[1] Minnesota, *Laws*, 1866, ch. 27.
[2] *Laws*, 1874, ch. 57.

termine on the application, assess damages and benefits, and determine the course of the drain. The applicant, after first paying the damages assessed, was to construct the ditch himself, and after it was completed if the landowners assessed for benefits did not pay such assessments to the applicant who built the ditch, such assessments were to be filed with the register of deeds and constitute liens on the lands benefited. Persons feeling aggrieved as to assessments for damages could appeal to the district court.[3] Thus, by this statute of 1877, the principle of a public hearing and an assessment of damages and benefits by the town supervisors in the drainage of highways under the law of 1874, was carried over and applied to the drainage of lands of private persons for purely agricultural purposes. The requirement of the law of 1866 (relating to action by the justice of the peace) that the one desiring the ditch should build it himself and first pay the damages, was continued.

An act of March 10, 1879, provided, among other things, that when it should be necessary to extend any drain into more than one town, the supervisors of the town where the application was first filed should submit the same to the county commissioners of that county at the first subsequent meeting, and on being satisfied that such ditch or drain was a "public necessity or accommodation" such county commissioners should direct the supervisors of the several towns to take measures for the construction or extension of such ditch in their respective towns.[4] This statute may be noticed for two reasons: (1) because it marks the first use of the board of county commissioners, which has been one of the chief agencies used in drainage work in this state, and which is still the basis of Minnesota's drainage system, and (2) because it is one of the first illustrations of the fact, that, as drainage work progresses, it becomes necessary to extend the ditches over larger and larger portions of the watershed, and, as a consequence, governmental agencies having successively greater territorial jurisdictions are found necessary. In this particular instance, no doubt those who had constructed ditches as far as they could under authority of the board of supervisors, that is, to the township line, often found difficulty in getting neighboring supervisors to permit them to enter their townships at all, or at least soon enough to be of any benefit to such ditch constructors. And so the county commissioners were to be used as a means of securing that united and reasonably prompt action by several town boards that was found necessary whenever a ditch was to extend through more than one township.

Probably this act of 1879 did not prove satisfactory to those who wished to open drains through more than one township, for a statute of March 1, 1883, provided for regular proceedings directly through the board of county

[3] *Laws*, 1877, ch. 91.
[4] *Laws*, 1879, ch. 38.

commissioners, without any action by the town supervisors. This law, chapter 108, furnishes many of the principal features of the present scheme of drainage procedure. It provided that the board of county commissioners should have power at any regular session, when the same should be "conducive to the public health, convenience, or welfare," or where the same would be of "public benefit or utility," to cause drains to be constructed in the county. The principal acts authorized or required by the law were as follows:

1. Petition filed with the county auditor, signed by one or more of the landowners whose lands were liable to be affected by, or assessed, for the construction of the proposed drain, setting forth its course in general.
2. Bond by petitioners, conditioned to pay all expense in case the county commissioners should not establish the ditch.
3. Appointment of three resident freeholders as viewers.
4. Viewers, with a civil engineer, to make a survey of the course of the proposed ditch, estimate the cost of the work in detail, "apportion to each parcel of land and to each corporate road or railroad and to the county when public highways are benefited a share of said work in proportion to the benefits which will result to each from such improvement," provide general plans for the ditch, and determine whether it will be of "public utility." The viewers also to assess the damages that any person might sustain by reason of the construction of the ditch, to establish the route, and report in full to the county auditor by a certain time.
5. Notices to be published, and posted in certain places for three successive weeks by the auditor, describing route, lands crossed or assessed, time and place of hearing, etc.
6. Public hearing at which the county commissioners determine whether the ditch will be of public utility, or convenience, or will promote the public health.
7. Review of the proceedings of the viewers to be taken by "reviewers" on remonstrance of persons interested in the ditch.
8. Final report, and order of construction by the county commissioners.
9. Appeals by persons "aggrieved" from order of the county commissioners determining: (a) whether conducive to public health, convenience, or welfare; (b) whether route is practicable; (c) whether assessments are in proportion to the benefits; (d) amount of damages allowed.
10. Auditor to let jobs to lowest bidders.
11. Acceptance by county surveyor, by certificate; such to be liens on the lands against which such pieces of work were respectively charged; collected like taxes.

12. Repairs to be made by town supervisors; paid for out of general township fund, reimbursed by assessing lands for benefits.

Thus, the town supervisors, who had been the agencies used in the drainage laws of 1877, were now to be used for the purpose of making repairs instead of original construction.

The act of 1883 further provided that whenever the route of a proposed drain was to extend into two counties or more, the petition should be signed by one or more of the landowners in each county whose land was liable to be assessed, and filed with the auditor of the county containing the head or source of the proposed drain. A copy of the petition should then be transmitted to the auditor of each other county interested, after which the county commissioners of such counties should appoint viewers to meet and act conjointly. The joint ditch could then be established by action of the county commissioners, auditors, viewers, and other officers, acting together, and following the procedure provided for ditches extending through single counties alone, so far as practicable.[5] Thus, there was an attempt to anticipate the demand that would be sure to arise for some means of securing the action of the necessary officials in more than one county whenever it should be found necessary or advisable to extend a ditch into more than one county. We shall note later on that this provision for the joint action of several different bodies proved unsatisfactory in the same way that the act of 1879, which required the working together of different boards of town supervisors, where a ditch was to extend into more than one township, did not work well.

Between 1875 and 1891 there were fifteen acts passed authorizing certain persons named in the acts to drain lands bordering on certain lakes, or to lower such lakes on securing the written consent of landowners affected, and in some cases filing such consent with the registers of deeds and acknowledging them in the same way as deeds of real estate.[6] In 1883 and 1885 certain named persons by special act were empowered to drain specified lakes on complying with the laws of the state relating to the drainage of wet lands.[7] Acts of 1875 and 1876 authorized any persons to drain lands near lakes named in the acts on giving bonds to the county commissioners conditioned to pay all damages assessed by such commissioners in case the ditching should be accomplished.[8] A special statute of 1883, passed three days before the "county commissioners" drainage law of that year, permitted the drainage of a lake in Douglas County by certain named persons, provided the total costs were paid "by all the owners of lands whose lands shall be benefited by such drainage."[9] And an act of 1887 gave the county commissioners of Anoka County authority to ditch certain marsh on apportion-

[5] *Laws*, 1883, ch. 108.

[6] *Special Laws*, 1875, ch. 152, 153, 159; 1876, ch. 192, 193, 194, 195; 1877, ch. 127; 1879, ch. 187; 1883, ch. 268, 309; 1885, ch. 193; 1889, ch. 358, 300; 1891, ch. 408.

[7] *Special Laws*, 1883, ch. 267; 1885, ch. 192.

[8] *Special Laws*, 1875, ch. 157; 1876, ch. 190.

ing the benefits, damages, and expenses, and complying with the requirements of the law of 1883 and acts amendatory thereto.[10] These statutes, special in character as they are, are indicative of the difficulties met with during this period from 1875 to about 1887 or 1891, in connection with the drainage of meandered lakes, and the dealing with special problems in certain localities, as well as the need of a comprehensive code of drainage laws.

The first organized attempt to secure the enactment of a carefully worked out, comprehensive statute that would provide a satisfactory procedure for the drainage of wet lands, arose in the Red River Valley, because of the great need of drainage in that section. The Minnesota side of the Red River Valley is composed of three planes, all of which slope towards the north, like the bed of the river. The planes to the west and east have a sufficient incline to be tolerably well drained by natural watercourses, but the middle plane, which is ten miles wide and about two hundred and twenty-five miles long, has very little slope, is crossed by practically no small streams, and its drainage aided very little by the few large ones because their courses are so winding as to be incapable of rapidly carrying off storm water. Red River lands are, as is well known, among the richest wheat-producing lands in the world, but the farmers in this middle plane soon found its lack of proper drainage a serious handicap. If they seeded early, a frost would be almost certain to destroy their crop, because the soil remained wet so late in the spring that a frost was more disastrous on their lands than on the better-drained and drier lands to the east and the west. If they put off their seeding until they were sure to escape any late frosts, they had difficulty in maturing their crops, or else they frequently lost advantages which might have been gained had they been able to get their wheat earlier to market. Thus, it was natural that the need and advantages of artificial drainage should early be seen in this section of the state, and that landowners there should take the first steps as an organization to secure public action.

The first attempts to drain lands in this middle section that can be traced were made under the direction of Mr. J. J. Hill, as president of the St. Paul, Minneapolis and Manitoba Railway Company, one of the predecessors of the Great Northern Railway Company. About 1879, ditches were constructed along the line of the railroad for the purpose of carrying off storm waters, especially in the spring. It is true that prior to that year certain energetic owners of large farms in the valley had built a few drains, but these were quite small and were strictly private enterprises. The Great Northern ditches were about fifteen in number, and their aggregate length was about forty-five miles. With the exception of one ditch sixteen miles

[9] *Special Laws*, 1883, ch. 257.
[10] *Special Laws*, 1887, ch. 357.

long they were from one half to three miles each in length, not much more than three feet wide at the bottom, and not very deep. They were located in Kittson, Polk, Norman, and Clay counties.[11] As the engineer for the drainage commission says in the report of 1899: "Without doubt much good was done by these small pioneer ditches, not the least of which was the object lesson they furnished to the farmer of what service even small drains could be. From the working of these they could easily see of what incomparable good larger ditches would be if they were of adequate size."[12] Thus, it is clear that these railroad and private ditches, though small, strictly local in character, and far from adequate, especially during the spring freshets, were nevertheless of importance as leading the way to the development of a comprehensive system of drainage.

In June, 1886, newspapers in the Red River Valley published a call for "a general mass convention" of the people of that section to meet in Crookston on the first and second of July, "for the purpose of considering the subject of drainage in said section generally, and to devise means for the accomplishment of a thoroughly effectual and general system of drainage for said section of country." All interested persons and three delegates from each of the towns and cities in Wilkin, Clay, Marshall, Polk, Norman, and Kittson counties were invited to be present and take part in the discussion.[13] At the meeting of the convention in July, two of the principal addresses were given by Mr. J. J. Hill, and Mr. C. G. Elliott, a drainage engineer from Illinois.[14] The former pledged the hearty coöperation of the railroad company which he represented, and which at that time owned 1,013,000 acres of land in the Red River Valley, and suggested a payment for drainage work by direct assessment on lands benefited. The latter, after pointing out the great benefits to be derived from drainage in the valley, described the plan of doing work in Illinois, where a majority of the landowners in any township, not less than one third of the area being represented, might petition the county authorities for a survey, after which the work might be constructed under the road masters who acted as ditch supervisors. The expense of main drains was met by issuing bonds, and sub-drains were built on the farms of private landowners at their own expense. One skeptical delegate said that the whole valley was not worth enough to pay for the cost of drainage, and a few representatives from Kittson County were a little afraid that the construction of drains opening into the Red River might lead to the overflowing of that stream to the damage of the lands along the lower

[11] Drainage Commission, *Report*, 1899.

[12] W. R. Hoag in *ibid.*

[13] *Crookston Times*, June 5, 1886. Call signed by E. D. Childs, M. R. Brown, H. Steenerson, William Main, C. Sangstad.

[14] Mr. Elliott, up to a recent date, was chief of drainage investigations for the United States Department of Agriculture.

part of its course.[15] These men were, however, in a very small minority. It was the general opinion of the men in the convention that before anything could be accomplished there must first be an accurate topographical survey of the section which it was proposed to drain, and the sum of $10,000 was to be raised for that purpose, one half by the counties concerned and one half by the Great Northern Railroad. Mr. Elliott was appointed chief engineer and Mr. Fanning, consulting engineer, and the convention then adjourned, to meet again in the following December after the survey should have been completed.

The convention met again at Crookston on December 8, 1886, and received an exhaustive report from the engineers who in the meanwhile had completed the topographical survey.[16] The report established the feasibility of draining this section, defined what ditches were needed, and indicated in a general way their location. It called for about 275 miles of main ditch costing about $750,000.[17] A committee of five members, one from each of the counties interested, was appointed to prepare and present to the legislature a general drainage law, such law to embody provisions for the "organization of drainage districts as municipal corporations; the equitable assessment of benefits and damages; the charging of lands benefited with cost of construction and maintenance of main drains and outlets, and also the damages to land injured; the construction of roads in connection with ditches; . . . . for the prosecution of work by bonds to be paid from the assessments of benefits; for the payment of those assessments by installments extending through a series of years; and the appointment of a state drainage commission, whose duty it shall be to approve and supervise in a general way the work of the districts. . . . ."[18] Another resolution also was unanimously adopted which called on Governor Hubbard and Governor-elect A. R. McGill, in their messages to the legislature, to call attention to the need of "careful and judicious legislation on the subject of drainage and the justice and necessity of a very liberal appropriation by the state to open up the obstructed river channels in" that section of the state.[19]

At the opening of the legislative session in the following January, Governor Hubbard expressed his willingness to comply with the request of the

[15] *Crookston Times*, July 3, 1886; J. J. Hill, *Highways of Progress*, 184-202; Drainage Commission, *Report*, 1899.

[16] J. J. Hill, *Highways of Progress*, 184-202. The legality of contributions by the counties towards the expenses of the topographical survey had been seriously doubted, but some had suggested that the county treasurer nevertheless honor the warrants of the county commissioners, in view of the need of a survey as a prerequisite to a demand for action by the legislature that was to meet in a month (*Crookston Times*, August 7, 1888). Later the legislature did authorize the counties of Kittson, Wilkin, Norman, Polk, and Marshall to contribute to such expenses, and legalized their action if they had already done so. (*Special Laws* 1887, ch. 222; 834; February 21, 1887).

[17] W. R. Hoag in Drainage Commission, *Report*, 1899.

[18] *Crookston Times*, December 12, 1886.

[19] *Ibid.*

Crookston convention and do what he could to aid in the drainage of the wet lands in the Red River Valley, but stated that the constitution stood in the way of state aid since section 10 of article 9 provided that "the credit of the state [should] shall never be given or loaned in aid of any individual association or corporation;" and section 5 of article 9 prohibited the state from contracting "any debts for works of internal improvement," or becoming a "party in carrying on such works except in cases where grants of land or other property shall have been made to the state specially dedicated by the grant to specific purposes." But he stated that appropriations "of portions of the internal improvement fund which is biennially distributed to aid in the construction of roads and bridges could very properly be devoted to drainage purposes as herein contemplated."[20] Governor McGill in his inaugural message to the same legislature took a substantially similar position, and then went on to urge the passage of a "well-considered" drainage law. He said: "The law on the subject now on the statute books has been found inadequate to the necessities, and should be radically amended or superseded by an act much more comprehensive and better adapted to our wants."[21] In spite of the work of the legislative committee that had been appointed by the Crookston Convention, the suggestion of Governor Hubbard, and the support of men from the Red River Valley, the legislature of 1887 made no general appropriation in aid of drainage in that section;[22] but it did do considerable in the way of improving the general laws relating to drainage. It elaborated the system that had been provided by the laws of 1883 for procedure through the county commissioners,[23] and provided that lands owned by the state should be subject to assessment for benefits in the same way as the lands of private persons,[24] this latter provision having been suggested by resolutions of the convention at Crookston.[25] The law of

[20] Governor Hubbard in his message of January 5, 1887, in Minnesota, *Executive Documents*, 1886-1887, 1:29.

[21] Governor McGill in his message of January 5, 1887, in *Executive Documents*, 1886-1887, 1:56.

[22] Drainage Commission, *Report*, 1899; *Legislative Manual* 1909, p. 314. Note the term "general" appropriation. It is true that in 1885, and up to as late as 1897, there were a few special appropriations. Thus in 1885, $700 was appropriated out of the internal improvement fund to be spent by the county commissioners of Renville County on drainage work. (*Special Laws*, 1885, ch. 69). Similar laws are cited below with the amounts, purposes for which to be spent, and authorities under which the work was to be done:

Laws, 1891, ch. 162, title P, County commissioners, Waseca. $800. Bridge and to drain lake.

Laws, 1891, ch. 162, title Z, County commissioners, Steele. $700. Road and to drain lake.

Laws, 1895, ch. 807. County commissioners, Pope. $3,000. Drainage.

Laws, 1897, ch. 103, title 114. Town supervisors in Otter Tail County. $75. Drainage.

Laws, 1897, ch. 103, title 86. Three men named. Town of Carlos, Douglas County, $100. Drainage.

Laws, 1897, ch. 103, title 94. Three men appointed by the Governor. Kandiyohi County. $100. Drainage.

Laws, 1893, ch. 241. Reimburse Becker County for money paid out in ditching state lands. $980. (Not strictly to be included here; really curative in character.)

[23] *Laws*, 1883, ch. 108.

[24] *Laws*, 1887, ch. 97, sec. 22.

[25] *Crookston Times*, December 12, 1886.

1883 had allowed appeals to be taken to the courts on four grounds alone, but the statute of 1887 allowed appeals on five grounds, now including the question whether the total costs exceeded the total benefits. Damages were to be paid out of the county treasuries, which were to be reimbursed from the assessments of benefits. The county commissioners were authorized to issue bonds to provide funds for drainage works, and might "transfer from the general revenue fund of the county to such drainage fund any surplus moneys . . . . that can be properly used for the purposes" of the drainage act.[26]

Up to this time there was no permanent drainage organization in the counties, or books, funds, or accounts. The county commissioners and other officers merely acted on each petition as it was presented, and supervised the construction of each ditch, and the matter was dropped. The law now provided that the county commissioners by majority vote at any regular meeting might organize the county into a drainage district. The county commissioners were to constitute a permanent board of drainage commissioners, and by that name should be a body corporate with power to sue and be sued, etc. They should have general supervision and control of all drainage matters pertaining to their district, subject to the provisions of this act of 1887. Their accounts as drainage commissioners, and the records of their meetings as such were to be kept separate from those as county commissioners. The county auditor was to be clerk of the drainage district, and the county treasurer its treasurer. Sub-drainage districts could be organized on petition of a majority of the owners of lands in a district having a common outlet, if owning one third of the lands affected. The board of drainage commissioners was to issue bonds for the benefit of such sub-drainage districts.[27] These two acts of 1887 were patterned after drainage laws in Illinois.[28]

Another statute of the same year provided that town supervisors might construct ditches on petition of not less than six legal voters owning real estate within one mile of the proposed drain. The supervisors were to examine the premises personally,[29] and the petitioners were to pay all damages assessed before they could open the ditch.[30]

Governor McGill in his message to the legislature of 1889 stated that these laws of 1887 met the needs of the state generally, but that more comprehensive measures were needed for the Red River Valley.[31] The farmers

[26] *Laws*, 1887, ch. 97.

[27] *Laws*, 1887, ch. 98.

[28] W. R. Hoag in Drainage Commission, *Report*. 1899, p. 16. *Crookston Times*, December 12, 1886, C. G. Elliott on the procedure in Illinois.

[29] *Laws*, 1887, ch. 99.

[30] This latter provision was added by ch. 168 of the Laws of 1889, which expressly repealed ch. 99 of the Laws of 1887, but substituted similar procedure.

[31] Governor McGill in his message of January 9, 1889 in *Executive Documents*, 1889, 1:37.

in that section were having difficulty with their wheat crops because of heavy frosts which were causing severe losses on account ot the wetness of the soil, and men from that section urged the legislature to give special assistance to those seeking to drain lands in that part of the state, but their efforts were unavailing in 1889 and 1891.[32]

Chapter 221 of the Laws of 1893 is worthy of considerable notice, not so much because of the things which it accomplished at that time, but because it was the germ of the present state drainage commission, which is of so great importance in the conduct of drainage operations in this state at the present time. By that act the legislature appropriated the sum of $25,000 a year for four years, to be expended in opening closed watercourses in eight counties of the Red River Valley. An amount equal to one fourth of this sum was to be contributed by the Great Northern Railway Company as an additional fund for the work, which was to be done under the supervision of a board of audit, consisting of the governor, secretary of state, one person named by the railroad company, and one person chosen by the chairmen of the boards of county commissioners of the counties concerned.[33] The railway company contributed its share of the money and its chief engineer served on the board of audit.[34] Further appropriations to continue the work of this commission were made by later legislatures.[35] By a subsequent act the board was to continue in existence until 1902.[36] And under a law of 1897, a board of state drainage commissioners was created. It consisted of three members appointed by the governor for three-year terms and serving without compensation. It was to have the care and control of all the ditches constructed under chapter 221 of the Laws of 1893, and chapter 164 of the Laws of 1895, that is, under the Red River Board of Audit; cause annual inspections of such works by a competent engineer; and require the county commissioners to keep them in repair and free from obstructions. Evidently this board was to attend to the details of the work while the Board of Audit was to attend to construction and financial matters.[37]

In 1901 the present state drainage commission was created, consisting of the governor, the secretary of state, and the state auditor, with practically the same powers and duties that it has at the present time.[38] Since these

[32] Governor Merriam in his message of January 9, 1889 in *Executive Documents*, 1889, 1:49; *Legislative Manual*, 1909, p. 314; Drainage Commission, *Report*, 1899.

[33] *Laws*, 1893, ch. 221.

[34] *Legislative Manual*, 1909, p. 314; Governor Nelson in his message of January 9, 1895, *Executive Documents*, 1894, 1:29.

[35] *Laws*, 1895, ch. 164; *Legislative Manual*, 1909, p. 314.

[36] *Laws*, 1897, ch. 142.

[37] *Laws*, 1897, ch. 318.

[38] *Laws*, 1901, ch. 90.

[39] Thus the approximate number of pages of drainage statutes enacted by the legislatures of 1905, 1907, 1909, and 1911 respectively are 46, 90, 50, and 43. In the session of 1907 there were fourteen separate acts passed relating to drainage.

powers and duties will be discussed in a later chapter dealing with the existing system and procedure, it is unnecessary to give them in detail at this point.

From 1901 to the present date every session of the legislature has seen the enactment of a constantly increasing number of drainage laws, because of a steadily increasing demand for lands in this state and a growing realization of the many advantages of land drainage and its profitableness. These statutes have made a great many changes in the laws as to details, and are so voluminous that to attempt to trace them in any detail would serve no purpose unless it would be to confuse the reader. Consequently, this discussion will be confined to a very brief reference to them. A list of such statutes may be found in Appendix 1, for the convenience of any person who may wish to pursue the matter further.[39]

An act of 1901, relating to county drainage, collected together in one act the previous enactments as to procedure through the county commissioners.[40] This was amended by a law of 1902, which provided a procedure to be followed whenever it was desired to extend a ditch into more than one county, such ditches to be constructed under the supervision of the judge of the district court of the judicial district in which such counties are located.[41] It will be remembered that the drainage act of 1883 attempted to meet the demand for machinery that could be used in constructing drains through several counties by providing for joint action by the county officers, who were to follow the procedure used in the establishment of county drains so far as possible. Doubtless such a plan was cumbersome, and it was difficult to secure prompt and harmonious action by the many officials involved, in the same way that a similar difficulty was met with in the procedure under the law of 1879 relating to action by several boards of town supervisors. Of course the revised laws of 1905 contained a compilation of all existing unrepealed laws on the subject,[42] but many details considered necessary by the legislature were omitted in the revision. Chapter 230 of the session laws of 1905 supplied these details and is practically the latest complete statute on the subject of drainage.[43] By an act of 1909 a procedure through township supervisors was authorized.[44] In addition to these acts there have been several curative acts.

To summarize briefly, then, the following were the chief steps in the development of drainage legislation in Minnesota:

1. Private drainage corporations authorized, 1858.
2. Procedure through justice of the peace, 1866.

[40] *Laws*, 1901, ch. 258.
[41] *Laws*, 1902, ch. 38.
[42] *Revised Laws*, 1905.
[43] *Laws*, 1905, ch. 230.
[44] *Laws*, 1909, ch. 127.

3. Drainage for highway purposes alone, with procedure through town supervisors, 1874.
4. For agricultural purposes, with procedure through town supervisors, 1877.
5. County commissioners may have town boards act together, if ditch is to extend into more than one town, 1879.
6. Procedure through county commissioners, 1883.
7. Permanent county drainage districts, 1887.
8. Red River Valley Board of Audit, 1893.
9. State drainage commission, 1901.
10. Judicial ditches, 1902.
11. Complete laws, chapter 230, 1905.
12. Procedure through town supervisors, 1909. (Revival of old procedure; similar, as to agency used, to law of 1877.)

Thus, we may trace the origin of the use of those agencies that are at the present time engaged in drainage work back to the following dates: the town, 1877; the county, 1883; the state drainage commission, 1893; the district court, 1902.

There is one fact that is apparent from the development of drainage laws in Minnesota, and that is, that, as drainage work has been developed, it has been found necessary to extend the ditches over larger and larger areas without regard to the artificial boundary lines of towns, counties, or judicial districts, so that the use of governmental agencies having ever greater territorial jurisdictions and more power and authority has been found to be advisable. Whether it is either desirable or probable that any still more powerful agent be used, will be discussed in another chapter.

CHAPTER VI

DRAINAGE PROCEDURE IN MINNESOTA

In Minnesota public drainage ditches may be established by procedure through any one of four agencies: (1) the town supervisors, (2) the county commissioners, (3) the district courts, (4) the state drainage commission. The steps to be taken in the construction of public drainage works through action by the county commissioners, are much the same as those necessary for the establishment of ditches by means of other governmental bodies, and the general outline and underlying principles of the county drainage law are typical of the drainage statutes of the state in general; so that this chapter will contain first a description of the procedure followed at the present time in establishing county drains. It will then point out the principal differences between such procedure and that followed in the laying-out of town, judicial, and state ditches, as well as the general principles embodied in the drainage statutes and decisions of the state courts relative to procedure in general.

Before the county board can establish any ditch or drain, a petition must be filed with the county auditor, signed by one or more of the landowners whose lands are liable to be affected by, or assessed for, the expense of the construction of the same, or by the supervisors of any township or the officers of the council of any city or village, or by the duly authorized agent of any public institution, corporation, or railroad, whose lands are liable to be affected by, or assessed for, the expense of the construction of the proposed ditch, or by the state board of control. Such petition must set forth the necessity of such a drain and state that it will be of public benefit or promote the public health, and must also contain a description of the proposed starting-point, routes, and termini.[1] It must be accompanied

[1] In the petition it is sufficient that the starting-point, course, and terminus be stated with approximate accuracy, the board in ordering the construction of a ditch being finally guided by the description as contained in the surveyor's report. State *v.* Polk County, 87 *Minnesota,* 325 (1902); State *v.* Lindig, 96 *Minnesota,* 419, 421 (1903); Johnson *v.* Morrison County, 107 *Minnesota,* 87, 89 (1909). See State *v.* Watts, 116 *Minnesota,* 326 (1911). Showing of petition as to health and public benefit need not be in language of statute. State *v.* Watts, 116 *Minnesota,* 326, 327 (1911). Technical nicety of description in ditch proceedings not required, nor language such that every layman may trace the ditch upon the ground. Dictum in Slingerland *v.* Grant County, 113 *Minnesota,* 214, 216 (1911). A petition need not describe the land by subdivisions to correspond with individual ownership. If an entire section is within a district it may be described as a section, though the subdivisions are owned by different persons. State *v.* Quinn, 108 *Minnesota,* 528 (1909). The proceedings are purely statutory. Lager *v.* Sibley County, 100 *Minnesota,* 85, 86 (1907), and in invitum. Curran *v.* Sibley County, 47 *Minnesota,* 313 (1891); and in rem. McMillan *v.* Freeborn County, 93 *Minnesota,* 16, 22 (1904).

by a bond conditioned to pay all expenses in case the county board shall fail to establish the ditch petitioned for.[2]

Notice of the filing of the petition, and of the time and place of the hearing thereon, must then be given by the county auditor by publication for three successive weeks in a newspaper published and printed in that county and by posting for at least three weeks in three public places in each township where the proposed work is located and at the door of the courthouse. Printed copies must also be mailed to all non-residents of the county whose lands lie within two miles on either side of the routes specified in the petition and whose addresses are known to the auditor or can be ascertained by inquiry at the county treasurer's office.

The county board, when it is satisfied that all of these steps have been taken, appoints "a competent and experienced civil engineer,"[3] whose duty it is to make a survey of the line of the proposed drain, estimate the number of yards of earth to be excavated, the cost of excavation per yard and of construction work considered necessary, such as flumes and masonry, and the total cost of laying out the whole work, including preliminary expenses. The engineer is also to furnish the general specifications for doing the work, and to make out a form of contract which shall give him the right, with the consent of the county auditor, to modify his plans and specifications as the work proceeds, "provided that no changes are made that will substantially impair the usefulness of any part of the ditch, or substantially alter its original character or increase its total cost by more than ten per centum." Under certain circumstances the engineer may vary somewhat from the line specified in the petition. In case the route proposed is along public highways, he is to prescribe such a disposition of the excavated matter as will improve such highways; and, so far as practicable, he is to locate the ditch on division lines between lands owned by different persons, and to avoid constructing it diagonally across lands, but he is not to "sacrifice the general utility of the ditch to avoid diagonal lines." Before entering on his duties, the engineer is required to give bonds to the county in the sum of $5,000 for the use of the county, or for the indemnification of all persons injured by any negligence or malfeasance on his part while acting in the establishing of the ditch. The results of the engineer's work are to be set

[2] Where petitioners did not sign bond and there was failure to establish ditch, they were not liable for preliminary expenses paid by county even though they signed petitions. McLeod County *v.* Nutter, 111 *Minnesota,* 345 (1910). Where five petitioners for ditch signed bond as principals each is liable to pay one fifth of preliminary expenses, regardless of the benefit which it appears from viewers' report he would have received had ditch been constructed. Gugisberg *v.* Eckert, 101 *Minnesota,* 176 (1907) (bond under *Laws,* 1901, ch. 258). Obligors not liable where order establishing ditch was set aside for irregularity; bond not designed to indemnify county against failure of its officers to comply with the law (bond under *Laws,* 1901, ch. 258). Freeborn County *v.* Helle, 105 *Minnesota, 92* (1908).

[3] *Laws,* 1905, ch. 230, sec. 3; amended by *Laws,* 1907, ch. 367, sec. 1, *Laws,* 1909, ch. 469, sec. 2, *Laws,* 1911, ch. 384, sec. 1. (*Laws,* 1905, ch. 311, was repealed by *Laws,* 1907, ch. 367, sec. 11.)

forth in a detailed and tabulated report to be made to the board of county commissioners, and filed with the county auditor.[4]

At the same session of the county board at which the engineer is appointed, or within at least ten days thereafter, the board selects three resident freeholders of the county, "not interested in the construction of the proposed work, and not of kin to any of the parties known to be interested therein," to act as viewers. These viewers then make a tabular statement showing the names of the owners of each tract to be benefited or damaged, the description of each tract benefited or injured, the amount of damage or benefit to each, the damage, if any, to riparian rights, the estimated benefits to public and corporate roads, roadbeds, or railroads, the damages awarded to natural and artificial persons, and the total estimated benefits in respect to the entire ditch and branches. They also report "whether or not, in their opinion, the estimated expense of the construction of such ditch, including the damages awarded therefor, are greater than the utility of the proposed ditch, or that the construction of such ditch is impracticable for any reason, stating the reason why it should not be constructed."[5] All lands benefited are to be assessed in proportion to the benefits received from the construction of the ditch, whether or not it passes through such lands; and all lands owned by the state or any of its departments are liable to assessment in the same way as taxable property.[6] The report of the viewers must be filed with the county auditor, and all their duties performed within thirty days from their first meeting,[7] which meeting must be held within fifteen days after the filing of the engineer's report.[8]

Upon the filing of the viewers' report, a special meeting of the board of county commissioners is held, at least three weeks' notice having been given in much the same manner as the notice of the petition and of the first meeting of the board. At this second meeting the county board hears and considers the petition, and the reports of the engineer and viewers. All per-

[4] *Laws*, 1905, ch. 230, sec. 4; amended by *Laws*, 1911, ch. 384, sec. 2. *Laws*, 1905, ch. 230, sec. 5; amended by *Laws*, 1909, ch. 469 sec. 3. A change by the engineer in starting point even if not authorized by *Laws*, 1905, ch. 230, sec. 4, is no defense to proceedings to obtain judgment for assessment lien. State *v.* Tuck, 112 *Minnesota*, 493 (1910), following State *v.* Johnson, 111 *Minnesota*, 255 (1910). For authority of engineer to lay out proposed ditch along practicable lines, see State *v.* Watts, 116 *Minnesota*, 326 (1911). In State *v.* District Court, 114 *Minnesota*, 424 (1911) (a judicial ditch) court held notices of first hearing properly posted, although in only one town, it appearing that proposed ditch was wholly located in that town.

[5] *Laws*, 1905, ch. 230, sec. 6; amended by *Laws*, 1909, ch. 469, sec. 4. Provisions directing board to appoint viewers within specified time are directory merely, and neglect strictly to comply therewith does not invalidate the proceedings. McMillan *v.* Freeborn County, 93 *Minnesota*, 16 (1904), under *Laws*, 1901, ch. 258.

[6] *Laws*, 1905, ch. 230, sec. 7; amended by *Laws*, 1905, ch. 469, sec. 5. The sum of $5,000 per year, beginning with 1905, was appropriated out of the general revenue fund of the state to pay assessments against state lands which might be levied under authority of the above statutes. *Laws*, 1905, ch. 230, sec. 24; *Laws*, 1909, ch. 469, sec. 5.

[7] Delay in viewers' report necessarily caused by high water, inclement weather, or unavoidable accident may be excused by county commissioners. *Laws*, 1905, ch. 230, sec. 8.

[8] *Laws*, 1905, ch. 230, sec. 6; amended by *Laws*, 1909, ch. 469, sec. 4.

sons interested may appear before the county commissioners and be heard by them. The county board may resubmit to the engineer or viewers for reconsideration the matters originally reported upon by them, or amend their respective reports.[9] If the board finds that the engineer's and the viewers' reports, and all other proceedings in the matter have been made and had in accordance with the statutory provisions, and that the estimated benefits to be derived from the construction of the work are greater than its total costs, including damages awarded, and that such damages and benefits have been duly awarded and assessed, and that the proposed work will be of public utility or benefit or promote the public health, and that the reports are complete and correct, it establishes the ditch as specified in the report of the civil engineer, and confirms the report of the viewers.[10]

In its final order establishing the ditch the county board is limited to the description thereof as set forth in the petition, subject to such reasonable departures in the course, distance, and termini as are necessary to render the improvement of practical utility. An extension of a proposed ditch for a distance of seven miles, for example, beyond the terminus named in the petition, is unauthorized where the length of the ditch as originally petitioned for is only four miles.[11] A radical departure by the engineers and county commissioners from the line of a public ditch as demanded in the petition may render the order of the county commissioners laying out the ditch and all subsequent proceedings void, and the abandonment of terminus as petitioned for and its establishment on the land of a private owner when the petition designates a proper outlet is unwarranted.[12] And if waters are to be diverted from their natural course, the ditch must follow the general direction of the water-course and terminate therein whenever it is practicable to do so; although there may be a reasonable departure where such is necessary to secure a practicable drain.[13] The order establishing the ditch must in itself, or by reference to the viewers' report, which is itself sufficient, definitely locate the ditch, by giving the proper starting point, route, and terminus.[14]

[9] *Laws*, 1905, ch. 230, sec. 9; amended by *Laws*, 1907, ch. 367, sec. 21, and *Laws*, 1911, ch. 384, sec. 3. Heinz *v.* Buckham, 104 *Minnesota*, 389 (1908).

[10] *Laws*, 1905, ch. 230, sec. 10; amended by *Laws*, 1911, ch. 384, sec. 4. So also the court in judicial proceedings at second hearing is required to determine the utility of the proposed ditch. And the fact that the petitioners have expended money on faith of the first determination will not prevent the court from differing in its conclusion at the second and final hearing from that at the first or preliminary hearing and determination. Wheeler *v.* Almond, 110 *Minnesota*, 503 (1910).

[11] Lager *v.* Sibley County, 100 *Minnesota*, 85 (1907), under *Laws*, 1905, ch. 230.

[12] Jurries *v.* Virgens, 104 *Minnesota*, 71 (1908), under *Laws*, 1901, ch. 258, sec. 3.

[13] State *v.* Baxter, 104 *Minnesota*, 364 (1908), under *Laws*, 1905, ch. 230, sec. 1.

[14] Johnson *v.* Morrison County, 107 *Minnesota*, 87 (1909), under *Laws*, 1905, ch. 230, sec. 10. Order laying out ditches sustained on certiorari against objection that the drainage district was unlawfully split; that as good or better drainage could be obtained by other routes at less expense, and with less, if any, damages; and that the ditch ordered was inadequate to its responsibilities. State *v.* Buckham, 108 *Minnesota*, 8 (1909). See also Slingerland *v.* Conn, 113 *Minnesota*, 214 (1911), State *v.* Watts, 116 *Minnesota*, 326 (1911), Gourd *v.* Morrison County, 118 *Minnesota*, 294 (1912). For case relating to sufficiency of evidence to support certain finding that certain lands were damaged, see Backus *v.* Conroy, 104 *Minnesota*, 242 (1908).

Within ten days after the filing in the office of the county auditor of the order establishing the ditch, such auditor sells the jobs of digging and constructing the entire work either as one job, or in linear sections of one hundred feet each. Notice of the letting of the work, and requests for bids must be published in the official newspaper of the county for three successive weeks, but no bid is to be entertained which exceeds the estimated cost by more than thirty per cent. The engineer attends to the letting of the work, and no bid can be accepted by the auditor without the approval of such engineer as to the compliance of the bid with the plans and specifications. The auditor enters into the contract with the lowest responsible bidder,[15] but such contract must require the work to be done according to the report, plans, and specifications of the engineer, and subject to his approval and that of the county auditor, and must be drawn to the satisfaction of the engineer and of the county attorney.[16] The contractor must furnish a bond in the penal sum of not less than the contract price, conditioned that he will faithfully perform his contract and pay all damages which may accrue by reason of the failure to complete the work in the manner and within the time required in the contract. Of course the contract by the auditor is in the name of the county.[17] On compliance with certain statutory conditions, the contract may be altered, or the time for completing the drain extended. In case of default, the jobs may be resold.[18] Whenever any contractor has completed his job, the work is inspected by the engineer, and, if he finds that the contract has been performed according to the plans and specifications, he reports that fact to the county board and gives the contractor a certificate stating that such work has been properly finished. Certificates showing partial performance may also be issued during the progress of construction under certain statutory restrictions, one being that those for work done shall not exceed seventy-five per cent of its total value, nor those for materials or supplies more than fifty per cent of their total value.[19] These certificates become prima facie evidence of the completion of the work only after approval by the county board, and they may be exchanged for warrants due and payable at once out of the general ditch fund of the county.[20]

[15] *Laws*, 1905, ch. 230, sec. 4.

[16] *Laws*, 1905, ch. 230, sec. 15; amended by *Laws*, 1911, ch. 384, sec. 7, and *Laws*, 1911, ch. 568, and *Laws*, 1913, ch. 578, sec. 1.

[17] *Laws*, 1905, ch. 230, sec. 14. Landowner is entitled to sue on a bond of contractor, (under *Laws*, 1902, ch. 38, sec. 10), Eidsvik *v.* Foley, 99 *Minnesota*, 468 (1906). Owners of land in a drainage district are not entitled to recover from the contractor and his bondsmen for a loss of profits arising from failure to complete ditch within the time specified (under *Laws*, 1901, ch. 258), Grams v. Murphy, 103 *Minnesota*, 219 (1908).

[18] *Laws*, 1905, ch. 230, secs. 15 and 16; amended by *Laws*, 1911, ch. 384, sec. 7, *Laws*, 1913, ch. 568, and *Laws*, 1913, ch. 578, sec. 1. *Laws*, 1913, ch. 22, secs. 1 and 2.

[19] There is an exception as to maximum percentages with reference to contracts involving more than $30,000.

[20] *Laws*, 1905, ch. 230, sec. 17; amended by *Laws*, 1909, ch. 469, sec. 6, *Laws*, 1911, ch. 384, sec. 13, and *Laws*, 1913, ch. 567, sec. 1. Under the act of 1887 it has been held that the authority

When damages are awarded to any person or corporation in excess of benefits, warrants are issued at the expiration of the time allowed for appeals to the courts, and these warrants become due and payable immediately after the letting of the contracts. In order to meet the expenses of constructing the drain, the county commissioners issue the bonds of the county, in terms not exceeding twenty years, and bearing interest at the rate of not more than six per cent per annum. The proceeds derived from the sale of these bonds are placed in, and constitute the general ditch fund of the county.[21] Thus, the moneys used for the payment of damages awarded and of the warrants which are given to the contractor in exchange for the engineer's certificates of completed work are derived in the first instance from the sale of county bonds.

As soon as possible after the letting of the contract, the county auditor

of the county surveyor is limited to inspecting the work of the contractor, when completed, and, if he finds the same in accordance with the specifications of the viewers, to accept it and give the contractor a certificate of acceptance, and that he has no right to authorize the contractor to incur extra expenses which are not embraced within the original specifications; that the cost of ditch work must be assessed against property benefited so that the board has no authority to incur any liability on behalf of the county for material or services; and that even though the board accepts a ditch as complete, knowing that the contractor by direction of the county surveyor has spent money not embraced by specifications yet such acceptance does not make the county liable therefor. Bowler *v.* Renville County, 105 *Minnesota,* 26 (1908). Partial payments may be made without approval of county board (under *Laws* 1905, ch. 230, sec. 17). Moody *v.* Brasie, 104 *Minnesota,* 463 (1908). Mere irregularity in the award of contract has been held not to defeat a recovery against the county. Interstate Drainage and Investment Company *v.* Freeborn County, 158 *Federal Reports,* 270 (1907). For case holding that the engineer's estimate is not the basis of the bid; that an action by contractor lies against the county to reform a contract for mutual mistake of parties thereto, such action not being considered as one against the county for an error by one of its officers in the exercise of governmental functions, see Mulgrew *v.* Freeborn County, 112 *Minnesota,* 5 (1910). In awarding contract to "lowest responsible bidder" auditor is not limited to consideration of financial responsibility of bidder but may exercise sound discretion and consider fitness and ability of bidder to do the particular work, so that award to one not lowest bidder may be sustained if sufficient reason therefor. Kelling *v.* Edwards, 116 *Minnesota,* 484 (1912). Approval of certificates is condition precedent to issue of warrants by auditor and board can not be controlled in approval by mandamus, contractor's remedy being a suit on the contract. State *v.* Clarke, 112 *Minnesota,* 516 (1910). In such case contractor is not required to resort to certiorari to review refusal of board to approve; *Revised Laws,* 1905, sec. 620, requiring presentment to board of claims against county as condition precedent to suit against county is not applicable to the final payment due contractor in drainage proceedings. Merz *v.* Wright County, 114 *Minnesota,* 448 (1911).

[21] *Laws,* 1905, ch. 230, sec. 18; amended by *Laws,* 1907, ch. 367, sec. 3 and *Laws,* 1909, ch. 469, sec. 7. The bonds issued by the county are the direct and general obligations of the county, and its auditor and board can not be restrained from issuing bonds in such form on the ground that the legislature intended the lands assessed to be the security, and not the county itself, or that if the legislature intended the latter it had no power to do so. "To bring the best price and a ready sale, bonds must be issued by an obligor whose responsibility is readily ascertainable and undoubted. . . . . Prospective purchasers of bonds might well be turned away, if the law is that the only security is the assessments against benefited property." And as to the power of the legislature the court said: "The construction of drainage ditches being the exercise of a governmental function, delegated to the counties of the state for the promotion of public health, welfare, and utility, there ought to be no doubt that all the property within the county may be subject to taxation to provide the funds therefor. That most, or part, of this burden is laid on property specially benefited is no reason why the owners of other property thus relieved should have any warrant for claiming that the law violates any of their constitutional rights. In other words, the legislature may provide different taxing districts within a county, and is not bound by governmental subdivisions therein." Van Pelt *v.* Bertilrud, 117 *Minnesota,* 50 (1912).

makes out a tabulated statement showing (1) the names of the owners of the lands, roads, and railroads benefited, (2) a description of these lands, (3) the number of acres benefited in each tract, (4) the amount of benefits to each tract of land, road, and railroad, as well as of the damages thereto, (5) the amount that each of these lands, roads, and railroads so benefited will be required to pay towards the cost of constructing the drain.[22] This statement is then filed with, and recorded by, the register of deeds of the county, and the amount which each tract of land, public or corporate road or railroad, is liable for, together with interest thereon not exceeding six per cent, constitutes a paramount lien on such property until paid, and takes precedence of all mortgages, charges, incumbrances, or other liens of any kind.[23] These liens are to be paid off in ten equal annual installments, but the county board in its discretion may provide for fifteen of such payments. These liens are collected at the same time of the year and in the same manner as real estate taxes,[24] except that in the case of railroads they are collectible in the same way as personal taxes.[25] Thus, the bonds of the county are issued only for the purpose of supplying the funds that are needed at once for the construction of the ditch and the payment of damages, and for the purpose of lightening the burden of persons assessed for benefits by enabling them to pay such obligations in installments. The bonds issued are retired by the persons for whose benefit they were originally issued.

[22] *Laws*, 1905, ch. 230, sec. 19.

[23] *Laws*, 1905, ch. 230, sec. 20. The amount charged against each tract of land bears interest at not more than six per cent as fixed by the county board which must make the interest rate the same as that on bonds issued. (*Laws*, 1905, ch. 230, sec. 11; amended by *Laws*, 1911, ch. 384, sec. 12).

[24] *Laws*, 1905, ch. 230, sec. 22; amended by *Laws*, 1909, ch. 469, sec. 8.

[25] *Laws*, 1905, ch. 230, sec. 25; amended by *Laws*, 1909, ch. 469, sec. 9. The duty of the county auditor to file the lien statement is mandatory, and no other and speedy remedy at law being available he may be compelled by mandamus to file such statement, or correct an insufficient one so as to protect the county. State *v.* Johnson, 111 *Minnesota*, 10 (1910). (Same case held a delay of four years in filing such statement was not fatal to the rights of the county.) It has been held under *General Statutes*, 1894, secs. 7810, 7811, that the lien attaches at the time provided in the statute, and the privilege given the landowner to pay the same in installments does not change the character of such lien, nor control the time when the lien takes place, which is upon the filing of the lien statement by the auditor; that the provisions of *General Statutes*, 1894, sec. 1623 for the attachment of liens for ordinary taxes as between the state and the landowner as well as between grantor and grantee, do not affect or control the assessments provided for in the state drainage laws by virtue of the fact that such assessments are collected in the same manner as ordinary taxes; and that the liens provided for in sec. 1623 and in sec. 7811 are distinct, created for different purposes, attach at different times, and impose different conditions upon the landowner under a covenant against incumbrances upon the sale of the land by him. Clapp *v.* Minnesota Grass Twine Company, 81 *Minnesota*, 511 (1900). And under *Laws*, 1901, ch. 258, it was held that recording of assessment list and statement is essential to the creation of a lien. Meeker County *v.* Schultz, 110 *Minnesota*, 405 (1910). Prior to May 20, 1908, land of the United States entered as a homestead, but not finally proved as such, was not subject to the lien of a drainage assessment. State *v.* Johnson, 111 *Minnesota*, 255 (1910). Where in proceedings to enforce a delinquent tax on real estate a defense is made to an installment for ditch assessment included therein on ground that proceedings establishing ditch are void, and a judgment is entered discharging land from such tax, such judgment is res judicata as to the enforceableness of subsequent installments; and landowner can compel county to remove cloud on his title raised by the apparent lien of the whole ditch assessment. Lindberg *v.* Morrison County, 116 *Minnesota*, 504 (1912).

It is evident that great care is necessary in determining the principles to be followed in assessing land for benefits received, because of constitutional restrictions which might result in the courts holding the statutory provisions relative to such assessments invalid as inconsistent with the constitution of the state. The constitutional amendment authorizing the legislature to empower "municipal corporations" to levy assessments for local improvements, without regard to the cash valuation of property assessed, has been held to authorize such legislation with respect to the powers of counties in drainage matters, so that costs of drains may be secured by assessments in accordance with benefits received.[26] And, as we have already pointed out, the legislature may, in the enactment of laws providing for public improvements in the interests of public health, convenience, and comfort, provide that the cost and expense of such improvements be assessed against lands benefited and improved thereby, such assessments not being open to the objection that they result in unequal taxation.[27] But a statute providing in effect, that the owners of lands benefited by the construction of a new ditch and its connection with a ditch already established, for which their lands were not assessed, shall pay into the county treasury the same proportion of benefits received by their lands, that the lands assessed for the original ditch were forced to pay, is unconstitutional, since it deprives a class of landowners of their property for a public purpose without any compensation and without due process of law.[28] So that it is clear that great care must be taken in drawing and applying rules relating to assessments so as to avoid any arbitrary method of determining the amount of benefits received by an individual landowner. Although all lands benefited by a given ditch in whole or in part are to be charged in proportion to actual benefits received, yet it is not necessary in order to assess a given tract of land that the ditch pass through such tract; it is sufficient that it receives a benefit. But only *direct* benefits from the ditch in question can be considered, and not the benefits which the land may or will receive after some other and different ditch is constructed.[29] An allowance should be made for any damage to the riparian rights of the landowner against whom an assessment is made, as well as for any private ditch which he may have already constructed, and which can or will be used in the public ditch so as to decrease the cost of the latter.[30] The amount any land shall be liable for on account of the drain shall in no case exceed the benefits which will accrue thereto from the building of

[26] Dowlan *v.* Sibley County, 36 *Minnesota*, 430 (1887).

[27] Lien *v.* Norman County, 80 *Minnesota*, 58 (1900). See also Swenson *v.* Hallock, 95 *Minnesota*, 161 (1905) and Gourd *v.* Morrison County, 118 *Minnesota*, 294 (1912).

[28] Lyon County *v.* Lien, 105 *Minnesota*, 55 (1908). *Laws*, 1907, ch. 48, sec. 40. See also p. 58 *supra* and notes thereto.

[29] *Laws*, 1905, ch. 230, sec. 7; amended by *Laws*, 1909, ch. 469, sec. 5.

[30] *Laws*, 1905, ch. 230, sec. 6; amended by *Laws*, 1909, ch. 469, sec. 4.

such drain.[31] After the ditch has been opened, it is kept in repair and free from obstructions by the county board, the costs of such work being paid out of the general revenue funds of the county, which funds are reimbursed by assessments on lands charged for the construction of the drain in the same proportion as the original assessments.[32] And the county commissioners, after a report from viewers, may compensate persons whose lands have been damaged subsequent to the construction of a ditch, who were not paid for such damages in the original award of damages, provided a petition to that effect is presented to the board within six years after the completion of the ditch.[33] Ordinary repairs may be made without any notice.[34]

The statutes relating to the procedure to be followed in the establishment of ditches contain many provisions designed to protect landowners; and such owners have been further safeguarded in their rights by the recognition on the part of the courts of certain remedies under the common law, or without express provision therefor in the drainage statutes themselves. Furthermore, it is worthy of note, that the rule that the public drain acts of the state are to be liberally construed[35] so as to promote the reclamation of swamp lands, does not mean that exact compliance with the statutory provisions relating to such steps in procedure as notices, petitions, and public hearings, can be to any degree dispensed with; on the contrary, the courts have held that all statutory provisions which are designed for the protection of landowners must be strictly complied with, and failure to do so may render the proceedings void as to owners whose rights have been prejudiced.[36] Thus, it has been held that a petition in proper form is a jurisdictional prerequisite to the authority of the county commissioners to entertain any pro-

[31] *Laws*, 1905, ch. 230, sec. 38. The right-of-way of a railway company, paying a gross earnings tax in lieu of all taxes and all assessments as provided in *Special Laws*, 1873, ch. 111, is exempt from assessments for special benefits thereto from a public ditch. Patterson *v.* Chicago, Milwaukee and St. Paul Railway, 99 *Minnesota*, 454 (1906).

[32] *Laws*, 1905, ch. 230, sec. 26; amended by *Laws*, 1907, ch. 367, sec. 4, and *Laws*, 1909, ch. 469, sec. 10, and *Laws*, 1911, ch. 384, sec. 8, and *Laws*, 1913, ch. 179, sec. 1. Part of *Laws*, 1905, ch. 230, sec. 26 was held unconstitutional in State *v.* McGuire, 109 *Minnesota*, 88 (1909). But this was as to enlargement of ditches without notice, and not mere repairs. Consequently above statement still holds true. Wilful or negligent obstruction of diches or injury thereto is a misdemeanor. *Laws*, 1905, ch. 230, sec. 43; amended by *Laws*, 1907, ch. 367, sec. 7. But in a prosecution for obstructing a drain, it was held error to admit an order establishing the drain since it was void because of insufficiency of description. State *v.* Lindig, 96 *Minnesota*, 419 (1905). An action will lie against a town for obstructing a ditch. Rasmussen *v.* Hutchinson, 111 *Minnesota*, 457 (1910). Since the power to assess property for local improvements is a continuing one, it may be exercised to cover the cost of maintaining a ditch. McMillan *v.* Freeborn County, 93 *Minnesota*, 16 (1904).

[33] *Laws*, 1905, ch. 230, secs. 39-41.

[34] State *v.* McGuire, 109 *Minnesota*, 88 (1909). See also State *v.* McGuire, 114 *Minnesota*, 281 (1911).

[35] *Laws*, 1905, ch. 230, sec. 47. *Laws*, 1907, ch. 470, sec. 33. State *v.* Polk County, 87 *Minnesota*, 325 (1902). State *v.* Isanti County, 98 *Minnesota*, 89 (1906). Backus *v.* Conroy, 104 *Minnesota*, 242, 246 (1908). State *v.* Baxter, 104 *Minnesota*, 364, 366 (1908). Interstate Drainage and Investment Company *v.* Freeborn County, 158 *Federal Reports*, 270 (1907).

[36] Curran *v.* Sibley County, 47 *Minnesota*, 313 (1891). Lager *v.* Sibley County, 100 *Minnesota*, 85 (1907). See also McMillan *v.* Freeborn County, 93 *Minnesota*, 16 (1904).

ceedings for the establishment of a ditch;[37] that the notice of the time set for the hearing of the petition and of the report of the viewers is likewise jurisdictional, and must be given in accordance with the provisions of the statutes before the board can proceed; that the publication of the notice for three weeks or twenty-one days must be fully completed before the day fixed for the hearing;[38] and where, at the first hearing, an engineer and viewers have been appointed and reports required from them, notice of the second and final hearing must be given and an opportunity afforded to parties interested to support by competent evidence valid objections to the laying-out of the ditch.[39] And the statutory provisions relating to parties are to be liberally construed, so that the right of landowners affected to appear before the county board and be heard by it is not confined to those who are strictly parties to the drainage proceedings, but extends to landowners with a well-grounded claim for damages, resulting from the construction of the drain even though it may not certainly appear that such damages are recoverable at law.[40]

Not only are landowners protected by the necessity for proper petitions, notices, and hearings, but they may also protect and enforce their rights by appeals to the courts of the state including the supreme court; by injunctions; and by certiorari. The statute provides that any person or corporation aggrieved thereby may appeal from an order of the county commissioners determining either of the following matters: (1) the amount of benefits to any tract of land or any public or corporate road or railroad, (2) the amount of damages allowed to any person, persons, or corporation, or assessed to any tract of land, (3) refusing to establish a proposed ditch. As might be expected, notice of the appeal, and bond conditioned duly to prosecute the appeal and pay all costs adjudged against the appellant and to abide the decision of the court, must also be filed. Any person deeming himself aggrieved in the assessment of his damages or the estimate as to his benefits may demand a jury trial to determine the correctness of such assessments and allowance. The issues raised by such a demand stand for trial at the next term of the district court, and take precedence over all matters of a civil character in that court.[41] Appeals from any final appealable order, except the order establishing the ditch, may be carried to the

[37] State *v.* Polk County, 87 *Minnesota,* 325 (1902). State *v.* Watts, 116 *Minnesota,* 326, 328 (1911). Johnson *v.* Morrison County, 107 *Minnesota,* 87, 88 (1909).

[38] Curran *v.* Sibley County, 47 *Minnesota,* 313 (1891). Johnson *v.* Morrison County, 107 *Minnesota,* 87, 89 (1909). State *v.* District Court, 114 *Minnesota,* 424 (1911).

[39] Heinz *v.* Buckham, 104 *Minnesota,* 389 (1908), (under *Laws,* 1907, ch. 448).

[40] State *v.* Isanti County, 98 *Minnesota,* 89 (1906). See also Billsborrow *v.* Pierce, 101 *Minnesota,* 271 (1907).

[41] *Laws,* 1905, ch. 230, sec. 12; amended by *Laws,* 1911, ch. 384, sec. 6. An appeal from an order of a county board laying out a ditch, does not bring up for review the question of whether the board has exceeded its authority by establishing the ditch so as to drain a public meandered lake. Dressen *v.* Nicollet County, 76 *Minnesota,* 290 (1899). (This was under *Laws,* 1887, ch. 97, sec. 11.) An informal notice of appeal and bond under *Laws,* 1887, was sustained in Ander-

supreme court of the state by filing the notice of appeal and the bond required as in civil actions upon an appeal to that court.[42] Where no provision is made for an appeal, certiorari is a proper remedy to secure a judicial review of drainage proceedings.[43] Thus, it has been held that, since the statutes provide no appeal from an order of the county commissioners laying out a ditch, certiorari may be resorted to as a remedy by the landowner.[44] And an injunction will lie to restrain drainage proceedings where a landowner is without an adequate legal remedy;[45] but if he has such a remedy, the rule is otherwise, and he can not resort to the use of injunction.[46] If he uses neither certiorari, injunction, nor his right to appeal upon

son *v.* Meeker County, 46 *Minnesota,* 237 (1891). A notice of appeal, otherwise specific, directed to a county board, is sufficient in form, and, after bond filed, operates to perfect an appeal to the district court from an order of said board dismissing an application for the establishment and construction of drainage ditches made pursuant to *Laws,* 1901, ch. 258, as amended, and vests the district court with jurisdiction. This jurisdiction upon appeal extends to a trial de novo of all issues, both of fact and law. McMillan *v.* Freeborn County, 93 *Minnesota,* 16 (1904). Schumacher *v.* Wright County, 97 *Minnesota,* 74 (1906). As to remedy by appeal, see also State *v.* Johnson, 111 *Minnesota,* 255 (1910). The right of appeal is unaffected by a failure of the auditor to file the lien statement. State *v.* Johnson, 111 *Minnesota,* 10 (1910). (As to time when time to appeal begins to run see same case.) Not only is appeal to district court to be conducted in the same way as a trial de novo, but even the findings of the board are to be given no special or particular force or effect. Madsen *v.* Larson, 117 *Minnesota,* 369 (1912). Where appeal is tried in court of county other than one in which proceedings were instituted verdict of jury or order of court is final in that court and no judgment thereon is necessary. And right of appeal is limited to persons aggrieved or claiming damages, not necessarily including ditch petitioners merely because they petitioned. The assessment of viewers is prima facie correct and one appealing has burden of proof. State *v.* Nelson, 116 *Minnesota,* 424 (1912).

[42] *Laws,* 1905, ch. 230; amended by Laws, 1909, ch. 469, sec. 13. *Laws,* 1905, ch. 51. An order of the court on appeal from the assessment of damages in ditch proceedings under *Laws,* 1905, ch. 230, assessing the appellant's damages and directing judgment to be entered accordingly, is not a final appealable order within the terms of the statute. Prahl *v.* Brown County, 104 *Minnesota,* 227 (1908). No appeal lies from a judgment establishing a county ditch, since *Laws,* 1905, ch. 230, sec. 41, does not apply except to proceedings for assessing damages arising after construction of ditch. Aspelin *v.* Murray County, 115 *Minnesota,* 440 (1911). A judgment of the district court, upon appeal, affirming the order of commissioners in assessment proceedings, is not defective, because the lands affected are not described therein, if they are sufficiently described in other parts of the record. Dowlan *v.* Sibley County, 36 *Minnesota,* 430 (1887). See also Lindbergh *v.* Morrison County, 116 *Minnesota,* 504 (1912).

[43] Dressen *v.* Nicollet County, 76 *Minnesota,* 290, 291 (1899). Schumacher *v.* Wright County, 97 *Minnesota,* 74, 75 (1906). State *v.* Isanti County, 98 *Minnesota,* 89 (1906). Billsborrow *v.* Pierce, 101 *Minnesota,* 271 (1907). Heinz *v.* Buckham, 104 *Minnesota,* 389 (1908). State *v.* Posz, 106 *Minnesota,* 197 (1908). State *v.* Buckham, 108 *Minnesota,* 8 (1909). State *v.* Johnson, 111 *Minnesota,* 255 (1910). State *v.* Nelson, 116 *Minnesota,* 424 (1909). But a contractor is not required to resort to certiorari to review refusal of county board to approve final certificate of engineer, but may sue the county in direct action. Merz *v.* Wright County, 114 *Minnesota,* 448 (1911).

[44] State *v.* Posz, 106 *Minnesota,* 197 (1908).

[45] Dressen *v.* Nicollet County, 76 *Minnesota,* 290, 291 (1899). Billsborrow *v.* Pierce, 101 *Minnesota,* 271 (1907). Miller *v.* Jensen, 102 *Minnesota,* 391 (1907). Jurries *v.* Virgens, 104 *Minnesota,* 71 (1908). Johnson *v.* Morrison County, 107 *Minnesota,* 87 (1909). In Billsborrow *v.* Pierce, 101 *Minnesota,* 271 (1907), the court allowed injunction over objections that certiorari was the proper remedy, pointing out that the latter procedure does not permit an investigation into matters outside the record, may shut out interested parties, and is inadequate to protect against anticipated injury. See also Billsborrow *v.* Pierce, 112 *Minnesota,* 336 (1910). State *v.* Johnson, 111 *Minnesota,* 255 (1910). Kelling *v.* Edwards, 116 *Minnesota,* 484 (1912).

[46] Schumacher *v.* Wright County, 97 *Minnesota,* 74 (1906). Slingerland *v.* Conn, 113 *Minnesota,* 214 (1911). Johnson *v.* State, 111 *Minnesota,* 255, 261 (1910). Jacobson *v.* Lac qui Parle County, 119 *Minnesota,* 14 (1912). Temporary injunction held properly denied, and question raised as to

the statutory grounds, he has one means left to protect his rights, and that is to become delinquent in his payments of the assessments, whereupon, since these are collectible like ordinary taxes, an application will be made for a judgment against him for the amount of such delinquent taxes, and he may come in and oppose such application.[47] But in such a case he is confined to those defenses which are permitted under the statutes relating to applications for judgment for delinquent taxes in general (that is, that they have been partially or unfairly assessed, or have been paid, or that the property was not subject to taxation);[48] and he can not at that time avail himself of an insufficiency in the order establishing the ditch,[49] or a change in the starting point of the ditch, not authorized by the county board.[50]

Thus, it appears that the chief steps in the establishment of a public drain through the county commissioners are the petition, appointment of engineer and viewers after notice and hearing, reports of engineer and viewers, hearing thereon, order establishing the ditch, assessments of benefits and damages, letting of contracts, bond issues, approval of work done, and collection of assessments to pay off bonds.

Not only may a drainage ditch be established by procedure through the county commissioners and other county officials, but it may be secured through action by either the town supervisors, or the judge of the district court, or the state drainage commission.[51]

Town drainage ditches may be established on petition filed with the town clerk and signed by one or more persons or corporations owning lands that will probably be benefited, or by the chief executive of any city or village with streets likely to be improved thereby, or by town supervisors in similar cases. In such petition the town supervisors may be requested to appoint an engineer and an attorney. The town clerk gives notice of the hearing on the petition in much the same way as the auditor in county ditch proceedings, and then there is a meeting of the town supervisors, who may appoint the engineer and attorney. The whole body of supervisors, or a

whether landowner who appears in the proceedings and objects to them can thereafter enjoin them. Dahlberg *v.* Lundgren, 118 *Minnesota,* 219 (1912).

[47] State *v.* Johnson, 111 *Minnesota,* 255 (1910). Jacobson *v.* Lac qui Parle County, 119 *Minnesota,* 14 (1912).

[48] *Revised Laws,* 1905, sec. 919. (*General Statutes,* 1913, sec. 2108.)

[49] State *v.* Johnson, 111 *Minnesota,* 255 (1910).

[50] State *v.* Tuck, 112 *Minnesota,* 493 (1910). (With respect to irregularities in general, and appeals, injunctions, etc., it should be noted that no one can take advantage of any error, in proceedings or defects or irregularities in records, unless he is directly affected thereby. *Laws,* 1905, ch. 230, sec. 50; amended by *Laws,* 1907, ch. 367, sec. 5.)

[51] What might perhaps be called another method of establishing ditches is provided for through the county board or district court in cases where the petitioners are willing to pay all the expenses themselves, so that no obligation whatever is placed upon either the county or upon landowners not joining in such petition. This procedure as might be expected is more simple than the others provided by statute. See *Laws,* 1905, ch. 230, secs. 55-62.

committee composed of three of their number, then performs substantially the same duties as the three viewers used in the case of county drains, and the board as a whole acts as the county board does, and orders the establishment of the ditch. The remainder of the proceedings are, in general, the same as those followed in the opening of county drains, as to the letting of contracts, the giving of bonds, the form of the contract, modifications in plans, recording of lien statement, rules to be followed in the assessment of damages and of benefits, and certificates of completion. In these proceedings the town clerk and supervisors perform substantially the same functions, respectively, as the county auditor and county commissioners in county drain proceedings. The chief points of difference between the township drainage law and that for county ditching are as follows: (1) as might be expected, because of its lesser functions, the town law is much less detailed, and more simple than the county statutes; (2) the use of the procedure for the improvement of highways, and the consequent assessment of public corporations for benefits thereto seem to be slightly more emphasized in the township laws; (3) in the case of town ditches no bonds are issued to provide immediately available funds, but the ditch petitioners are required to advance all costs and expenses of the proceeding from its inception to its completion, including damages awarded and the cost of constructing the drain. Such advances are repaid pro rata when the moneys come in from the paying-off of liens and assessments for benefits.[52]

The action of the district court is invoked whenever it is desired to extend a ditch into more than one county. In such proceedings the judge of the district court and the clerk of that court, respectively, perform all the duties and have all the powers of the county board and county auditor, and are governed by many of the same statutory provisions. Thus, the judge appoints the engineer and viewers and holds the hearing, while the clerk of court posts and publishes the notices and receives the petition. The procedure throughout is practically the same as that followed in the establishment of county ditches. The distinguishing characteristics of the judicial ditch system which should be noticed are the following: (1) in case any proposed ditch extends into any other judicial district, proceedings may be commenced before the judge of either district, and such judge has jurisdiction of all subsequent matters relating to that ditch; (2) in the matter of financial administration, the judge by his order at the time of the hearings, or at any other time upon five days' notice of the time and place of such hearing given to the auditor of each county interested or affected, apportions the items and portions of expense to be borne by the respective counties, each one of which may then issue its bonds as in the case of a public drain in one county alone.[53]

[52] *Laws*, 1909, ch. 127.

[53] *Laws*, 1905, ch. 230; amended by *Laws*, 1909, ch. 469, *Laws*, 1911, ch. 384, *Laws*, 1907, ch. 367, *Laws*, 1913, ch. 179, 568, and 578.

The state drainage commission consists of the governor, the state auditor, and the secretary of state. It has power to construct ditches, widen, deepen, and straighten natural water-courses for drainage purposes, and open new outlets to lakes, if such lakes are normally so shallow as to be incapable of any beneficial public use of a substantial character for fishing, boating, or public water supply.[54] It makes surveys of wet lands and water-courses, and cleans and repairs state ditches, but as a condition precedent to the exercise of these latter powers it must require that persons or corporations benefited thereby shall pay for such benefits. The commission may, when necessary in order to carry out its duties, acquire private property by purchase or the exercise of the power of eminent domain.[55] Before the commission constructs any public drain it files a petition with the judge of the district court of the county in which it is proposed to construct the ditch, setting forth its necessity and containing a description and map of the route contemplated, land affected, and estimates of cost. Within ten days the judge of the district court appoints two residents of the county or counties concerned, who, together with one non-resident appointed by the state commission, perform functions similar to those of the viewers in county and judicial ditch proceedings, and report in detail within thirty days from the date of their first meeting. This report is filed with the clerk of the district court. Any persons aggrieved by the allowance of damages may petition the court for the appointment of appraisers in the same manner as in cases of appropriations of private property for public use, provided such petition is filed within ten days after the report of the viewers. After the filing of the viewers' report, there is a hearing before the court, due public notice having been given. At such hearing the assessments of benefits and damages, determined in a manner similar to that used in county and judicial ditch proceedings, are confirmed if satisfactory, and the construction of the

[54] *Laws*, 1907, ch. 470, sec. 1, 2. By sec. 34, *Laws*, 1905, ch. 106, relating to a state drainage commission, was repealed. If the lake be meandered it can be drained or lowered only on petition of at least sixty per cent of the legal voters who are freeholders with lands affected, and who reside within four miles of the lake. *Laws*, 1907, ch. 470, sec. 2. With reference to meandered lakes it may be noted that the drainage act of 1887 did not authorize the drainage of public meandered lakes. Witty *v.* Nicollet County, *76 Minnesota*, 286 (1899). See also Dressen *v.* Nicollet County, *76 Minnesota* 290 (1899). As to sufficiency of evidence to sustain finding of county board as to the character of a lake, under proceedings to drain it by authority of *Laws*, 1905, ch. 230, see Madsen *v.* Larson, 117 *Minnesota*, 369 (1912). It has been held that a statute making it a criminal offense for any person to drain a meandered body of water is not applicable to limit the effect of a later statute authorizing the draining of wet and overflowed lands through legal proceedings therein prescribed. (The drainage statute related to county drains and was *Laws*, 1883, ch. 108.) Dowlan *v.* Sibley County, 36 *Minnesota*, 430 (1887).

[55] *Laws*, 1907, ch. 470; amended by *Laws*, 1909, ch. 207, sec. 1. Special powers were given to the state drainage commission by the three following acts: *Laws*, 1911, ch. 138, "An act to authorize the state drainage commission to construct an outlet for the waters of the Mustinka state ditch in Traverse County, etc." *Laws*, 1911, ch. 370, "An act to authorize the state drainage commission to coöperate in the construction of an additional outlet for the waters of the Snake River in Marshall County, etc." *Laws*, 1909, ch 336, sec. 1, relating to Big Stone Lake, and the Minnesota and Whetstone rivers.

drain is ordered by the court. Jury trials, appeals, and the filing of lien statements are provided for in the usual manner. The state commission, however, furnishes the plans and specifications and lets the contract to the lowest responsible bidder, a bond being required, and the contract approved by the attorney general of the state. The county boards, in the counties concerned, issue the bonds of their respective counties, for amounts apportioned to them in assessments; and the liens, which are relied upon as the source of the moneys to be used in retiring the county bonds, must be paid off in twenty years, the first installment being due in not more than five years. The proceeds from the sale of county bonds are transferred by the respective county treasurers to the state treasurer, who credits them to the state drainage fund. The commission may appropriate out of its funds money in aid of ditch work not done by itself, provided such appropriation does not exceed one half of the total cost of the work.[56] The state drainage commission is authorized and directed to make a topographical survey of the watersheds of the state; prepare maps, plans, and specifications for their drainage for the use of counties concerned; prescribe rules governing ditches constructed in the various counties of the state; and coöperate with the United States Department of Agriculture in the making of surveys.[57]

It will already have been noticed that there are at least three great principles underlying all drainage procedure in Minnesota, whether the public ditch be established under the authority of town supervisors, or county commissioners, or judges of the district court, or of the state drainage commis-

[56] *Laws*, 1907, ch. 470; amended by *Laws*, 1913, ch. 4.

[57] *Laws*, 1909, ch. 471. The legislature of Minnesota has enacted a great number of statutes designed to adapt the general drainage laws to particular conditions or various contingencies arising in their administration, to remedy defects or irregularities in prior proceedings, to modify the statutes in the light of court decisions or protect rights which might otherwise be left unprotected as a result of proceedings in particular cases being held invalid in such decisions, and in general to make the laws more practicable. Given below is a list of the more important of such laws now in force.

Laws, 1905, ch. 230, as amended by *Laws*, 1907, ch. 367, sec. 9, and *Laws*, 1911, ch. 113, relating to assessments anew by county boards in cases where assessments already made have been declared invalid by the courts of the state.

Laws, 1905, ch. 230, as amended by *Laws*, 1909, ch. 469, sec. 13, authorizing purchase of right-of-way in adjoining states when necessary.

Laws, 1907, ch. 136, providing for changes in method of construction.

Laws, 1911, ch. 54, authorizing the consolidation of proceedings.

Laws, 1911, ch. 278, providing for readjustment necessary as result of formation of new county.

Laws, 1913, ch. 208, permitting reduction in estimating benefits to the extent of the value of land taken by the ditch and its waste bank from owner of land charged with benefits.

Laws, 1913, ch. 379, sec. 1, permitting addition to cost of ditch of cost of culverts omitted from estimates in engineer's report.

The following statutes which are curative are now in force: *Laws*, 1905, ch. 157; *Laws*, 1905, ch. 180; *Laws*, 1905, ch. 247; *Laws*, 1907, ch. 9; *Laws*, 1907, ch. 72; *Laws*, 1907, ch. 371; *Laws*, 1907, ch. 246; *Laws*, 1907, ch. 75; *Laws*, 1907, ch. 363; *Laws*, 1909, ch. 83; *Laws*, 1909, ch. 422; *Laws*, 1909, ch. 257; *Laws*, 1909, ch. 10; *Laws*, 1905, ch. 230 as amended by *Laws*, 1909, ch. 469, sec. 13; *Laws*, 191, ch. 384, sec. 14, as amended by *Laws*, 1913, ch. 335, sec. 1; *Laws*, 1911, ch. 292; *Laws*, 1911, ch. 273, sec. 1; *Laws*, 1913, ch. 2; *Laws*, 1913, ch. 463.

It has been held that a judgment restraining a county board from collecting a tax for benefits under irregular drainage proceedings did not prevent the board from instituting fresh proceedings under *Laws*, 1893, ch. 152, a curative act. Curran *v.* Sibley County, 56 *Minnesota*, 432 (1894).

sion. (1) All proceedings are commenced by petition, which, except in the case of state ditches, must be made by interested landowners. (2) The cost of the work and the damages allowed those whose property is taken or injured are paid by the landowners themselves in proportion to the benefits received by each of them. (3) All persons concerned are fully protected by requiring due notice of all important steps in the procedure, public hearings with an opportunity to protest against the establishment of the ditch, its plan and route, or damages assessed and awarded, jury trials, and the remedies of certiorari, injunction, and appeal.

CHAPTER VII

SWAMP LAND RECLAMATION IN MINNESOTA

Minnesota in her natural state had an area of more than 10,000,000 acres of swamp land, most of which was located in the northern counties of the state. St. Louis County contained 1,392,160 acres; Beltrami, 1,451,520 acres; Koochiching, 1,000,000 acres; Lake, 798,600 acres; Itasca, 590,600 acres; Roseau, 533,680 acres; Aitkin, 529,880 acres; Cass, 316,240 acres; Pine, 293,000 acres; Marshall, 258,240 acres; Clay, 230,000 acres; and there were over 100,000 acres each in the counties of Kittson, Otter Tail, Polk, Crow Wing, and Cook.[1] Although not recorded in surveys there were large amounts of swamp land in the southern counties of the state as well as in the northern.

While Minnesota was still a territory, the federal government had already adopted the policy of granting to the new states, on their admission into the Union, the swamp lands located within their borders. Two of the territorial governors urged the legislature to see to it that steps be taken to secure for Minnesota the wet areas within their boundaries;[2] but Congress took no action during territorial days.[3] By an act of March 12, 1860, the federal government conveyed to the state in fee, the whole of the swamp and overflowed lands, made unfit thereby for cultivation" within the state, provided "that the proceeds of said lands, whether from sale or by direct appropriation, in kind, shall be applied exclusively, as far as necessary, to the purpose of reclaiming said lands by means of the levees and drains aforesaid."[4] The commissioner of the general land office advised Governor Ramsey that he himself could decide whether to accept the plats and surveys of the federal government, or to order a resurvey under the direction of the state, and that he need not refer that question to the legislature.[5] But the governor did refer the matter to the legislature and asked them to decide

[1] Drainage Commission, *Report*, August, 1910, pp. 66, 67. (See Appendix 5, chart A.)

[2] Governor Gorman in his message of 1856, p. 9; Governor Medary, in his message of December 11, 1857, p. 34.

[3] In the session of 1855 of the territorial legislature a member gave notice of intent to memorialize Congress on the subject, but I find no such memorial.

[4] An act of September 28, 1850, entitled, "An act to enable the state of Arkansas to construct the necessary levees and drains to reclaim the swamp and overflowed land therein," by the act of March 12, 1860, was extended to Minnesota and Oregon. See also Minnesota, *Executive Documents*. 1860, at p. 5 of Governor Ramsey's special message.

[5] Letter of August, 8, 1860, to Governor Ramsey. Minnesota, *Executive Documents*, 1860.

the matter.[6] An act was passed establishing the bureau of public lands, composed of the governor, attorney general, and the superintendent of public instruction, and that body was to have charge of the swamp lands as well as other lands, and to cause a survey to be made of the wet lands embraced in the grant by Congress, such survey to be confined to twelve townships.[7] The object of this experimental survey was to test the correctness of the plats of the federal government, but the provisions of the statute were impracticable, and the survey was not completed. Largely for the purpose of avoiding the expenses that would be involved in a resurvey of the state, the bureau of public lands recommended the acceptance of the survey made by the general government,[8] which recommendation was carried out by the legislature. It then remained for the general land office to see to it that deeds covering the lands granted should be turned over to the state as fast as complete surveys in detail of such lands could be made. The grant of swamp lands thus having been duly accepted by the state, the question then arose as to the disposition of those lands, and the use that should be made of the funds derived from their sale if they should be sold.

It will be remembered that the grant of overflowed areas to the state contained a provision that the proceeds from the sale of such lands, or the lands themselves in case of direct appropriation, should be applied "exclusively, as far as necessary," to the drainage of these lands. It may be that this phrase, "as far as necessary" was construed to have the practical effect of sweeping away any conditions attached to the grant, and that for that reason the use of these lands for other than drainage purposes was urged from the time of the acceptance of the grant, but the fact seems to be that the condition of the conveyance to the state was simply ignored or forgotten for a great many years. For, from the very first, the leading public men of Minnesota advocated the use of these swamp lands for many purposes other than drainage. This was probably natural, because, as we have suggested, men in those early times were interested primarily in other things than drainage, and much better lands were still cheap and readily available for agricultural purposes. It will be remembered that the movement for state aid to drainage did not gain much headway until the Crookston convention of 1886.

The first objects to the support of which it was seriously urged that the state swamp lands should be devoted, were state institutions. Said Governor Ramsey, in his message to the legislature in 1861: "Upon the proceeds of the swamp lands we will have mainly to depend for the means of building up those great humane institutions, asylums for the blind, deaf and

[6] Governor Ramsey, in his message of January 26, 1861. *Executive Documents*, 1860, p. 5 of message.

[7] *Laws*, 1861, ch. 13.

[8] Governor Ramsey in his message of January 9, 1862, p. 14.

dumb, and insane, which are at once the glory and necessity of our modern civilization." He also suggested that some of such funds might be devoted to the erection of a new state prison, or to the endowment of normal schools, or distributed to the counties as a road fund.[9]

Notwithstanding this recommendation that state institutions be endowed by the moneys derived from the sale of the state's swamp lands, the legislature did nothing in that direction. But because of the great demand at that time for transportation facilities, the first of a series of acts was passed granting swamp lands in aid of railroad companies. An act of 1861 granted to the Lake Superior and Mississippi Railroad Company seven full sections of swamp lands for each mile of railroad constructed from St. Paul to Duluth.[10] In all, this grant included 694,000 acres of land.[11] Another act of the same year conveyed to the Taylors Falls and Lake Superior Railroad Company seven sections of the state's wet lands for every mile of line built from Taylors Falls to Wyoming, Minnesota.[12] Besides these two acts using the swamp lands for railroad purposes, all the state's wet lands situated in McLeod County were conveyed to the county commissioners in trust to be used in aid of the construction and maintenance of an agricultural college in that county.[13] At a later time, upon the location of the agricultural college elsewhere, it was enacted that these lands should be used for the endowment of Steven's Seminary.[14] About 4,683 acres accrued under this statute.[15] An act of 1862 provided for the construction of a state road from Madelia to a point on the western boundary of the state, named three persons as a commission to see to the carrying-on of the work, and appropriated 10,000 acres of swamp lands to furnish the necessary funds. The road was to extend towards Sioux Falls, South Dakota.[16] Later it was charged that this last grant was "very loosely guarded, and the gist of the whole scheme was to obtain valuable lands for a small consideration"; the patenting of the lands was delayed for a time; and the land finally conveyed amounted to but 4,683 acres.[17]

At the opening of the legislative session in 1863, Governor Ramsey again referred to the need of adopting a wise and far-seeing policy in regard to the disposition of the wet lands owned by the state. Because of the timeliness of the warning and of the fact that it incidentally throws some light

[9] Governor Ramsey in his message of January 9, 1861.

[10] *Laws*, 1861. Act of March 8.

[11] Auditor's Report of 1909-10, p. 22.

[12] *Laws*, 1861. Act of March 8.

[13] *Laws*, 1861, Act of March 12, ch. 65.

[14] *Special Laws*, 1868, ch. 114, p. 404. *General Laws*, 1865, ch. 7.

[15] Auditor's Report of 1909-10, p. 23. Other acts regarding McLeod affair are: *Special Laws*, 1870, ch. 92; *Special Laws*, 1879, ch. 70.

[16] *Special Laws*, 1862, ch. 56.

[17] *Special Laws*, 1866, ch. 111. Gov. Marshall in his message of Jan. 10, 1867, p. 16. Auditor's report for year ending Nov. 1866. *General Laws*, 1869, ch. 96, p. 118. Auditor's Report, 1872. *Executive Documents*, 1872, Vol. 1, p. 379; *Executive Documents*, 1873, Vol. 1, p. 507. Statistics.

on the expectations possessed by the Governor as to the value of these lands in the future it may be well to quote at some length from this message by Governor Ramsey. He wrote: "I can not but trust that the people and their representatives will continue to have an increasing appreciation of the value of these lands, and will steadily resist every application that may arise for their appropriation, unless for the most assured public necessity and benefit. Unless some new policy of this kind is inaugurated, these swamp lands, which I confidently anticipate will in a few years furnish us with a large reserve fund of millions of dollars to discharge whatever indebtedness the necessities or the follies of the state, in its earlier history, may have imposed upon us, as also for the erection and maintenance of those great eleemosynary institutions, which, before many years the state will be called upon to erect, at a cost of several hundred thousand dollars each, such as asylums for the insane, deaf, dumb, and blind, will have been wasted; and nothing but taxation, the great hindrance to immigration, will be left to us a resource for such purposes."

In spite of this vigorous message from Governor Ramsey the legislature of 1863 did nothing towards devoting the state swamp lands to the support of state institutions, but, on the contrary, passed an act granting to the St. Paul and Chicago Railroad Company, a predecessor of the Chicago, Milwaukee and St. Paul Railway Company, seven full sections of swamp lands for each mile of railroad constructed between St. Paul and Winona, a distance of about one hundred and three miles, such lands to be deeded to the company as each twenty-mile section of the line was completed.[18] This act, if the railroad complied with the conditions of the grant, would result in about 462,336 acres of swamp land passing out of the control of the state.[19]

Governor Miller, in his inaugural message of 1864, reaffirmed the position taken by Governor Ramsey, and gave a similar warning to the legislature against squandering the swamp lands or the proceeds from their sale. He said: "We are evidently drifting upon that alternative which shall secure the early appropriation of these lands," to the support of state institutions, or of "kindred objects or result in their inequitable distribution to corporations important to our prosperity, but secondary to the great interests involved. Along the track of legislation in the neighboring states, we everywhere discover the wreck of similar gratuities; and if, with these warnings, we pursue an equally reckless course, we shall deserve the condemnation both of our contemporaries and of the generations that will succeed us."[20]

[18] *Special Laws*, 1863, ch. 5, p. 149.

[19] About 425,300 acres were actually charged to the company, it having complied substantially with the terms of the grant. Auditor's Report of 1909-10, p. 23. For subsequent acts relating to this grant see: *Special Laws*, 1865, ch. 6. Also Gov. Swift's Message of Jan. 11, 1864, p. 6; Gov. Marshall's Message of Jan. 10, 1867, p. 16; Auditor's Report of 1873; and *Executive Documents*, 1877, Vol. 1, pp. 397 and 405.

Again in 1865 he urged the legislature to dedicate several hundred thousand acres of swamp land to the support of state institutions,[21] and this time his efforts and those of Governor Ramsey were successful. By an act of February 13, 1865 it was provided that as soon as the title to enough swamp lands was patented to the state by the federal government, the commissioners of the state land office should select and set apart for the erection and support of the following institutions the following amounts of swamp lands, the lands so selected to be irrevocably dedicated to those purposes: an insane asylum, 100,000 acres; deaf and dumb at Faribault, 100,000 acres; each normal school then or thereafter established, not exceeding three, 75,000 acres; state prison, 100,000 acres.[22] Another act passed later in the same session appropriated the remainder of any wet lands in the state to the erection and support of an orphan asylum for children of Minnesota officers and soldiers killed in the war.[23]

Though action regarding state institutions was thus secured in the session of 1865, the legislature had already passed two acts in further aid of railroads. One act granted to the Minneapolis and St. Cloud Railroad Company, now succeeded by the Great Northern, ten sections of swamp lands for every mile of line built from St. Cloud to Hinckley.[24] This amounted to 425,664 acres.[25] The second act granted to the same company four sections of similar lands per mile of railroad constructed from St. Cloud to any southern Minnesota railroad running from east to west, or to connect with the Winona and St. Peter Railroad Company's line.[26] Though the conditions of the former acts were complied with, those of the latter were not and that grant was subsequently declared forfeited to the state.[27]

And even after the act relating to aid for state institutions had been passed, the legislature went on to make further grants in aid of railroads, and of other private undertakings. A statute of February 16 appropriated four sections per mile to the Southern Minnesota Railroad, from Fillmore County to the western boundary of the state.[28] An act of March 2 gave to the Minnesota Central Railroad Company 275,000 acres for a line from Red Wing to Mankato by way of the Cannon River.[29] To aid the Cannon River

[20] Governor Miller in his message of Jan. 13, 1864.

[21] Governor Miller in his message of Jan. 4, 1865.

[22] *Laws*, 1865, ch. 5, February 13, 1865; for subsequent acts relating to this appropriation, see *Laws*, 1875, ch. 95; *Laws*, 1907, ch. 385.

[23] There does not appear to have been any action taken under this last act, and the auditor's report of 1909-10 records no selections as having been made under the act, which was ch. 3, of *Laws*, 1865, March 3.

[24] *Laws*, 1865. Act of February 11, 1865.

[25] *Auditor's Report*, of 1909-10, p. 23.

[26] *Special Laws*, 1865, ch. 3, p. 24.

[27] *Laws*, 1895, ch. 66. Other acts relating to this grant are: *Special Laws*, 1869, ch. 56, p. 249; *Special Laws*, 1881, ch. 65, p. 112; *Laws*, 1887, ch. 19, p. 76.

[28] *Special Laws*, 1865, ch. 1.

[29] Amended by *Special Laws*, 1873, ch. 110.

Improvement Company in the construction of slack-water navigation on the Cannon River it was given all swamp lands in the odd-numbered sections in the St. Peter land district, not to exceed 300,000 acres, and at the rate of four sections for each mile of navigation completed. Later these rights were transferred to others, for railroad and manufacturing purposes.[80]

In 1870 Governor Austin suggested that after the grants already made were satisfied, the swamp lands might be disposed of in the same manner as school lands, and the proceeds be devoted to the purchase of libraries for the public schools.[81] Nothing resulted from his proposition as to the use of the proceeds, but his suggestion as to the manner of sale may be noticed because it is an early forerunner of the constitutional amendment of 1881, and the present method of selling the state's swamp lands. Five years after this statement by Governor Austin a statute relating to the disposal of the state institutions' swamp lands provided that they should be "appraised and sold in the same manner and by the same officers, and the minimum price [should] shall be the same as provided by law for school lands under title one of chapter thirty-eight of the general statutes" with certain modifications. The principal of such funds should remain inviolate and invested in United States bonds or those of the state, and the interest annually apportioned to the support of the different institutions entitled to receive the same.[82] Six years after this method of sale had been applied to those swamp lands that were set apart for certain institutions, it was extended to all swamp lands owned by the state as a result of the following constitutional amendment: "All swamp lands now held by the state, or that may hereafter accrue to the state, shall be appraised and sold in the same manner and by the same officers, and the minimum price shall be the same less one third, as is provided by law for the appraisement and sale of the school lands under the provisions of title one of chapter thirty-eight of the general statutes. The principal of all funds derived from sales of swamp lands as aforesaid, shall be preserved inviolate and undiminished. One half of the proceeds of said principal shall be apportioned to the common school fund of the state; the remaining one half shall be appropriated to the educational and charitable institutions of the state, in the relative ratio of cost to support said institutions."[83] The statute referred to provides for public sale, and a minimum price of five dollars an acre. The similarity between the amendment and the law of 1875 is manifest. Thus it was that Governor Austin's suggestion as to the manner of sale, made eleven years before, and Governor Ramsey's, as to the use of the proceeds for the support of state

[80] *Special Laws*, 1865, ch. 76, p. 225; 1870, ch. 118, p. 438; 1873, ch. 110, p. 300; 1875, ch. 58, p. 290; 1877, ch. 244, p. 309; 1883, ch. 19, p. 196; 1885, ch. 101, p. 271.

[81] Governor Austin in his message of January 7, 1870, p. 17.

[82] *Laws*, 1875, ch. 95, p. 125.

[83] Proposed by *Laws*, 1881, ch. 48, March 3, 1881. Adopted November 8, 1881.

institutions, made twenty years before, were incorporated into the constitution of the state, after about 2,883,594 acres of swamp land had been granted in aid of private enterprises, chiefly railroads.

Here the suggestions leading up to the constitutional amendment of 1881 have been indicated. It will be necessary, however, to turn back for a moment and briefly mention two swamp land grants which went into effect before the adoption of the amendment. An act of 1875 granted to the Duluth and Iron Range Railroad Company ten sections for each mile of line built from Duluth to a certain township on the Mesabi Range, to be deeded in ten-mile tracts.[34] And an act of March 3, 1881 provided for the deeding of six sections per mile to the Sioux Falls and Dakota Railroad Company, a predecessor of the Northern Pacific, for a road from Little Falls to the western boundary of the state. This grant, if the required conditions were complied with by the railroad, would consist of 265,856 acres of swamp land.[35]

Thus, we have seen that by the adoption of the constitutional amendment in 1881 further appropriations of the state's swamp lands to the purpose of aiding in the construction of railroads were forbidden. The wet lands of the state were used to help railroads, state institutions, a slack-water navigation company, and a seminary, and now they were to be also used to add to the common school fund of the state. From the time of the acceptance by the legislature of the lands granted by Congress in 1860 no attention seems to have been given to the clause in the act by which the grant was made: "Provided, that the proceeds of said lands . . . shall be applied exclusively, as far as necessary, to the purpose of reclaiming said lands." The first public reference to this condition in the grant, which I have thus far been able to find, does not occur until nearly thirty years after the grant was made by Congress. In 1887 Governor Hubbard urged that the legislature take some action in aid of drainage, having been requested to do so by the Crookston drainage convention, which had met in 1886. Desiring to help the drainage movement, which had just begun to be strongly felt, he found that the constitution of the state stood in the way of direct appropriations to aid such ditches as were proposed in the Red River Valley, and then it was that he called people's attention to the condition in the grant of 1860, and pointed out that, if it had been considered, there might then have been available a large fund for the purpose of

[34] *Special Laws*, 1875, ch. 54. Other statutes regarding the same grant are: *Special Laws*, 1885, ch. 87; *Special Laws*, 1885, ch. 300; *Laws*, 1897, ch. 168.

[35] *Auditor's Report*, 1909-10. The state disputed the claims of the Northern Pacific, on the ground that 2.3 miles had not been completed at the western end of the last section of thirty miles of line built by it. The governor was authorized to compromise in 1901 by offering 35,456 acres, but no settlement was reached, and the state now denies the claims of the company. See *Laws*, 1901, ch. 193, p. 267.

drainage.[36] In 1895 Governor Nelson said: "The state, having accepted the lands, stands morally, if not technically, charged with the trust, and in expending money for this work of drainage, is doing no more than what it fairly undertook to do when it accepted the grant."[37] In the succeeding paragraphs of this chapter we shall see what the state has done to carry out the trust and to reclaim the swamp lands within her borders.

It has already been pointed out that there were originally in Minnesota over 10,000,000 acres of swamp lands, most of which was located in the northern counties of the state.[38] Fully ninety-five per cent of this entire area could be easily and cheaply drained, and about sixty per cent of it was either open marsh, meadow, or swamp sparsely timbered. The surface slopes were favorable to drainage works, since in some of the northern swamps there is a slope of as much as ten feet to the mile, and a declination of three and four feet to the mile is quite common.[39] The state does not have to face the problem of shutting out sea waters from low tidewater lands, nor is it necessary to build great levees along its watercourses. Drainage can be accomplished by digging the shortest possible canals to the nearest watercourses.

Although a drainage survey of the counties of the Red River Valley in 1886 had shown that outlets for the drainage of swamp lands in that region were not only feasible, but could be constructed at a cost which was very low compared to that in other parts of Minnesota or in many other states, very little work was done prior to 1895. In 1887 the first important drainage law was enacted, and the legislatures of 1893 and 1897 made appropriations amounting in all to $162,500; but these appropriations were small compared with the magnitude of the work to be done and to subsequent expenditures by the state, and it may be said that real progress in swamp land reclamation in Minnesota began about 1900.[40]

Because of the relatively greater importance to them of the swamp land problem, it would be expected that those counties that would accomplish the greatest amount of reclamation work in the state would be those of the Red River Valley and the northern part of the state; and such has been the case. Under the county and judicial laws Marshall County has drained 1,349,064 acres; Polk, 997,341 acres; Beltrami, 370,039 acres; Pennington, 284,945 acres; Clay, 284,717 acres; Kittson, 268,618 acres; Red Lake, 241,568 acres; Aitkin, 226,141 acres; Wilkin, 198,183 acres; Roseau, 168,470 acres; Norman, 164,463 acres; Koochiching, 127,749 acres; Redwood, 127,254 acres. The northern counties lead in the number of miles of ditches

[36] Governor Hubbard in his message of January 5, 1887 in *Executive Documents*, 1886-87, vol. 1:29.

[37] Governor Nelson in his message of January 9, 1895 in *Executive Documents*, 1894, vol. 1:27.

[38] Minnesota State Drainage Commission, *Report*, 1913, 16, 139.

[39] *Ibid.*, 16.

[40] G. A. Ralph in *St. Paul Pioneer Press*, January 21, 1912.

constructed by them as well as in the total cost of their work. Marshall County has built 920 miles of drain at a total cost of $1,496,702; Beltrami, 463 miles for $685,235; Pennington, 237 miles for $330,020; Clay, 186 miles for $328,224; Kittson, 159 miles for $296,290; Red Lake, 172 miles for $276,731; Aitkin, 280 miles for $470,620; Wilkin, 196 miles for $265,690; Roseau, 147 miles for $221,344; Norman, 134 miles for $172,053; Koochiching, 85 miles for $139,757; Redwood, 354 miles for $417,000.

The total number of acres of land drained or benefited by judicial and county ditches is 5,846,126. This work has involved the construction of 8,941 miles of public drains, and the excavation of nearly 80,000,000 cubic yards of earth, and cost $12,131,075. But the estimated benefits from the work are $20,844,223. The average price per yard paid contractors has varied from eight cents in Steele and Waseca counties and nine in Dodge and Faribault, to twenty-five in Koochiching, and twenty-two in Itasca;[41] and the average cost per acre of land benefited has run from $0.64, $0.81, $1.10 and $1.10 in Traverse, Polk, Norman, and Marshall counties, respectively, to $14.00, $14.80, and $16.00 in Jackson, Brown, and Lincoln counties.[42] In all county and judicial ditch work the average price per yard paid contractors has been 15.7 cents, and the average cost per acre for lands benefited, $2.07.

State ditches have been constructed under the authority of the Red River Valley Drainage Commission, and the present state drainage commission. During the years from 1893 to 1899 the Red River Valley Commission built nineteen state ditches at a total cost of $162,412, these drains being located in Grant, Traverse, Wilkin, Clay, Norman, Polk, Kittson, and Marshall counties.

The present commission, beginning its work in 1901, has built seventy-six more state ditches, and aided in the construction of nine coöperative drains. Over 1,157 miles of state and coöperative ditches have been completed, and over 16,000,000 cubic yards of earth excavated at a cost of $1,566,249. But this work has drained 336,641 acres of swamp lands, and benefits have been assessed against landowners amounting to $3,830,848. The work done since 1907 drains 292,037 acres of state lands and 681,105 acres of private lands.

The legislature of 1907 appropriated $200,000 for the use of the state commission, the legislature of 1909 an additional $200,000, and that of 1911 appropriated $50,000 for topographic and water resources surveys, $35,000 for the construction of an outlet for the Mustinka state ditch, $12,000 for assessments against state lands drained, and $5,000 to be used in coöperation with Marshall County in the construction of an additional

[41] See Appendix 5, Chart C.
[42] See Appendix 5, Chart D.

outlet for Snake River. The total sum appropriated for the use of the present commission since its creation is $502,000.[43] This fund, however, has been augmented by moneys paid in from time to time for assessments against private lands, by counties in which the state ditches have been located. The amount received from this source and credited to the drainage fund is $686,350. Thus, the commission has had at its disposal in the last six years $1,188,350. This fund has been appropriated as follows:

For drainage of state lands.....	$1,009,636
Coöperative ditches and surveys.....	63,540
Topographic surveys	39,629
Water resources surveys and investigations.	35,544
Outlet for Mustinka state ditch.....	35,000
Improvement for Snake River.....	5,000

On June 21, 1909 a coöperative agreement was entered into between the state drainage commission and the United States Geological Survey, under which a topographical survey supervised by state and federal engineers was made of a large area of land in Otter Tail, Douglas, Grant, Traverse, Stevens, Pope, Swift, and Crow Wing counties, and a report of the work published.

In May of 1909 a coöperative agreement was entered into between the Water Resources Branch of the United States Geological Survey, and the state commission, under the terms of which surveys and investigations of the water resources of the state were to be made, as directed by a resolution of the 1909 legislature.[44] The cost of the work was to be equally divided between the state and federal authorities. The results of these investigations were embodied in a special report. At the present time surveys have been made of all or parts of the following strems; and plans, estimates, and specifications for their improvement, so as to prevent disastrous overflows, have been prepared and furnished to the counties affected thereby. These rivers are the Minnesota, Mustinka, Watonwan, Embarrass, Cedar, Redwood, Stony Brook, Chippewa, Long Prairie and Wild Rice. A channel has also been surveyed through several lakes in Martin County, and a complete survey made of Mille Lacs Lake.

The work done by the state commission in the preparation of plans and the making of surveys indicates a growing realization on the part of the public authorities that the drainage problem is one that can be effectively

[43] The attorney general of the state in an opinion dated July 27, 1909, held that the appropriations of $25,000 to aid in the improvement of watercourses and drains, other than those benefiting state lands, and of $25,000 for the Whetstone River canal, were unconstitutional. On this point see also Constitution, art. 9, sec. 5.

[44] Joint Resolution Number 19.

solved, not with reference to arbitrary governmental divisions such as the county, but with regard to the topography of the land to be drained.

The state commission estimates that the cost of excavation has averaged about ninety per cent of the total expenditures for state ditches; culverts, bridges, road grades, and rights-of-way, three and one-half per cent; engineering and administrative expenses (including surveys, maps, plans, estimates, record books, office supplies, instruments, court costs, officers' fees, superintendence and inspection of work) six and one-half per cent. In the construction of nearly fifty state ditches under the assessment plan, where all expenses were charged against benefited lands, and many thousands of landowners assessed, there were no complaints of unjust taxation made to the commission. There was but one appeal from the court orders establishing the drains, and that was settled out of court. This fact, the low percentage of administrative costs and engineering costs, would indicate that the state drainage law is giving satisfaction, and is well adapted to accomplish the purposes for which it was enacted.

The policy of the state drainage commission has been to drain only such lands as would immediately become available for cultivation, because requiring little clearing or similar work before being fit for agricultural uses. Its work has, to a large extent, been confined to lands near to railroads and trade centers; it has avoided, so far as possible, the drainage of lands where the life of growing timber might be endangered by the removal of water from the soil.

In the construction of every ditch, public highways have been built along its sides from the excavated earth wherever such road construction was practicable. When drainage work now under way shall have been completed, there will be 575 miles of graded road along the several state ditches, constructed at but a small cost in addition to that of the ditches themselves. The average cost is not more than half a cent per cubic yard, or seventy-five dollars a mile of road.

Public drainage works already constructed under the county, judicial, and state-commission statutes have reclaimed approximately 7,179,767 of the 10,000,000 acres of swamp lands in Minnesota originally too wet for cultivation. This work has been done at a cost of $13,697,324, or about two dollars an acre. Although the assessed benefits amount to $24,675,071, and show a return of about two dollars for every dollar invested, yet the actual direct benefit to landowners has been estimated at from five dollars to eight dollars for every dollar expended in drainage. And of course the indirect benefits to the state caused by the increase in the value of the yearly crops of the state, betterment of public highways, and the promotion of health, are very great.

Perhaps a few concrete examples will serve to indicate the profitableness of public land drainage in Minnesota. At Island a four-thousand-acre farm

was reclaimed from the Floodwood swamp at a cost of two dollars an acre for drainage, and of from three to ten dollars for the clearing of timber, which was sold and considerably decreased the expense of reclamation. To-day the land is worth, exclusive of farm buildings, at least sixty dollars an acre. Land in the Gun Lake swamp in Aitkin County prior to the construction of state ditch number sixty-six was offered for sale at prices ranging from three and a half to five dollars an acre; but as soon as the construction of the ditch was begun, all state land sold as fast as it was placed on the market, and the price of farm land in that vicinity is now from sixteen to twenty-five dollars an acre. In 1912 the state auditor was selling reclaimed swamp land located at about seven miles from the county seat of Roseau County for as much as fifteen and thirty dollars an acre; formerly it was almost without any value whatever. And it is estimated that an investment of $30,600, in the drainage of 18,000 acres of state land by state ditch number sixty-nine will return to the state treasury approximately $450,000. For the cost of reclamation will be about one dollar and seventy cents an acre, and the land reclaimed will be sold at not less than twenty-five dollars an acre.

Because of the non-availability and incompleteness of the drainage records of the counties of Minnesota, it has been impossible to secure much information throwing light upon the question of the comparative efficiency of the state and county systems of reclamation. While the writer is of the opinion that any comparison would certainly not be to the disadvantage of the state drainage commission, and believes that it has done and is doing very efficient work and that its reports and figures are correct, the reader in drawing his own conclusions from the following figures should note that they are derived from the commission's own report. There have been some critics of that authority, but it is difficult to determine how much their adverse comments have been due to an unselfish interest in the welfare of the state, and how much to fear that the county system of land drainage may, as a result of comparison with state work, be shown to be less efficient than it ought to be. And in connection with the comparative cost of excavation work under the different authorities, it should be noted that the state commission may often secure better terms from contractors than the counties, since the contracts of the former are frequently much larger than those of the latter.

Average price paid contractors for one cubic yard of excavation:

In state and coöperative ditches	9.7 cents
In county and judicial ditches	15.7 cents

Average *cost* per acre of land benefited:

In state and coöperative ditches	$1.17
In county and judicial ditches	2.07

Average estimated *benefit* per acre of land benefited:	
In state and coöperative ditches	$2.87
In county and judicial ditches	3.56
Net profit per acre of land benefited:	
In state and coöperative ditches	$1.70
In county and judicial ditches	1.49[45]

[45] Except where special references are given in the footnotes, this chapter is based upon the 1910 and 1913 Reports of the Minnesota State Drainage Commission.

CHAPTER VIII

CONCLUSIONS

From the foregoing discussion of the progress that has been made in public swamp reclamation abroad and in the several states of the American Union, it is apparent that the United States has accomplished a considerable amount of drainage work during the comparatively few years which it has devoted to the problem of land drainage; and its experience, as well as that of other countries, conclusively demonstrates the practicability, wisdom, and profitableness of such undertakings. But it is also clear that there is still an enormous amount of land in this country which, in its present state, is too wet for cultivation; and that to render it suitable for tillage will necessitate the solution of many difficult engineering and administrative problems, and the expenditure of millions of dollars. Because of the almost total absence of available public records of the cost and expenditure of work done, and the general lack of interest in the subject, it has been difficult and indeed almost impossible to secure reliable or anywhere near complete information or statistics from which to make deductions as to the comparative efficiency of the different public agencies that have been employed in drainage work; yet some conclusions of interest or value may be drawn from the foregoing discussion.

In attempting to rank the American states with reference to the progress which they have made and are now making in land drainage, Ohio, Indiana, Iowa, and Illinois must be credited with having done the greatest amount of work in proportion to their original swamp-land areas. But while their laws as a whole are satisfactory, and they must be given the credit of doing pioneer work in wet-land reclamation, yet the absence of state-wide authorities has led to unnecessary expenditure which might have been avoided, especially in Illinois. At the present time, Michigan, Minnesota, and Missouri are probably doing the greatest amount of effective work; while Florida, Louisiana, and other southeastern states, containing more swamp lands than any others in the Union, have practically given away a large portion of their state lands and have only just begun to make them dry enough for cultivation. That Minnesota is taking a leading part in public land drainage in the United States is apparent from a consideration of the simplicity and practicability of its laws, the work of its state commission, its care in retaining the ownership of swamp lands, and the rapidity, excellence, and low cost of the work done by the state up to the present time.

If this study has revealed any general principle it is this, that to attempt to solve the problem of wet-land reclamation by agencies strictly confined to artificial territorial divisions, such as the county, or in larger problems, the state, is not only illogical but economically foolish. Statutory provisions for the coöperation of two or more counties in the same or in different states show that the truth has come to be recognized that successful drainage can not be accomplished without a consideration of the whole basin or watershed involved. The necessities are not essentially different from those of the sewerage system of a great city. No sensible person would think of building the upper end of the system without regard to the lower end, or of dividing the problem up into districts to conform to ward or precinct lines, and the construction of sewers in each district without regard to any other district, the sole object of each being to drain off its sewage on to some other land, without any consideration of possible effects upon surrounding territory. In planning the sewerage system of a municipality, if we are to be successful, we must at the very outset design each portion from outlet to the highest point, so that when the whole work is completed it will be a single unit composed of different parts working harmoniously together. And likewise in the drainage of swamp lands, whether the area to be reclaimed include ten acres or a million, it must, if included in a single river basin, eventually be drained as a unit. In England, individual holdings and districts were improved independently of each other, as though they had no common interests. As a continually larger part of the land was improved, the work of the several projects came in conflict more and more, and the work of earlier districts was made useless by later improvements. It has been estimated that as a result of this lack of regard for drainage basins as a whole, more than the present value of much of the fen lands of England has been spent in reclamation work, and the conditions, in some instances are still unsatisfactory. On the contrary, in Holland the very stupendousness of the problem was indirectly and to a certain extent an advantage to the people from a financial standpoint. For it was impossible for individuals to undertake the task of walling-out the waters of the sea, and, as a consequence, the interests of all the people and the topography of all the territory affected were considered in the solution of the problem; to that is to be attributed, to a considerable extent, the success of the Dutch. The fact that a given ditch for the time being gives some relief to a locality is no indication that it is properly laid out and constructed; it may become useless by the construction of another ditch above it, or, being badly planned, may increase the cost of drainage below. It is the realization of this truth that has been one of the causes leading to the creation of state drainage commissions in a few states other than Minnesota, that in this state led to the enactment in turn of laws relating to drainage by the successively larger agencies of township, county, and state, and, together with an increased ap-

preciation of the importance of wet-land reclamation in the United States has led to agitation for the participation of the federal government in the work of land drainage.

Up to the present time the national government has done nothing further in aid of swamp land reclamation than to make grants of land to the states; and, in view of the successful activity of persons interested in the irrigation of arid lands in the west in that direction, there has been surprisingly little agitation on the question of federal participation in drainage work. Congress has been memorialized on the subject,[1] and there have been several bills introduced therein relating to the drainage of overflowed lands through federal aid. In 1906 and 1908 Senator Flint, of California, tried to secure the passage of drainage acts similar to the irrigation laws of the United States, providing for the coöperation of states, corporations, or individuals with the secretary of the interior, and the creation of a fund to be loaned in assistance to public ditch projects.[2] A somewhat similar bill was introduced into the Senate in 1912 by John Sharp Williams; but none of these became laws.[3]

There has been some argument against federal participation in drainage work on the ground that the whole machinery with reference to the issuance of the necessary bonds and the collection and payment of interest and principal thereof should be state legislation resting upon the taxing power of the state, or upon the power of assessment for local improvement; that the national government has neither of these sovereign powers within the states; and that national irrigation statutes are to be distinguished from any that might be enacted relating to drainage in that in irrigation work the powers of the federal government have been exercised as a proprietor of arid lands, and not as sovereign, while in drainage work it would be unable to act in a proprietary capacity since it owns very little swamp land to-day.[4]

It is not necessary at this time to enter into a discussion as to the constitutionality of a federal law relating to drainage that would be similar in its provisions to national irrigation statutes the validity of which has been affirmed by the courts. Suffice it to say that there is eminent authority to the effect that such an act of Congress would be constitutional. And without reference to the question of constitutional law involved in the matter, it is certain that there are a great many arguments in favor of a participation by the national government in the work of land drainage thorough public action.

Practically all the reasons which have been advanced in favor of federal aid in irrigation work may also be given in support of similar aid to drainage

[1] 60-62 *Congressional Record*, 43: 1659. Oklahoma.

[2] 60-61 *Congressional Record*, 42 *Senate Report*, 289; *Scientific American*, 97:390.

[3] A. Ruhl in *Collier's*, 49:22.

[4] E. T. Perkins, Acting President of Second Annual National Drainage Congress in address at New Orleans, April 10-13, 1912.

projects. Not only is this work of reclamation of great importance to the health and prosperity of the United States as a whole, and immense sums of money beyond the ability of states or individuals to furnish needed to carry on operations until returns commence to come in from the sale of reclaimed lands, but the drainage problem offers better opportunities from a practical economic standpoint than does that of irrigation. The average cost of irrigation is thirty dollars an acre; that of drainage is about five or six dollars.[5] Swamp areas are more generally in the midst of more populous territory with already developed transportation facilities, the engineering problems as a rule are more simple, and the land is usually richer in itself than arid land. Then, too, the federal government is already well prepared to undertake such activities, for the United States Geological Survey, as the result of hydrographic and topographical surveys covering nearly a million square miles,[6] for several years has been gradually accumulating a great mass of maps, charts, statistics, and general information relating to rainfall, drainage, and watersheds.

But the principal argument in favor of a participation in drainage work by the national government is based upon necessity. The folly of attempting to solve this problem by means of agencies working independently of one another behind artificial governmental barriers has already been indicated, and has been given as one of the reasons for the development of state drainage commissions. It is also a reason for the control of drainage work by the federal government whenever very large areas are to be reclaimed. Without needlessly depriving any state of its prerogatives or sovereignty, or in the least undermining the principles of local self-government, and disregarding the fact that drainage work is often inextricably bound up with the problem of interstate waterways and irrigation, this important fact should be considered carefully, and given all the weight that it deserves: there are a considerable number of large swamps that lie in river basins extending through more than one state, and they can not be drained effectively or economically, or with justice to the inhabitants of each state, without the intervention of some interstate authority. The Dismal Swamp occupies parts of Virginia and North Carolina. The Savannah River on the northern border of Georgia, and the Appalachicola on its southwestern border have great swamp and overflowed areas in South Carolina, Alabama, and Georgia. Between North and South Carolina there are extensive interstate marshes. The Okefinokee swamps of Georgia must have their drainage outlets across the state of Florida. The Tombigbee Valley in Mississippi lies above the same valley in Alabama. The Pearl River bottoms

[5] United States Geological Survey estimates. 60 Congress, 1 session, *Senate Document 443;* G. E. Mitchell in *World Today*, 13:777.

[6] G. E. Mitchell, *World Today*, 13:777. (This was as early as 1907); Newell, W. D. Address at St. Paul, 1910.

occupy parts of Mississippi and Louisiana. The St. Francis Basin extends into both Missouri and Arkansas, while the swamp areas of the Red River of the North occupy Minnesota and North Dakota, and those of the Kankakee, both Indiana and Illinois. In short, the greater part of our swamp reclamation problems are interstate.

Not to speak again of the unnecessary waste of time, effort, and money that results from drainage by arbitrary territorial organs in disregard of topographical considerations, the injustice of such a lack of system upon landowners concerned may be illustrated by the situation in the St. Francis Basin. On the two sides of the Arkansas-Missouri boundary line, there are separate jurisdictions, different laws and processes, and engineers and drainage authorities working independently of each other. Missouri has already drained a large amount of land in the Basin, and the people of Arkansas are already taxing themselves to pay for the removal from their lands of this water. And as soon as Arkansas carries on reclamation work on any large scale, its landowners will have to spend a considerable part of their ditch-money in the proper disposal of the water which the people of Missouri have thrown upon them in draining the Missouri portions of the St. Francis Basin. It is clear that the logical manner in which to solve the problem of the Basin would be to drain it as a single unit, and assess the cost according to individual benefits in complete disregard of state lines or governmental divisions. It may be argued that in such a case the need of concerted action may be conceded, but that the remedy is to be found, not in action by the federal government, but in the coöperation of interested states in interstate drainage. Yet in the St. Francis Basin there is not the remotest possibility of joint action by Missouri and Arkansas; and up to the present time there has not been a single successful example of state coöperation in the reclamation of an interstate swamp. Some authority with jurisdiction greater than that of any state is needed, and the longer haphazard work is continued the greater will be the economic waste. The federal government is the only authority with powers broad enough or jurisdiction sufficiently extensive to bring about the reclamation of interstate swamps; it is prepared to do the work and its success in the irrigation of arid lands warrants the conviction that it would be a most efficient agent in the reclamation of swamps.

APPENDIX I

Drainage Statutes of States Other Than Minnesota

Arizona. Arizona Laws, 1 Session, 1912, ch. 38. (May 16, 1912.) Usual act, Election is held on question of establishing a drainage district; all real property owners in the district qualified as electors. The drainage commissioners are in two classes, and rotate in office with two year terms, being elected. Special election is held on question of bond issues. If bonds are insufficient, then an assessment may be levied after the election. Public purpose is required.

Arkansas. Kirby's Digest of Statutes, 1904, secs. 1414-1450. Act of April 23, 1903 (secs. 1414-1450, Kirby's Digest) was held constitutional in Beasley v. Gravette, 86 Arkansas. Amended and supplemented by Acts of 1907, acts 111, 432, 49; Acts of 1909, acts 181 and 279; Acts of 1907, act 314; Acts of 1911, acts 221, 54, 49, 136. Mandamus is authorized at various stages to compel action by the boards and commissions concerned in drainage work, and to expedite proceedings. This is a variation from general method adopted in most states to guard against delay, which is to prescribe a fixed time within which a given step in the procedure must be taken or completed. If bonds or interest coupons are unpaid thirty days after maturity, a court of chancery, on suit brought, may appoint a receiver to collect the taxes assessed. Public purpose or benefit is required.

California. Statutes, 1885, 204, ch. clviii, amended by Statutes, 1891, 262, ch. clxxxii. (Henning, General Laws, 1905, pp. 370-372.) Statutes, 1903, 354, ch. cclviii. (Henning, General Laws, 1905, pp. 414-417.) Very brief act, containing nothing unusual. There are various special laws for draining lands in particular counties such as Statutes 1865-66, 451; Statutes 1877-78, 1037; Statutes 1913, ch. 99. Especially important of these at the present time are, Statutes 1905, 443, ch. cccLxviii relating to the Sacramento Drainage District, and Statutes 1913, ch. 170, relating to Sacramento and San Joaquim Drainage District. By Statutes 1900, Extra Session Number 20, ch. xii, office of Commissioner of Public Works, appointed by governor for four years, was created, one of his duties being such examination and supervision of drainage works constructed under the laws of the state, as the governor might direct. In general, the California laws are so brief, and several steps in procedure so imperfectly treated, or not at all, that it is doubtful whether it can be cited to support the general text above as to drainage laws in general.

Colorado. Session Laws, 1911, ch. 124, expressly repealing Session Laws, 1909, ch. 161. Under certain conditions the county commissioners may dispense with an election; but must order one if so petitioned. In absence of election the county board itself supervises the work of construction; but if there is an election, three directors are chosen, who have charge of subsequent proceedings, such directors having fixed terms and rotating in office. Directors may issue bonds after an election on the question. Legality of establishment of the district cannot be called in question, if one year has elapsed without quo warranto proceedings having been instituted. Voluntary districts may also be organized. In general features and to some extent in phraseology the Colorado statutes are similar to those of Minnesota, though not quite so complete. Public purpose must be found.

Connecticut. General Statutes Revision of 1902, title 40, ch. 248. (Original acts are of 1861, 1862, 1864, and 1877.) secs. 4489-4499 and 4513. Act is very short. Authorizes formation of drainage companies on petition to superior court of county, which fixes bounds of the company, and appoints two "scavengers" who call first meeting of the company, which thereafter holds annual meetings for the election of clerk, treasurer, collector of taxes, and one scavenger, the last being general manager, and estimater of benefits. The company has power to open, repair, and enlarge

ditches, levy taxes, etc. (An act of 1862 provides for a similar organization through the justices of the peace.)

General Statutes Revision of 1902, title 40, ch. 249 (Original acts are 1711, 1750, 1821, 1732, 1846, 1673, 1728, 1702, 1864, 1853 and 1858) secs. 4500-4513. Amended by Public Acts of Conn. 1903, ch. 48. Work may also be carried on under two commissioners of sewers appointed by the superior court of any county on petition of landowners therein, viewers being appointed by the court and proceedings supervised by it. The Connecticut laws on drainage of marsh land are very brief and sketchy in character, not providing for bond issues, nor referring at all to the necessity of any public benefit appearing in either petition or findings.

DELAWARE. Laws of Delaware, volume 13, ch. 444 (Revised Code of 1852 as amended to 1893, ch. 59.) (The original act is of March 4, 1869.) Amended by volume 15, ch. 401; volume 16, ch. 90; volume 19, ch. 138; volume 21, ch. 257. (Volume 20, ch. 447, is no longer in force, having been repealed by volume 21, ch. 255.) Act is similar to that of Connecticut in simplicity of proceedings, and absence of any reference to a public purpose for the taking of lands of private persons. County commissioners have charge of proceedings until manager and treasurer are chosen by taxables at their first meeting, such officers being elected thereafter at annual meeting. Before work is commenced damages must first be paid to owners of lands taken or injured. At meetings of taxables each one has one vote for every dollar of taxes paid by him.

Laws of Delaware, volume 17, ch. 147 (Revised Code of 1852, as amended to 1893, page 570 et seq. in ch. 30.) Drainage corporations are authorized, and may enter on lands of private owners to do work and build ditches, after paying damages determined by commissioners appointed by the superior court. (The original act was passed March 14, 1883.) Laws of Delaware, 1901, ch. 167, sec. 71. (Same as volume 22, ch. 167.) Similar act relating to drainage corporations. Money for work done is raised by taxation of taxables "according to the nature of their property." (Amended by volume 22, Laws of Delaware, ch. 393; volume 23, ch. 154; volume 25, ch. 157.) And ch. 394 of volume 22, by ch. 156, of volume 25. Volume 13, ch. 444, is amended slightly by volume 24, ch. 154; volume 19, ch. 138; and volume 25, ch. 139. Volume 26, ch. 168, is amended by Laws 1913, ch. 160. The following acts relate to the incorporations of certain particular named drainage companies, and are therefore special in character, but still in force and effect, volume 19, ch. 659, and ch. 662; and chs. 660, 663, 665, 668. Volume 20, chs. 46, 47, 45, 48, 467-479. Volume 21, ch. 258. (Some of these acts amend special acts concerning named companies originally passed as early as January 22, 1831.) The following acts now in force relate to certain specified districts or counties in the state, and are therefore also special in character. Volume 19, chs. 661, 664, 669, 667. Another special act is Laws 1913, ch. 161. A house joint resolution entitled Laws 1913, ch. 310, named certain persons as commissioners to view the swamps of the state, and report to the next legislature as to method of draining these lands, estimated cost of such work, and the value of such lands when reclaimed.

FLORIDA. General Statutes of 1906, chs. 15 and 16, secs. 922-960, added to and amended by Laws 1905, ch. 5378; Laws 1911, ch. 6190; Laws 1913, ch. 6457. (Original act is Acts 1893, ch. 4178.) Petition to clerk of county by two or more landowners with bond. Proceedings under county commissioners. Anyone filing protest with bond for costs may cause the county board to appoint reviewers. Usual act otherwise; and very similar even in phraseology to Laws, Minnesota 1905, ch. 230, except more brief. Public purpose necessary.

General Statutes of 1906, ch. 16, secs. 950-960. (Original acts are Acts 1901, ch. 5035 and Acts 1903, ch. 5201, secs. 12 and 13.) On petition by majority of landowners "a public ditch" may be constructed in proceedings similar to those provided in ch. 15, but this act (ch. 16), does not prescribe that the work must be of public benefit; it may be merely for benefit of owners of private lands drained, unless application of statute is confined or limited by use of phrase "public ditch" in beginning of act as stated above.

Laws 1905, ch. 5377, creates a board of drainage commissioners composed of governor, comptroller, state treasurer, attorney general, and the state commissioner of agriculture, and authorizes the board to establish drainage systems, exercise the right of eminent domain, organize drainage districts, and levy acreage tax therein not exceeding ten cents per acre per annum to be collected by the county tax collectors. Amended by Laws 1907, ch. 5709, which itself specifies boundaries of a

single drainage district, and levies a tax of five cents per acre per annum on lands therein, the proceeds to be applied to their reclamation. (Apparently the commission now has no longer the power to itself establish drainage districts.)

Laws 1911, ch. 6297, is a special act creating a drainage district in Putnam county, and is similar to Laws 1905, ch. 5377, and to Laws 1907, ch. 5709, except that board of county commissioners and their successors are to be the controlling authority.

Laws 1913, ch. 6456. Establishes the Everglades Drainage District, levies a tax therein and places reclamation work therein under the board of commissioners of the Everglades Drainage District. This board is composed of the governor, comptroller, state treasurer, attorney general, and commissioner of agriculture, and it is given all the powers conferred by Laws 1905, ch. 5377, and Laws 1907, ch. 5709. (This act apparently supersedes prior act and is statute under which state work is being carried on at the present time.)

GEORGIA. Laws 1911, Number 265. Amended by Laws 1913, Number 169. Usual act except that the court to have jurisdiction of drainage matters in the county is composed of the clerk of the superior court, to whom the petition is first presented, and the board of commissioners of roads and revenues, or if there be no such board in the county, then the ordinary of the county. After the district is established then the landowners in the district elect three drainage commissioners who constitute a body corporate to carry on the work, condemn and acquire property, assess costs, and issue bonds of the district. (The act is fairly clear, but no marked similarity to the Minnesota statute.) A public benefit is necessary. This is the main act in Georgia.

Georgia Code of 1911, art. 12, secs. 432-439 and 5235. (Original acts are Acts 1878-1879, p. 171; Acts 1893, p. 112; Acts 1897, p. 34, and Acts 1898, p. 54.) Any county may establish ditches when "it shall judge the same to be proper." But evidently consent of owners of lands taken or injured is necessary, except in case of the "coast counties" which have the right of eminent domain and may proceed to take private property under the general statutes of the state regarding the exercise of that power. The procedure is the same as that for the establishment of public roads, that is, on application to the ordinary, the latter appoints three commissioners who must find road to be of public utility; the amount of damages to any individual owner may be referred to a jury of freeholders for determination. (The statutes relating to road procedure are Code of 1911, secs. 640-646; 678-689.)

IDAHO. Session Laws 1913, ch. 16. Usual statute. Petition is presented to clerk of the district court, which court appoints three drainage commissioners to have charge of the work, and continues to appoint them for three-year terms. Board of drainage commissioners may issue bonds without any election being required to give them authority for such issues. (Act is not similar to that of Minnesota in arrangement or phraseology; and it might be more clearly drawn.)

The statute of 1913 was passed as an emergency act, the reason given being that there "is no law on the subject now in force in the state." But Session Laws 1911, ch. 125 (a mere brief paragraph) had authorized the construction of drainage ditches across lands of non-consenting owners under the exercise of the power of eminent domain in proceedings already provided in relation to irrigation works. And Laws 1903, ch. 256, as amended by Laws 1907, ch. 98 (Idaho Revised Code 1908, Title 15), had provided procedure on petition to county commissioners, and the election of a board of drainage commissioners. (This act is very similar to the drainage statute of Washington, and apparently modeled upon the latter law. See Ballinger Annotated Washington Code. Title 27.)

ILLINOIS. Hurd's Revised Statutes of Illinois 1913, ch. 42 (Original act is Laws 1879, p. 120. The principal amending acts are Laws 1885, p. 109, and Laws 1913, p. 260. For references to the very large number of acts amending or supplementing the statute of 1879, see Hurd's Revised Statutes of Illinois 1913, ch. 42.) The petition is presented to the county court which appoints three commissioners to view the lands in the proposed drainage district, let contracts, and supervise the work. (See secs. 2, 5, 28 and 38 of ch. 42.) A jury is impanelled to determine benefits and damages to individual landowners. The usual proceedings by petition require the signature of a majority of the owners of land in the proposed district representing one third of the area of the land, or one third of the number of owners representing a majority of acres (See sec. 2, ch. 42), but it is provided that on petition of one fifth of the land owners a special election may be held to decide whether

or not the proposed district shall be organized. This election is conducted under the general election laws of the state. (See sec. 65, ch. 42.) A public purpose is necessary. Act is typical.

There is also provision in the statutes of Illinois for procedure in single townships under supervision of township officers, commissioners of highways, and justices of the peace (Laws 1885, p. 109. Revised Statutes 1913, sec. 75, et seq.); and an important act of special character is Laws 1913, p. 277, which relates to the Kaskaskia Island Sanitary and Levee District.

INDIANA. Burn's Annotated Indiana Statutes 1908, ch. 56, secs. 6140-6174. Amended and supplemented by Acts 1909, ch. 2; Acts 1909, ch. 173; Acts 1911, ch. 208; Acts 1911, ch. 288; Acts 1913, ch. 342. Drainage commissioner is appointed by the board of county commissioners in each county of the state, and is removable by it; the county surveyor is ex-officio the second drainage commissioner; the third is appointed by the court if it deems the initial petition sufficient. The petition is presented to the circuit or superior court. Drainage bonds may be issued only if the cost of the work exceeds $5,000. If land is wholly in one county, then the petition may be presented to the county commissioners, and procedure through them. Acts 1913, ch. 331, provides procedure for cases where a drain affects lands in an adjoining state. A public benefit is necessary. (See Burn's Annotated Statutes 1908, ch. 56, sec. 6143.)

IOWA. 19 General Assembly, ch. 44; 16 General Assembly, ch. 140; 18 General Assembly, ch. 85; 21 General Assembly, ch. 139; 17 General Assembly, ch. 121; 20 General Assembly, ch. 186; 22 General Assembly, ch. 97; 22 General Assembly, ch. 96; 20 General Assembly, ch. 188; 21 General Assembly, ch. 55; Code 1873, secs. 1207-1216, and sec. 1227. Code of 1897, Title x, ch. 2, secs. 1939-1966. Usual procedure through county board. If claims for damages are made then the auditor appoints the appraisers instead of the board of county commissioners. Bonds may be issued without any election. Before work is commenced the claims for damages must have been paid or secured by persons benefited by the ditch. In case landowner wishes to construct a drain across adjoining land, and cannot agree with its owner as to its construction, appeal may be had to township trustees who may establish the ditch after a hearing, but the petitioner must pay the damages awarded by the trustees and costs of the proceedings before commencing actual construction work.

19 General Assembly, ch. 44; 18 General Assembly, ch. 85; 16 General Assembly, ch. 140; 31 General Assembly, ch. 9; 21 General Assembly, ch. 139; 29 General Assembly, ch. 78; 30 General Assembly, ch. 67; 20 General Assembly, ch. 186; 31 General Assembly, ch. 82; 26 General Assembly, ch. 46; 31 General Assembly, ch. 83; 32 General Assembly, ch. 93; 30 General Assembly, ch. 68; 30 General Assembly, ch. 69; 30 General Assembly, ch. 70; 31 General Assembly, chs. 9, 85, 84, 86; 32 General Assembly, chs. 94 and 95. Code of Iowa Supplement of 1907, Title x, chs. 2 and 2A. (The code of 1897 and code supplement of 1907 have been amended by 32 General Assembly, chs. 93-95; 33 General Assembly, chs. 117-122; 34 General Assembly, chs. 85-89; 35 General Assembly, chs. 153-159.) Subdistricts may be created within drainage districts for more complete drainage of part of lands in the district on proceedings similar to those prescribed for the original establishment of a drainage district. Joint action of officials of more than one county is provided for in cases where the proposed ditch extends into more than one county. In case the officials of any county refuse to co-operate or act with others, then on petition the district court of any county concerned may order the ditch to be established.

In the statutes of Iowa a public purpose is a prerequisite to the establishment of a ditch. (See Code 1897, secs. 1939 and 1941.) The Iowa procedure is typical.

KANSAS. Laws 1911, ch. 168. Majority in interest of owners of land in any contiguous body of swamp may form a drainage district by signing articles of association obligating themselves to pay the cost of drainage works to be constructed, filing the articles in the office of the clerk of the district court of the county. Then summons is issued against non-consenting or non-signing landowners returnable at the next term of the district court of the county, at which time the court may summarily declare such drainage district a public corporation after hearing those who object to having their lands assessed for the work. Landowners then elect five supervisors, each acre having one vote. Annual elections are held thereafter. The supervisors have survey and plans made by an engineer, confirm assessments after hearing, supervise work, issue bonds, and let contracts. The procedure in other respects is the usual one. A public benefit must appear. (See General Statutes 1909, sec. 2987.)

Kansas Laws 1911, ch. 168, does not refer to any other or prior acts relating to drainage, but is a complete and separate statute on the subject. There are, however, other drainage laws still in force in the state, which are of the usual character. These provide for (1) township drainage; (2) proceedings through county commissioners with appeals to the probate courts; (3) instead of such county procedure for single ditches, the county board may establish or incorporate permanent drainage districts, the powers of such public corporations to be exercised by a board of five men elected by all the taxpayers in the district. (This board has usual powers as to supervision, and bond issues.) (4) proceedings through the district court in certain cases. General Statutes 1909, ch. 34, secs. 2968-3074. Amended by Laws 1913, ch. 184.

KENTUCKY. Acts 1912, ch. 132. Proceedings are under supervision of county judge, who orders establishment of drainage district if no exceptions are taken to the viewers' report. If exceptions are taken then a jury trial may be had on demand. After the drainage district is established and the report of the viewers confirmed by the court, the work is under the control of drainage commissioners appointed for four-year terms by the county judge, and reappointed by him as their terms expire. The damages allowed, "shall be considered separate and apart from any benefit the land would receive because of the proposed work." The act is the usual one except that it provides that on petition of one fourth or more of the total number of landowners affected by and owning fifty per cent or more of the total number of acres in a proposed district, the court must permit the district to be organized as a separate and distinct district under the control, not of the permanent drainage commissioners of the county (appointed by the court under the above statute) but of a board elected by the landowners. If the total assessment exceeds twenty-five cents per acre then the board of drainage commissioners may issue bonds for the amount of unpaid assessments, after publication, and any person neglecting to pay his assessment when due is deemed to consent to the issuing of such drainage bonds; and in consideration of the right to pay his assessments in installments he thereby waives his right to any defense against the collection of the assessments because of any illegality, irregularity, or defect in prior proceedings. (The act of 1912 repeals inconsistent acts, and therefore apparently repeals Kentucky Statutes 1903, secs. 2380-2412A.. Originally act of July 1, 1893, superseded or amended by acts of March 23, 1900; March 21, 1902; and March 27, 1902; as amended by act of March 21, 1906, i. e., Acts 1906, ch. 76, and by Acts 1906, ch. 150, and by Acts 1908, chs. 23 and 73.) But the act of 1912 expressly saves from repeal act of March 19, 1894 (Statutes 1903, secs. 2413-2417) and act of March 24, 1906 (Statutes 1903, sec. 2417A, or Acts 1906, ch. 151.)

Act of March 19, 1894 (Statutes 1903, secs. 2413-2417 and still in force by express exception from repealing clause of act of 1912) authorizes counties to drain swamp lands, and pay for such work out of the county levy derived from the taxation of all taxable property in the county, provided that such swamp lands cause sickness in the county.

Acts 1912, ch. 132, provides that viewers must report as to whether the work will be of public benefit, but there is no express duty on the court to so find.

Act of March 24, 1906, ch. 151 (Statutes 1903, sec. 2417A, and also still in force by virtue of exception from repealing section of Acts 1912, ch. 132) legalizes and continues corporations heretofore formed for drainage purposes under the laws of Kentucky.

LOUISIANA. Acts 1910, Act Number 317, amending Act 159 of 1902 and Act 135 of 1906. (The older statute regarding drainage is Act 37 of 1894 for which see Wolff's Constitution and Revised Laws of Louisiana 1904, secs. 1282-1284.) Acts 1906, Act Number 103. The statutes of Louisiana are less typical than those of most states, for example, Illinois, Indiana, Minnesota. No petition is provided for, and there is consequently no way for private owners to institute proceedings or compel the public authorities to act, but the police juries must take the initiative in organizing drainage districts. (See Act 317 of 1910, sec. 1.) Three of the five drainage commissioners who have charge of the work in each district are chosen by the police juries; the other two are appointed by the governor of the state. (See Act 317 of 1910, sec. 3.) The drainage commissioners may levy forced contributions or acreage taxes after petition by the owners of two thirds of the land in the district, or after an election participated in by all the property-owning taxpayers who have qualified as electors in the district. (See Act 256 of 1910, sec. 4.) The drainage

taxes are assessed against all property subject to state taxation in the drainage district, and not by special commissioners or drainage assessors, as is usually the case in drainage proceedings, but by the parish officials who make the assessments for state taxes. (See Act 317 of 1910, sec. 13.) The board of state engineers is required to make surveys and estimates as to the cost of proposed drainage works, lay off canals and levees, and "perform any and all other services in connection with the drainage and reclaiming of the lands of any district that may be required by the commissioners of said district." But the drainage district must pay all expenses incurred by the board in making surveys. (See Act 317 of 1910, sec. 21.) It is also the duty of the board to give special study to the drainage of swamp lands. (See Act 317 of 1910, sec. 25.) The power and duties of the state board of engineers, and of the governor, with respect to the appointment of some of the members of the drainage commissions, give the state government an opportunity to exercise some influence in the direction of better work and the planning of drainage projects with a view to the interests of the state at large.

Constitution of 1898, Art. 281, contains detailed provisions relating to drainage. It authorizes municipal corporations, parishes, and drainage districts to issue bonds for drainage works, thereby recognizing their right to construct drainage works as well as the existence of drainage districts, the latter nowhere else in the constitution being referred to. It has been held that the constitution contemplates that drainage districts should be separate entities, but that nevertheless the legislature might authorize police juries to establish drainage districts. See Mayor, etc. v. New Iberia, and Bayou, etc., District v. New Iberia 106 La. 651. (For amendment to Constitution 1898, Art. 281, proposed in 1906, see Act 122 of 1906.)

MAINE. Revised Statutes 1903, ch. 21, secs. 28-35. Statute one page in length providing for proceedings on petition through county commissioners, but damages assessed by the board after report from viewers must be paid by petitioners, and there is no provision for organization of a permanent drainage district or the issuance of bonds, or for appeals to the courts. Nothing whatever is required as to public character of the work, and evidently it is sufficient, so far as the statute is concerned, to justify the establishment of a ditch and the taking of lands therefor, merely to find that the work will be of benefit to the lands of the petitioners.

Revised Satutes 1903, ch. 26, secs. 42-70. Similar to ch. 21, secs. 28-35, except that procedure is by petition to supreme court of the county which appoints three commissioners to act as viewers, and have charge of the work, and appeals may be taken to the courts. Work is paid for out of moneys collected by a collector appointed by the drainage commissioners. After the ditch is constructed the proprietors may prescribe rules for its maintenance at meetings held for that purpose, each owner being entitled to vote in proportion to the number of acres owned by him.

It will be noted that these statutes of Maine are similar in their brevity, general provisions, and early enactment, to the drain laws of several other eastern states, such as Massachusetts, Delaware, Maryland (code of 1911), New Jersey, Pennsylvania, Rhode Island, Vermont and West Virginia. They are so different from such public drainage statutes as those of Illinois, and Minnesota, for example, that they do not support the discussion of drainage statutes in general as given in the text, and are merely given to show that the states in which they are in force, are not entirely without drainage legislation.

MARYLAND. Laws 1912, ch. 656. This is now the principal drainage act of the state, and is typical in every respect. There are the usual provisions for the appointment of a board of drainage commissioners, the issuing of bonds, and the organization of permanent drainage districts by means of procedure through the county commissioners. Although the statute in its title recites that it is to promote public health, convenience, and welfare, and the viewers are to report as to that matter, yet the county commissioners, in establishing the district have merely to find that the total benefits exceed the total costs. Sec. 27 appropriates $10,000 to constitute a drainage fund to be loaned, in sums not exceeding $2,000, for the expenses of any ditch project up to the time of the establishment of the drain.

Bagby's Annotated Code of Maryland, 1911, art. 25, secs. 36-87. (Original acts forming basis of code sections were passed as early as 1858.) Amended by Laws 1912, ch. 64. This is a brief statute similar to those of Maine and other eastern states, and not typical of drainage statutes discussed in the text. (See paragraphs on Maine statutes supra.) Procedure is under control of county commissioners until

the taxables, voting in proportion to the amount of taxes paid by each of them, choose a board of managers and treasurer who then supervise the work. The treasurer may by ordinary civil action compel payment by those defaulting in meeting their assessments. There is no provision for bond issues, and nothing as to the necessity of any benefit to the public. (Some counties are expressly exempted from the provisions of the statutes. For an example, relating to Somerset county, see Laws 1912, ch. 802.)

MASSACHUSETTS. Revised Laws 1902, ch. 195, secs, 1-16. (Original acts are Acts of 1702, ch. 11; 1795, ch. 62; 1745-1746, ch. 16; 1885, ch. 384.) Very brief statutes providing procedure through the superior court of the county which need merely find that the ditch will be "for the general advantage of the proprietors." Commissioners are appointed by the court, and assessments collected by a collector without bond issue or the organization of any permanent drainage district. This statute is of the same kind as those of Maryland and other eastern states referred to in discussion of laws of Maine and Maryland supra.

Revised Laws 1902, ch. 195, secs. 17-25. (Original acts are Acts 1855, ch. 104, and Acts 1857, ch. 292.) This is similar to Revised Laws 1902, ch. 195, secs. 1-16, except that procedure is through the county commissioners instead of through the court.

Acts 1913, ch. 759. This authorizes the state board of agriculture and the state board of health, acting as a joint board, with the approval of the governor and council to take wet lands (except salt marshes) under the power of eminent domain, and reclaim them by prison labor, use two years' crops for state institutions, and then sell the lands to form a "wet lands reclamation fund"; $15,000 is appropriated for the work. (See also Acts 1913, ch. 633.)

MICHIGAN. Howell's Annotated Statutes 1912, Title XII, ch. 45, secs, 3366-3477. (Original acts were passed as early as 1857, and are very numerous.) Amended by Public Acts of 1913, Number 249. These statutes are typical. Each county has an official known as a drain commissioner. He is elected for a term of two years, and he lets the contracts and has general supervision of the drainage work. There is provision for the appointment of a special drain commissioner in cases where the regularly elected one is interested in the proceedings. The petition must be approved, and the necessity of the drain and its public character determined, by the township board. In case the drain commissioners of adjoining counties cannot agree as to matters connected with the construction of a ditch extending through more than one county, they may appeal to the highway commissioner of the state for a settlement of their differences.

MINNESOTA. (See chapter on drainage procedure in Minnesota.)

MISSISSIPPI. Laws 1906, ch. 132. Evidently same as Mississippi Code of 1906, secs. 1682-1727. The code sections are amended by Laws 1908, ch. 173; and by Laws 1910, chs. 188-191. This act, which apparently is not very carefully drawn, authorizes proceedings through the chancery court of the county, and contains the usual provisions, and in addition provides particularly for compensation by upper districts to lower ones. Ten named counties are excepted from the provisions of the statute. There is no reference in the act to any necessity of the public purpose of the work appearing.

Laws 1902, ch. 70. (Code of 1906, secs. 371-391.) Procedure through county supervisors is provided, the viewers being named in the petition, but the supervisors themselves having control of the work throughout the proceedings and the construction of the ditch. Land may be taken under the general laws of the state relating to the exercise of the power of eminent domain.

Laws 1908, ch. 141, expressly provides that drainage bonds shall be exempt from state taxation. And Laws 1908, ch. 147, creates the Tallahatchie Drainage District and incorporates its commission which is appointed by the governor for four-year terms, and authorized and empowered to drain the swamp lands of the district.

MISSOURI. Revised Statutes 1909, ch. 41, secs. 5496-5661. Amended by Laws 1911, Acts of March 30, 1911, p. 205; April 12, 1911, p. 222; April 12, 1911, p. 223; April 12, 1911, p. 225; and by Laws 1913, Acts of March 24, 1913, p. 233; March, 27, 1913, p. 267; March 25, 1913, p. 281. (See the last act especially.) These acts are of the usual character, and provide procedure through circuit courts, or county courts. Drainage works may also be constructed by action under the supervision of the latter courts without the organization of any permanent drainage district. (The Missouri laws are very complete, and are, as a rule, well draughted.)

MONTANA. Laws 1905, ch. 106. Amended by Laws 1909, ch. 144. Usual act. One drain commissioner is appointed by the board of county commissioners for a two-year term. He receives the petition and examines the lands without the aid of either viewers or engineers, and lays out the ditch. If releases cannot be secured from owners of land to be used for the ditch, the district court, after hearing and on application by the drain commissioner, appoints three commissioners to assess damages (but *not* benefits). On filing of their return the fee in land necessary for the drain vests in the county in trust for drainage purposes only, provided no appeal is taken. The county drain commissioner then establishes the drainage district and lets the contracts, and then assesses benefits himself; appeals to the district court may be had from his decision as to benefits. The statute is also slightly different from the usual drainage laws in that it contains an express prohibition of any restraint by injunction of assessment collection, unless the amount of the assessment is first paid into the county treasury as security. In case the drain extends through several counties, and condemnation of private land is necessary, the district court of any county on application of the regular drain commissioners, appoints three special drain commissioners to act together in the matter. The statutes do not provide for bond issues. To justify the establishment of a drain it may be beneficial to the public health *or* conducive to the improvement of lands, but probably a public purpose is regarded necessary.

NEBRASKA. Laws 1881, p. 236; Laws 1911, p. 453; Laws 1909, p. 504; Laws 1891, p. 360; Laws 1905, p. 608; Laws 1877, p. 160; Laws 1911, p. 466; Laws 1905, p. 616; Laws 1905, p. 529; Laws 1905, p. 632; Laws 1907, p. 474; Laws 1909, p. 511; Laws 1909, p. 531; Laws 1911, p. 485. Drainage is authorized by (1) county authorities; (2) incorporated companies; (3) individual landowners; (4) districts organized by the district courts of the state; (5) districts organized by vote of the landowners.

The county board act is very brief with usual steps, except that the board itself acts as viewers, and determines damages; and failure to make application in writing to the board for damages, before the hearing, shuts off any claim for damages. If more than one county is concerned, action is by joint action of the county boards. Public purpose is necessary.

Drainage may be by individual owners under the supervision of the county board with the customary appraisers, but no bond issues. The work in such cases may be for the public welfare, *or* sanitary or agricultural purposes. (As to public character of work see Jenal v. Green Island Drain Company, 12 Neb. 163.)

Evidently the principal act is that relating to the establishment of ditches by means of procedure in the district court, instituted by the filing of signed articles of association. The work is controlled by an elected board of supervisors. Here, as in the case of county ditches, a ditch must be for a public purpose or of public benefit.

NEVADA. Statutes of 1913, ch. 281. Usual proceedings in general features are provided. Petition is presented to the county board which appoints a board of three commissioners for three-year terms to have charge of the work. A special election is required to authorize the issue of bonds. The board of county commissioners, as a condition precedent to the appointment of commissioners, and the latter, as condition precedent to the establishment of the ditch and the making of assessments, need not necessarily find that the work will be of public benefit. It may be sufficient that the benefits to landowners exceed the costs of the drain construction.

Revised Laws 1912, sec. 5606, sub-secs. 3 and 5, states that among the public uses for which the power of eminent domain may be exercised, is that of draining and reclaiming lands. Except for this brief statutory provision there was no drainage legislation of a general character until the act of 1913.

NEW JERSEY. Compiled Statutes 1910, pp. 3241-3261. (Original acts were passed before 1878 revision, and amended since then.) These statutes relate to the drainage of tidewater lands, as distinguished from swamp or meadow grassland, the statutes relating to which are treated in the following paragraphs. Public purpose is unnecessary. Application is made to the court of common pleas to appoint commissioners to assess damages and lay out banks. Then the owners elect men to see to the construction and maintenance of the works. This procedure, and acts providing it, are similar to the statutes of such eastern states as Maine, Massachusetts, and Delaware, already referred to. Corporations may also be organized for the draining or protection and reclamation of tidewater lands.

Compiled Statutes 1910, pp. 3261-3271. (Original acts prior to 1878.) These provide simple procedure without bond issues through highway surveyors and chosen freeholders. Act is not typical. (Managers of geological survey are authorized to examine lands, make surveys, and adopt drainage system, reporting to the supreme court which appoints three commissioners to execute the work, with power to make assessments and issue bonds. Public Laws 1871, p. 25, as amended by Public Laws 1877, p. 662; Public Laws 1894, p. 268; Public Laws 1877, p. 71; Public Laws 1886, p. 342; Public Laws 1888, p. 208; Public Laws, 1906, p. 378. See Compiled Statutes 1910, pp. 3276-3284.)

Public Laws 1890, p. 495, as amended by Public Laws 1903, p. 702, and by Public Laws 1904, p. 239. This is a brief township drainage act.

Drainage is also authorized by the county authorities solely for benefits to public health (See Public Laws 1881, p. 265; Public Laws 1881, p. 195, as amended by Public Laws 1885, p. 279; by Public Laws 1886, p. 41; Public Laws 1887, p. 50; Public Laws 1888, p. 465; Public Laws 1889, p. 141; 1892, p. 47, and 1898, p. 373); and through the court of common pleas. (See Public Laws 1903, p. 131, as amended by the following public acts: 1908, p. 280; 1906, p. 303; 1907, p. 674; 1908, p. 285; 1910, p. 188; 1910, p. 191.) For further acts in New Jersey see Laws 1911, pp. 128 and 155; Laws 1913, pp. 162, 192, 632, 670.

In general the statutes of New Jersey do not expressly require any finding that a given work will be of public benefit or utility, except that certain acts provide for reclamation for sole purpose of improving the public health. (See paragraphs above.)

New Mexico. Laws 1912, ch. 84. The procedure is through the district court only. The statute is clearly drawn, and contains the usual provisions, except that one of the grounds of objection which may be urged at the first hearing, in addition to the usual ones such as the insufficiency of the petition, is "the constitutionality of the law." There is no mention of the necessity of public benefit from the ditch; the court need merely find that it will promote agricultural interests. And at the first hearing the court is confined solely to legal questions such as the sufficiency of the petition, and cannot exercise its discretion as to the possibility of the costs exceeding the benefits from the work, but must appoint viewers if the proceedings thus far are legally valid. To this extent, and with reference to the provision relating to "the constitutionality of the law," the New Mexico statute is very similar to Laws Wyoming 1911, ch. 95, and probably based upon it.

New York. Laws of 1909, ch. 20. Amended by Laws 1910, ch. 624. Usual statutes. The procedure is through either local courts on petition of the owners of a majority in acres of the land to be drained, or, through a representative of the conservation commission acting on the advice of the state engineer. In the latter case the initial petition need not be signed by more than one person.

North Carolina. Laws of 1909, ch. 442. Laws of 1911, ch. 67. The drainage laws of the state contain nothing unusual, except that the petition is filed with the clerk of the superior court of the county who may himself order the establishment of a ditch. He keeps a drainage record. Appeals may be carried to the supreme court of the state. After the drainage district has been established three drainage commissioners are appointed by the superior court of the county. One of the viewers must be an engineer. Bondholders may compel the levy of assessments by mandamus on six months' default in the payment of either principal or interest.

North Dakota. Laws 1895, ch. 51. Amended by Laws 1903, ch. 80; Laws 1899, ch. 79; Laws 1901, ch. 39; and by laws 1907, chs. 93 and 94; and by Laws 1911, chs. 124 and 125. The procedure is through the county commissioners, and the ditch must be found to be of public benefit. The laws are rather brief, and contain no unusual feature.

Ohio. Page and Adam's Annotated Ohio General Code 1910, secs. 6442-6535. Amended by Laws 1913, p. 185. This is a typical public drainage statute similar to those of Illinois and Minnesota. Jury trials may be had on demand. Proceedings under the county commissioners' supervision by this statute.

Page and Adam's Annotated Ohio General Code 1910, secs. 6536-6563 (48). Amended by Laws 1911, pp. 313-314, and pp. 575-585; and by Laws 1913, p. 185. This statute provides for joint action of the boards of county commissioners in cases where a ditch extends through more than one county. It contains no peculiar provisions.

Page and Adam's Annotated Ohio General Code 1910, secs. 6564-6595. By this

act similar proceedings are provided for in cases where a ditch may extend into a county in an adjoining state and be of benefit to lands therein.

All of the general drain laws of Ohio require a finding that the ditch will be of public benefit as a condition precedent to its establishment.

OKLAHOMA. Revised Laws 1910, ch. 27. (Original act is Act of August 24, 1908.) Amended by Laws 1911, ch. 132, and by Laws 1913, ch. 115; and Laws 1913, ch. 166. This act contains the usual provisions for procedure through the county commissioners and for joint action of county boards in cases where the drain extends into more than one county. To justify the taking of private property and the establishment of the drain, it is sufficient that the ditch may be of public benefit "or of agricultural interests."

OREGON. Lord's Oregon Laws 1910, secs. 6126-6146, and 6163-6166. (Original acts are Laws 1889, p. 25; Laws 1891, p. 47; Laws 1909, chs. 177, 44, and 133.) Amended by Laws 1911, chs. 142, 241, and 250. These statutes provide for the customary procedure through the county court on petition of twenty-five of the owners of lands "susceptible of one system of drainage," such petition giving the names of three persons willing to serve as trustees for one year. Petitioners make by-laws signed by a majority of persons owning land in the district, and providing a method for appointing subsequent trustees to carry on the work. The drainage district may bring an ordinary civil action to condemn lands. The statutes do not expressly require any finding that the ditch will be of public benefit or utility. As to eminent domain for drainage purposes in Oregon see Laws 1909, ch. 216, p. 342, amended by Laws 1911, ch. 238.

Lord's Oregon Laws 1910, secs. 5791-5799. (Original act is Laws 1868, p. 21. Amended by Laws 1905, ch. 149.) Amended by Laws 1913, ch. 52. Simple procedure through the county court for building a single ditch, without permanent organization or bond issues, without necessity of public benefit appearing, and with damages paid before work commenced.

Lord's Oregon Laws 1910, secs. 6147-6162. (Original acts are Laws of 1895, p. 117; 1909, ch. 146; 1905, ch. 199; 1907, ch. 146.) Usual proceedings through county court, but adapted to the drainage and protection of tidewater lands by diking districts.

Lord's Oregon Laws 1910, secs. 5800-5812. (Original act is Laws 1880, p. 53. Amended by Laws 1882, p. 56.) Relates to the organization of a drainage district in Washington county, and is therefore special in character.

Laws 1911, ch. 172, authorizes the formation of drainage corporations with the power of eminent domain.

Laws 1913, ch. 11, authorizes the state land board to contract for the drainage of lakes and swamps, and the sale of such lands to the reclaiming contractors. (Evidently similar to policy adopted by Florida for a time. See chapter on work in states other than Minnesota.)

PENNSYLVANIA. Act of April 4, 1863. (See Purdon's Digest, pp. 289-290, vol. 1.) Very brief act providing for petition to the court of quarter sessions, and the payment of damages by petitioners before constructing works, a public purpose not being expressly required, and no permanent organization provided.

Acts of April 5, 1870; May 9, 1871; June 15 ,1871; and May 19, 1871. (See Purdon's Digest, pp. 290-292, vol. 1.) Similar act not requiring public purpose, but not authorizing the assessment of any benefits against non-consenting landowners. Both statutes are like those in other eastern states such as Massachusetts, Maine, New Jersey, Delaware. Maryland.

RHODE ISLAND. Laws 1896, ch. 76. Statute similar to that of Pennsylvania, briefly providing for proceedings through township authorities, with costs paid by petitioner, and public purpose ignored.

SOUTH CAROLINA. Laws 1911, 27 Statutes, S. C., p. 92. This is the usual act and is similar to that of North Carolina. It provides that the clerk of the court of common pleas of the county perform the functions usual to board of county commissioners or county judge. He appoints a board of drainage commissioners to supervise the work, and issue bonds, etc. About seven counties are expressly excepted from the provisions of the statute. A public purpose is necessary. This is the principal statute now in force in the state.

Acts S. C. 1912, Number 411. This is a very brief act authorizing procedure through county commissioners who appoint the drainage commissioners who act as viewers and also supervise the work. But some steps are left out; no bonds are

authorized, and although the petition may state that the ditch is for the promotion "of public health, *or* to advance agricultural interests," no finding as to public benefits is necessary.

There are many special acts relating to particular counties, such as Code 1912, vol. 1, sec. 2196, et seq., but they have been held unconstitutional. See State v. Hammond, 66 S. C. 300. (As to these see also Code 1912, secs. 2239-2265.)

Laws 1907, 25 Statutes, S. C., p. 524. Governor, on petition of the majority of representatives to the state legislature from any county, may appoint with their approval a sanitary and drainage commission for that county, to have charge of public drains already built, and to make surveys. (As to drainage laws of South Carolina, see also Acts 1912, pp. 92, 101, 113, 107, 715, 731, and Acts 1913, pp. 65 and 69.)

SOUTH DAKOTA. Laws 1907, ch. 134; Laws 1909, chs. 69, 127, 102; Laws 1911, chs. 129, 130, 131. See also Compiled Laws of South Dakota 1909, vol. 1, ch. 25. Usual procedure through county commissioners, but state engineer receives copies of the petitions, and has some powers as to examination, recommendation, and supervision.

TENNESSEE. Public Acts 1909, ch. 185. Amended by Public Acts 1913, chs. 25 and 37. Usual act with authority vested in the county court. Public purpose necessary.

TEXAS. Acts 1895, p. 151. Amended by Acts 1897, p. 95, and Acts 1899, p. 242; Acts 1889, p. 95; Acts 1905, p. 212; Acts 1907, p. 78; Acts 1909, p. 24. See Revised Civil Statutes of Texas 1911, title 47. Typical acts with action through commissioner's court of the county. And Revised Civil Statutes 1911, secs. 1261-1267, authorized the formation of drainage corporations. These acts being indefinite and uncertain, however, are evidently superseded by General Laws 1911, ch. 118, and General Laws 1913, ch. 36, but the procedure in general is the same. General Laws 1913, ch. 28, provides a means of winding up the affairs of districts organized under the old statutes. In Texas a public benefit must be found to authorize the work.

UTAH. Compiled Laws 1907, title 20. Brief act containing nothing unusual. County commissioners may organize a district without finding it of public utility, and then landowners elect the trustees to carry on the work, issue bonds, etc.

VERMONT. Public Statutes 1906, ch. 182. Not a statute supporting the text discussion, but similar to those of Maine, Massachusetts, New Jersey, Delaware, Pennsylvania, and Rhode Island.

VIRGINIA. Acts 1906, ch. 188. Acts 1910, ch. 312, amended by Acts 1912, ch. 159. Similar to law of North Carolina, except that procedure is through the county circuit court itself instead of its clerk. A public benefit is made necessary by the act. No unusual provisions requiring comment.

WASHINGTON. Laws 1895, p. 271. Amended by Laws 1905, p. 360; 1909, extra session, p. 47; 1909, p. 563; 1901, p. 181; 1907, pp. 101, 376, 219, 669; 1903, p. 42; 1909, p. 690; see Remington and Ballinger's Annotated Code, secs. 4137-4181. Amended by Laws 1913, chs. 42 and 86. Proceedings under control of county commissioners who order an election to determine question of establishing drainage district, and to choose drainage commissioners, if they find that the proposed work will be of public benefit. If additional works are desired, the drainage district petitions the superior court of the county, which must find them a public benefit.

Laws 1895, p. 304. Amended by Laws 1905, p. 171; 1899, p. 187; 1901, p. 226; 1907, p. 175; 1909, p. 630. See Remington and Ballinger's Annotated Code, secs. 4091-4136. Amended by Laws 1913, ch. 89. These are similar statutes relating to diking districts for the tidewater counties.

Laws 1909, p. 789. See Remington and Ballinger's Annotated Code, secs. 4182-4214. Ditches and dikes in more than one county may be constructed by joint motion of county commissioners, notice being given to them by the commissioner of public lands of the state.

Laws 1913, ch. 60. Creates a state department of agriculture, and by sec. 12, one of its duties is to make surveys of lands affected by drainage projects and a classification of them.

Laws 1895, p. 142, and amendments thereof, provides for payment of expenses of work already done under Laws 1890, which was declared unconstitutional in Askam v. King County, 9 Wash. 1, and in Skagit County v. Stiles, 10 Wash. 388, as permitting the taking of private property for a private purpose, and superseded by Laws 1895, p. 271, which requires a public benefit to appear. As a result of similar adverse decisions, Remington and Ballinger's Annotated Code, secs. 4215-4267, as amended by Laws 1911, ch. 97, is superseded by Laws 1913, ch. 176.

WEST VIRGINIA. Code Virginia 1860, ch. 124. See Code of West Virginia 1906, secs. 3189, 3191. Merely two brief paragraphs not requiring public purpose, providing no permanent organization; requiring expenses to be paid by petitioners, and therefor similar to acts of other eastern states such as Maine.

WISCONSIN. Statutes 1913, secs. 1379 (11), to 1379 (31e). (Original act is Laws 1891, ch. 401. Frequent amendments.) The chief act. A permanent drainage district may be formed by petition to the circuit court. A public purpose is necessary. Nothing unusual, except that the petition must contain a report from the college of agriculture as to soil, probable costs and benefits, etc.; and there is provision for a determination of the constitutionality of the law by the circuit court at the first hearing. This, however, differs from the New Mexico statute, in that in this case the judge must not only find the law valid, but must also find the work of public benefit. This is similar to the Wyoming statute as to constitutionality.

Statutes 1913, secs. 1372-1379. (Original act since often amended is Acts 1862, ch. 398.) Typical county board act.

Statutes 1913, secs. 1359-1367. (Original is Acts 1862, ch. 398.) Brief law relating to town drains, and containing nothing unusual.

In Wisconsin a public purpose is necessary. (Statutes 1913, sec. 1379 [14].)

(Prof. E. R. Jones of the University of Wisconsin, in a letter to writer, April 17, 1912, points out that the chief objection to the drainage district law is that it is rather cumbersome in its initial steps, so that legal costs are very large, and average 20 per cent of the entire expense of the drain, in one case being 40 per cent.)

WYOMING. Laws 1911, ch. 95. Usual act through the district court, which, however, must appoint commissioners if it finds that petition and notice are sufficient, that it has secured jurisdiction, and that the law is constitutional. In this last respect the law is like that of New Mexico (Laws 1912, ch. 84), but differs from it and is similar to that of Wisconsin in that a public benefit must appear to the court in Wyoming.

SUMMARY. States without general drainage statutes are two: Alabama and New Hampshire.

States with brief, older, and more private laws are ten: Connecticut, Delaware, Maine, Maryland (Code of 1911), Massachusetts, New Jersey, Pennsylvania, Rhode Island, Vermont, and West Virginia.

The other states have statutes in general of the type set forth in the text. Thirty-six.

Although in some states because of the statutes reading in the alternative as to the necessity of a specific finding that a given ditch will be of public benefit (e. g., that court shall find that drain will be of public benefit, *or* increase the value of agricultural lands), the question is somewhat in doubt, yet it is probably safe to say that all the drainage laws require such a benefit to appear, except the following thirteen, which are the same as the ten eastern states named above and New Mexico, Utah, and Mississippi (Laws 1906, ch. 132.) (Of course some of the New Jersey Laws are solely for public health purposes.)

APPENDIX II

Drainage Laws of Minnesota

GENERAL ACTS

General Laws, 1858, ch. 73
General Laws, 1866, ch. 27
General Laws, 1867, ch. 40
General Laws, 1874, ch. 57
General Laws, 1877 ch. 55
General Laws, 1877, ch. 91
General Laws, 1878, ch. 39
General Laws, 1879, ch 38.
General Laws, 1883, chs. 108, 139
General Laws, 1885, chs. 25, 51, 69, 71.
General Laws, 1887, chs, 97, 98, 99
General Laws, 1889, ch. 168
Laws, 1893, chs. 152, 221
Laws, 1895, chs. 81, 164, 82, 84, 95, 96, 293, 378, 403, 83
Laws, 1897, chs. 105, 180, 328, 103, 318, 142, 155
Laws, 1899, chs. 274, 323, 347
Laws, 1901, chs. 76, 90, 258, 381
Laws, 1902, chs, 38, 39
Laws, 1903, chs. 178, 311, 315, 285, 386, 188, 217
Laws, 1905, chs. 230, 106, 157, 145, 247, 180, 311
Laws, 1907, chs. 19, 371, 366, 191, 75, 330, 448, 470, 367, 138, 246, 363, 72, 9
Laws, 1909, chs. 377, 469, 127, 207, 336, 375, 471, 422, 257, 44, 83, 10, 191, 118, 119
Laws, 1911, chs. 113, 384, 370, 278, 138, 54, 272, 273
Laws, 1913, chs. 2, 4, 463, 22, 145, 179, 208, 235, 335, 528, 379, 567, 568, 578

SPECIAL ACTS

Most of these authorize the drainage of lands therein described or the lowering of certain lakes for drainage purposes, while some make small appropriations to aid in the drainage of certain property specified in the statute.

Special Laws, 1875, chs. 152, 157, 159
Special Laws, 1876, chs. 190, 192, 193, 194, 195
Special Laws, 1877, chs. 127, 246
Special Laws, 1879, ch. 187
Special Laws, 1883, chs. 257, 267, 268, 309
Special Laws, 1885, chs. 69 (at page 231), 192, 193, 216
Special Laws, 1887, chs. 222, 241, 357
Special Laws, 1889, chs. 358, 389, 320, 127, 540, 300, 124, 557, 98
General Laws, 1891, chs. 60, 162 (at page 319), 408, 482
Laws, 1893, ch. 241 (at page 396)
Laws, 1895, ch. 403 (at page 807)
Laws, 1897, chs. 103 (at pages 171, 176, 139, 187), 155

APPENDIX III

Drainage Cases in the Minnesota Supreme Court

Anderson *v.* Meeker County.....46 Minnesota, 237
Billsborrow *v.* Pierce.....101 Minnesota, 271
Billsborrow *v.* Pierce.....112 Minnesota, 336
Bowler *v.* Renville County.....105 Minnesota, 26
Clay County *v.* Olson.....123 Minnesota, 437
Cunningham *v.* Big Stone County.....122 Minnesota, 392
Curran *v.* Sibley County.....47 Minnesota, 313
Dalberg *v.* Lundgren.....118 Minnesota, 219
Dodge *v.* Martin County.....119 Minnesota, 392
Dresser *v.* Nicollet County.....76 Minnesota, 290
Fairmont Cement Stone Manufacturing Company *v.* Davidson.....122 Minnesota, 504
Gaare *v.* Clay County.....90 Minnesota, 530
Geib *v.* Morrison County.....119 Minnesota, 261
Gourd *v.* Morrison County.....118 Minnesota, 294
Heinz *v.* Buckham.....104 Minnesota, 389
Jacobson *v.* Lac qui Parle County.....119 Minnesota, 14
Johnson *v.* Morrison County.....107 Minnesota, 87
Jurries *v.* Virgens.....104 Minnesota, 71
Kelling *v.* Edwards.....116 Minnesota, 484
Kipp *v.* Dawson.....31 Minnesota, 373
Lager *v.* Sibley County.....100 Minnesota, 85
Lien *v.* Norman County.....80 Minnesota, 59
Lindbergh *v.* Morrison County.....116 Minnesota, 504
Lyon County *v.* Lien.....105 Minnesota, 55
McMullen *v.* Freeborn County.....93 Minnesota, 16
Madsen *v.* Larson.....117 Minnesota, 369
Meeker County *v.* Schultz.....110 Minnesota, 405
Meiz *v.* Wright County.....114 Minnesota, 448
Miller *v.* Jensen.....102 Minnesota, 391
Minnesota Canal and Power Company *v.* Koochiching County.....97 Minnesota, 429
Moody *v.* Brasie.....104 Minnesota, 463
Mulgrew Boyce Company *v.* Freeborn County.....112 Minnesota, 5
Prahl *v.* Brown County.....104 Minnesota, 227
Rasmussen *v.* Town of Hutchinson.....111 Minnesota, 457
Schumacher *v.* Wright County.....97 Minnesota, 74
Slingerland *v.* Conn.....113 Minnesota, 214
State *v.* Johnson.....111 Minnesota, 255
State *v.* Lindberg.....120 Minnesota, 147
State *v.* Lindig.....96 Minnesota, 419
State *v.* McGuire.....109 Minnesota, 88
State *v.* McGuire.....114 Minnesota, 281
State *v.* Tuck.....112 Minnesota, 493
State ex rel. Arpin *v.* George.....123 Minnesota, 59
State ex rel. Hadler *v.* District Court.....114 Minnesota, 424
State ex rel. Haney *v.* Clark.....112 Minnesota, 516
State ex rel. Hassing *v.* Quinn.....108 Minnesota, 528
State ex rel. Johnson *v.* Crosby.....92 Minnesota, 176
State ex rel. Kenny *v.* Nelson.....116 Minnesota, 424
State ex rel. Pederson *v.* Watts.....116 Minnesota, 326
State ex rel. Ross *v.* Posz.....106 Minnesota, 197
State ex rel. Schafer *v.* Buckham.....108 Minnesota, 8
State ex rel. Schubert *v.* Town of Rockford.....102 Minnesota, 442

APPENDIX IV

Drainage Work in Minnesota

TABLE A

Original Area of Swamp, Wet, and Overflowed Lands in Minnesota Counties

County	Acres	County	Acres
Aitkin	529,880	Mahnomen	50,000
Anoka	50,000	Marshall	258,240
Becker	50,000	Martin	45,180
Beltrami	1,451,520	Meeker	27,120
Brown	77,480	Mille Lacs	34,000
Carlton	70,000	Morrison	20,000
Cass	316,240	Mower	20,000
Chippewa	20,900	Murray	55,296
Chisago	15,000	Nobles	12,000
Clearwater	72,000	Norman	50,000
Clay	230,000	Otter Tail	162,000
Cook	102,159	Pine	293,000
Cottonwood	19,000	Polk	174,000
Crow Wing	127,000	Red Lake	202,175
Dakota	12,300	Redwood	120,000
Faribault	28,000	Renville	120,000
Fillmore	23,000	Roseau	533,680
Freeborn	154,000	St. Louis	1,392,160
Grant	33,000	Sibley	36,300
Hubbard	77,000	Stearns	40,000
Isanti	20,000	Steele	16,000
Itasca	590,600	Stevens	44,960
Kanabec	42,000	Swift	57,000
Kandiyohi	80,120	Todd	45,000
Kittson	184,000	Traverse	42,000
Koochiching	1,000,000	Wadena	80,000
Lac qui Parle	51,000	Waseca	27,016
Lake	798,600	Washington	15,360
Le Sueur	12,000	Wilkin	50,000
Lincoln	12,000	Yellow Medicine	51,000
Lyon	18,000		

[1] These estimates are contained in 1913 report of state drainage commission, and were prepared from personal surveys and examinations, official records, estimates of county officials and other sources. The following counties, because of the small amount of swamp lands within their borders or the absence of any, have been omitted from the table:

County	Acres	County	Acres
Benton	10,000	Pope	3,500
Bigstone	3,100	Ramsey	.....
Blue Earth	4,000	Rice	5,300
Carver	2,200	Rock	900
Dodge	1,000	Scott	860
Douglas	7,974	Sherburne	10,000
Goodhue	4,400	Wabasha	10,240
Hennepin	.....	Watonwan	6,000
Houston	2,200	Winona	9,600
Jackson	4,000	Wright	3,000
McLeod	9,000	Area of Minnesota	53,943,379
Nicollet	5,500	Land surface	50,355,379
Olmsted	.....	Lake surface	3,943,379
Pipestone	.....	Swamp land area	10,112,720

TABLE B

Area Drained by County and Judicial Ditches

Counties are listed in order as to amounts drained. Estimates are from 1913 report of State Commission

County	No. of Acres	County	No. of Acres
1. Marshall	1,349,064	38. Crow Wing	15,307
2. Polk	997,341	39. Murray	14,000
3. Beltrami	370,039	40. Dodge	13,853
4. Pennington	284,945	41. Faribault	12,337
5. Clay	284,717	42. Meeker	12,310
6. Kittson	268,618	43. Waseca	12,295
7. Red Lake	241,568	44. Big Stone	12.098
8. Aitkin	226,141	45. Isanti	11,094
9. Wilkin	198,193	46. Sherburne	11,081
10. Roseau	168,470	47. Blue Earth	10,659
11. Norman	164,463	48. Hennepin	10,419
12. Koochiching	127,749	49. Cass	10,000
13. Redwood	127,254	50. Steele	9,091
14. Traverse	89,090	51. Stevens	8,933
15. Anoka	58,041	52. Wright	7,848
16. Grant	53,621	53. McLeod	7,842
17. Otter Tail	49,000	54. Kanabec	7,471
18. Renville	48,618	55. Lyon	7,295
19. Pope	46,516	56. Lincoln	7,072
20. Kandiyohi	44,462	57. Wabasha	6,704
21, Todd	31,947	58. Mille Lacs	6,553
22. Yellow Medicine	31,276	59. Nobles	6,500
23. Freeborn	29,545	60. Washington	6,076
24. Wadena	28,383	61. Pine	4,886
25. Nicollet	24,216	62. Itasca	4,700
26. Martin	23,827	63. Carlton	4,666
27. Chippewa	23,247	64. Benton	4,196
28. Clearwater	23,219	65. Watonwan	4,062
29. Lac qui Parle	20,823	66. Becker	3,569
30. Le Sueur	20,000	67. Dakota	3,381
31, Stearns	19,861	68. Rice	2,727
32, Swift	19,420	69. Carver	2,403
33. Chisago	19,281	70. Hubbard	2,179
34. Brown	18,572	71. Cottonwood	2,088
35. Sibley	16,838	72. Ramsey	2,019
36. Jackson	15,515	73. Winona	1,487
37. Douglas	15,360	74. Scott	671
37. Douglas	15,360		

TABLE C

Average Price Per Yard Paid Contractors in Minnesota Counties

These figures are based upon the 1913 report of the State Drainage Commission

County	Cents	County	Cents
Aitkin	10.31	Blue Earth	17.23
Anoka	14.25	Brown	12.53
Becker	12.00	Carlton	15.55
Beltrami	14.00	Carver	11.20
Benton	15.10	Cass	11.00
Big Stone	16.71	Chippewa	11.00

County	Cents	County	Cents
Chisago	15.36	Nobles	12.00
Clay	12.90	Norman	14.00
Clearwater	15.98	Otter Tail	14.00
Cottonwood	16.00	Pennington	12.66
Crow Wing	15.00	Pine	14.00
Dakota	12.59	Polk	13.18
Dodge	9.00	Pope	11.70
Douglas	12.40	Ramsey	17.00
Faribault	9.00	Red Lake	10.50
Freeborn	9.07	Redwood	9.60
Grant	10.34	Renville	11.00
Hennepin	19.87	Rice	12.00
Hubbard	12.76	Roseau	13.63
Isanti	11.91	Scott	12.00
Itasca	22.00	Sherburne	13.00
Jackson	11.00	Sibley	10.00*
Kanabec	16.20	Stearns	15.00
Kandiyohi	10.05	Steele	8.00
Kittson	12.60	Stevens	12.64
Koochiching	25.00	Swift	11.00
Lac qui Parle	13.50	Todd	15.00
Le Sueur	15.00	Traverse	9.50
Lincoln	14.00	Wabasha	10.50
Lyon	16.00	Wadena	12.30
McLeod	10.00	Waseca	8.00
Marshall	11.70	Washington	10.40
Martin	12.00	Watonwan	12.00
Meeker	17.00	Wilkin	13.00
Mille Lacs	15.50	Winona	12.00
Murray	12.00	Wright	14.00
Nicollet	11.00	Yellow Medicine	14.50

In considering this table as well as others relating to the cost of work done, it should be remembered that in some counties the engineering work is much more simple than in others, the land with such a slope as to be easier drained than in some other counties, or the projects larger, and therefore contractors lower in their prices on account of the size of the jobs let.

TABLE D

Average Drainage Cost Per Acre of Land Benefited by County and Judicial Drains

The counties in the following list are arranged according to the cost of work done, beginning with the lowest. The figures are taken from the 1913 report of State Drainage Commission

1.	Traverse	$0.64	13.	Grant	1.45
2.	Polk	.81	14.	Beltrami	1.85
3.	Koochiching	1.09	15.	Hubbard	2.00
4.	Marshall	1.10	16.	Aitkin	2.08
5.	Norman	1.10	17.	Wabasha	2.20
6.	Pennington	1.15	18.	Cass	2.50
7.	Red Lake	1.17	19.	Watonwan	2.60
8.	Kittson	1.20	20.	Pine	2.60
9.	Clay	1.25	21.	Anoka	2.65
10.	Itasca	1.26	22.	Carlton	2.89
11.	Roseau	1.31	23.	Winona	3.00
12.	Wilkin	1.40	24.	Yellow Medicine	3.00

*Report of state drainage commission for 1913, upon which this chart is based, gives Sibley county at .10c. This is evidently a clerical error.

25.	Becker	3.00	50.	Blue Earth	6.84
26.	Kanabec	3.00	51.	Stearns	7.40
27.	Pope	3.00	52.	Benton	7.50
28.	Redwood	3.25	53.	Meeker	7.52
29.	Wadena	3.30	54.	Stevens	7.98
30.	Swift	3.31	55.	Kandiyohi	8.25
31.	Todd	3.80	56.	Wright	8.78
32.	Otter Tail	3.80	57.	Nobles	9.50
33.	Chisago	3.87	58.	Faribault	9.83
34.	Crow Wing	3.90	59.	Freeborn	9.86
35.	Dodge	4.00	60.	Big Stone	9.91
36.	Washington	4.10	61.	Lyon	10.00
37.	Sherburne	4.90	62.	Scott	10.00
38.	Mille Lacs	5.00	63.	Hennepin	10.51
39.	Nicollet	5.60	64.	Chippewa	10.86
40.	Isanti	5.68	65.	Le Sueur	11.00
41.	Murray	5.70	66.	Carver	11.00
42.	Douglas	5.90	67.	McLeod	11.00
43.	Renville	6.40	68.	Ramsey	12.00
44.	Steele	6.40	69.	Martin	13.00
45.	Rice	6.45	70.	Lac qui Parle	13.75
46.	Clearwater	6.67	71.	Jackson	14.00
47.	Sibley	6.75	72.	Brown	14.80
48.	Waseca	6.80	73.	Cottonwood	15.30
49.	Dakota	6.80	74.	Lincoln	16.00

TABLE E

Total Cost of County and Judicial Ditches in Minnesota Counties

The counties are listed in accordance with the amount spent by each. The figures are taken from 1913 report of the State Drainage Commission

1.	Marshall	$1,496,302	30.	Big Stone	120,772
2.	Polk	816,035	31.	Lincoln	116,776
3.	Beltrami	685,235	32.	Sibley	114,938
4.	Aitkin	470,620	33.	Hennepin	109,600
5.	Redwood	417,000	34.	Watonwan	106,269
6.	Jackson	398,195	35.	Wadena	93,725
7.	Kandiyohi	366,531	36.	Meeker	92,551
8.	Freeborn	335,221	37.	Douglas	90,511
9.	Pennington	330,022	38.	Waseca	81,955
10.	Clay	328,224	39.	Murray	80,386
11.	Martin	327,519	40.	Grant	77,432
12.	Lac qui Parle	315,331	41.	Chisago	74,676
13.	Renville	311,109	42.	Lyon	74,177
14.	Kittson	296,290	43.	Blue Earth	72,968
15.	Red Lake	276,731	44.	Stevens	71,296
16.	Brown	274,956	45.	Yellow Medicine	71,238
17.	Wilkin	265,690	46.	McLeod	69,115
18.	Chippewa	252,777	47.	Wright	68,913
19.	Roseau	221,344	48.	Swift	64,283
20.	Le Sueur	210,450	49.	Isanti	63,010
21.	Otter Tail	182,000	50.	Nobles	61,894
22.	Norman	172,053	51.	Crow Wing	59,927
23.	Anoka	154,190	52.	Steele	58,525
24.	Stearns	148,615	53.	Traverse	57,180
25.	Koochiching	139,757	54.	Dodge	55,235
26.	Pope	139,422	55.	Sherburne	54,315
27.	Nicollet	136,167	56.	Mille Lacs	32,780
28.	Todd	124,807	57.	Cottonwood	32,098
29.	Faribault	121,349	58.	Benton	31,506

59. Carver	26,904	67. Clearwater	15,500
60. Washington	25,033	68. Wabasha	14,694
61. Ramsey	24,994	69. Carlton	13,488
62. Cass	24,737	70. Pine	12,858
63. Dakota	23,060	71. Scott	6,270
64. Kanabec	22,201	72. Itasca	5,822
65. Rice	17,966	73. Winona	4,480
66. Becker	16,267	74. Hubbard	4,375

TABLE F

Total Number of Acres Benefited in Minnesota by State Ditches

Counties are listed in order as to amounts drained in each. Figures are from 1913 report of State Rrainage Commission

County	Acreage	Cost
1. Roseau	487,036	$564,727
2. Marshall	153,268	140,326
3. Kittson	143,619	158,590
4. Aitkin	142,257	137,607
5. Polk	70,787	72,056
6. St. Louis	54,300	53,885
7. Koochiching	51,200	52,415
8. Norman	29,000	32,018
9. Itasca	21,000	24,343
10, Clay	20,000	24,854
11. Traverse	17,000	19,563
12. Wilkin	15,500	19,241
13. Beltrami	5,500	7,619
14. Otter Tail	3,800	4,757
15. Hubbard	3,670	9,733
16. Red Lake	2,500	3,188
17. Wadena	1,600	1,846
18. Clearwater	1,000	2,199
19. Becker	600	878

TABLE G

Average Net Profit Per Acre on Lands Drained by County and Judicial Ditches in Minnesota

That is, differences between average per acre cost of drainage and average per acre benefits assessed. Based on figures in 1913 report of the State Drainage Commission.

1. Faribault	$14.26	16. Wright	8.49
2. Freeborn	13.20	17. Lincoln	8.23
3. Stevens	12.77	18. Lyon	7.75
4. Swift	11.98	19. McLeod	7.33
5. Dakota	11.61	20. Meeker	7.29
6. Winona	11.34	21. Stearns	6.94
7. Carver	10.84	22. Hubbard	6.82
8. Nobles	10.16	23. Nicollet	6.78
9. Hennepin	10.06	24. Lac qui Parle	6.70
10. Waseca	9.92	25. Scott	6.21
11. Sibley	9.65	26. Pine	5.60
12. Steele	9.13	27. Blue Earth	5.12
13. Benton	8.84	28. Jackson	4.01
14. Renville	8.83	29. Rice	3.62
15. Cottonwood	8.73	30. Watonwan	3.46

31. Todd	3.40	51. Brown	1.35
32. Pope	3.25	52. Roseau	1.35
33. Sherburne	3.17	53. Kittson	1.03
34. Becker	3.02	54. Pennington	1.03
35. Chippewa	2.80	55. Crow Wing	.93
36. Redwood	2.74	56. Marshall	.79
37. Big Stone	2.55	57. Polk	.65
38. Aitkin	2.50	58. Cass	.59
39. Otter Tail	2.36	59. Itasca	.54
40. Kandiyohi	2.27	60. Martin	.32
41. Grant	2.19	61. Yellow Medicine	.10
42. Murray	2.18	62. Ramsey	.07
43. Koochiching	2.11	63. Washington	.01
44. Chisago	2.06	64. Wadena	.00
45. Wilkin	1.81	65. Douglas	.01*
46. Kanabec	1.66	66. Wabasha	.01*
47. Traverse	1.62	67. Carlton	.10*
48. Anoka	1.61	68. Mille Lacs	.11*
49. Isanti	1.52	69. Dodge	.25*
50. Beltrami	1.41	70. LeSueur	2.45*

*Loss.

APPENDIX 5

AUTHORITIES

A. OUTLINE OF SOURCES

I PRIMARY

1 Statutes of the United States and of the states
2 State constitutions
3 Decisions of federal and state courts
4 Federal government publications
  a Reports of commissioner of general land office
  b Bulletins of department of agriculture
  c Bureau of experiment stations publications
  d The Congressional Record
  e House and Senate reports and documents
  f Geological Survey reports
5 State government publications
  a Reports of state boards
  b Reports of Wisconsin legislative committee on forestry, water power and drainage
  c Reports of state treasurers and state auditors of Minnesota
  d Messages of governors of Minnesota
  e Opinions of attorneys general of Minnesota

II SECONDARY

1 Books
2 Magazines
3 Miscellaneous
  a Drainage convention proceedings and addresses
    (a) National
    (b) North Carolina
    (c) Southern Commercial Congress
  b Personal letters (approximately 150)
  c Newspapers
  d Newspaper article of George A. Ralph, former Minnesota state drainage engineer

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APPENDIX 6

Table of Cases

INDEX

Note—The Table of Contents also furnishes a guide to all important topics. State statutes are outlined in appendix 1.