64TH CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. } DOCUMENT No. 931.

KANKAKEE RIVER, ILL. AND IND.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORT ON PRELIMINARY EXAMINATION OF KANKAKEE RIVER, ILL. AND IND., WITH A VIEW TO DEVISING PLANS FOR FLOOD PROTECTION AND DETERMINING THE EXTENT TO WHICH THE UNITED STATES SHOULD COOPERATE WITH THE STATES AND OTHER COMMUNITIES AND INTERESTS IN CARRYING OUT SUCH PLANS, ITS SHARE BEING BASED UPON THE VALUE OF PROTECTION TO NAVIGATION.

MARCH 21, 1916.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustration.

WAR DEPARTMENT,
Washington, March 20, 1916.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Acting Chief of Engineers, United States Army, of this date, together with copy of a report from Lieut. Col. W. V. Judson, Corps of Engineers, dated November 4, 1915, with map, on preliminary examination of Kankakee River, Ill. and Ind., made by him in compliance with the provisions of the river and harbor act approved March 4, 1915.

Very respectfully,

H. L. SCOTT,
Major General, Chief of Staff,
Acting Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 20, 1916.

From: The Chief of Engineers, United States Army.
To: The Secretary of War.
Subject: Preliminary examination of Kankakee River, Ill. and Ind.

1. There is submitted herewith, for transmission to Congress, report dated November 4, 1915, with map, by Lieut. Col. W. V. Judson, Corps of Engineers, on preliminary examination authorized by the river and harbor act approved March 4, 1915, of Kankakee River, Ill. and Ind., "with a view to devising plans for flood protection and determining the extent to which the United States should cooperate with the States and other communities and interests in carrying out such plans, its share being based upon the value of protection to navigation."

2. The Kankakee River rises in Indiana, and joins with the Des Plaines River in Illinois to form the Illinois River. It has a length of about 130 miles, and drains an area of approximately 5,000 square miles. There are no urban communities upon the banks of the Kankakee which suffer from floods. The most serious effect of floods occurs in the vicinity of the mouth of the Yellow River in the section known as English Lake. This section is extremely flat for many miles on each side of the river and in high-water periods is covered to a depth of 4 or 5 feet. The area flooded in the May, 1914, flood is stated to have been about 6,000 acres on the east side of the Kankakee and about 15,000 acres on the west side. The flood problem relates primarily to the reclamation of marshlands for agricultural purposes. At Momence, Ill., about 7 miles west of the Indiana State line, a limestone ledge outcrops in the river for a distance of about 2½ miles, and it is claimed that this ledge is an important obstruction to effective drainage of the lands above. Some work has been done at this locality by the State of Indiana, and a large amount of work has been done in the upper river by the State and private enterprise, in the interests of drainage and reclamation. The stream is not navigable in its present condition, and to make it so would require very large expenditures. The general desire of those interested appears to be for the control of the stream for land-reclamation purposes, and there is but little interest in the question of navigation. The district officer outlines general plans for the proposed flood protection, and he reports that the value to navigation of the protection desired would be negative, and he is of opinion that the United States should not cooperate in carrying out any plans for the improvement of this river. The division engineer concurs in this opinion. The cost of fully developing the plans which are outlined, including the necessary detailed surveys, would be approximately $25,000.

3. This report has been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated February 9, 1916, concurring in the views of the district officer and division engineer.

4. After due consideration of the above-mentioned reports, I concur in the views of the district officer, the division engineer, and the Board of Engineers for Rivers and Harbors, and therefore report that the improvement by the United States of Kankakee River, Ill. and

Ind., with a view to flood protection in cooperation with the States and other communities and interests, is not deemed advisable, based upon the value of such protection to navigation.

W. M. BLACK,
Colonel, Corps of Engineers,
Acting Chief of Engineers, United States Army.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
February 9, 1916.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The following is in review of the district officer's report authorized by the river and harbor act of March 4, 1915, on preliminary examination of " * * * Kankakee River, * * * Illinois and Indiana, with a view to devising plans for flood protection and determining the extent to which the United States should cooperate with the States and other communities and interests in carrying out such plans, its share being based upon the value of protection to navigation."

2. The Kankakee River rises in the northwestern part of the State of Indiana, and flows in a generally western direction to its junction with the Des Plaines River in the State of Illinois. Its length is 130 miles and it drains an area of about 5,000 square miles. At Momence, Ill., about 7 miles west of the Indiana State line, a limestone ledge outcrops in the river for a distance of about 2½ miles, and marks the division between the upper and lower sections which have different natural characteristics. Below Momence the river has well-defined banks and sufficient slope to carry the run-off; above Momence the watershed is flat, having an area of about 2,300 square miles, of which about 625 square miles were originally marsh and subject to annual overflow. It has long been claimed that the rock ledge at Momence is an important obstruction to effective drainage of the lands above this point, and its removal by the United States has been considered several times, as stated by the district officer, the conclusions always being adverse on the ground that the work was not warranted in the interests of navigation. . It was questioned, moreover, whether the expected benefits would result from the removal.

3. The drainage problems of the low lands along the river in Indiana were investigated by the United States Department of Agriculture, and the results, with suggested plans of improvement, were published in 1909 in Circular No. 80, Office of Experiment Stations, under the title: "A Report upon the Drainage of Agricultural Lands in the Kankakee River Valley, Indiana."

4. The lower river was improved by a navigation and manufacturing company under a State law of 1847, at a cost of about $350,000. Three locks and dams were constructed by this company and one by the State of Illinois, and apparently some commerce developed, but it is stated in a report of 1884 that the commerce had ceased. Since that time the works of improvement have practically disappeared and

there is no commercial navigation on the river. Canalization of the river below Momence would be necessary in order to afford navigation up to that place.

5. In 1889 and 1891 the State of Indiana made two appropriations aggregating $65,000, which were expended in cutting a channel 8,649 feet long, 300 feet wide, and 2½ feet deep through the main ledge at Momence. This did not include a bowlder bar at its upper end, called the "Riffles," but a contract has recently been let for the removal of this obstruction. A large amount of work has also been done by the State of Indiana, by private parties, and by reclamation companies in the upper river in the interests of drainage, reclamation, and prevention of overflow, and a number of projects are now under way or being discussed. The cost of the work done is stated to be about $350,000, and the estimated cost of the work under way or contemplated is about $972,000. The improvement consists of widening and straightening the river, building levees, drainage ditches, and similar works. These works have been designed and carried on without a general and comprehensive plan, and while about one-third of the total area of 400,000 acres has been reclaimed, the results have apparently not been as complete as the expenditures would seem to warrant.

6. The district officer states that while no general plan for reclamation can be made without a detailed survey, which would involve great cost, it is probable that such plan would involve a deepening, straightening, and widening of the river and the construction of levees with provision for pumping plants. A general desire of the community appears to be for the control of the stream for land reclamation purposes, and there is but little interest in the question of navigation. The district officer reports that the value to navigation of the protection desired would be negative, and that the United States should not cooperate in carrying out any plans for the improvement of Kankakee River. The division engineer concurs in this view.

7. Parties in interest were informed of the unfavorable tenor of the district officer's report and given an opportunity of submitting their views to the board. Several communications have been received and given consideration. The main argument submitted in favor of further procedure on the part of the United States relates to removal of the rock ledge at Momence and is based on the interstate relations involved, since the work proposed is in Illinois and the lands to be benefited are in Indiana. As already indicated, however, this work is not warranted in the interests of navigation.

8. The investigations of the district officer lead to the conclusion that the improvement desired is essentially one of flood control and reclamation. The stream is not navigable in its present condition and to make it so would require very large expenditures for slackwater structures, at least in its lower reaches, and for the straightening, widening, and deepening of the greater part of its length and the complete readjustment of a large number of bridges that have been constructed without regard to navigation. The amount of commerce to be expected from such an improvement is comparatively small, certainly not sufficient to justify any considerable expenditure on the part of the Federal Government. It may be stated that while the influence of the plans for flood protection upon the navigation of other streams below would not be very material it would be delete-

rious rather than helpful, as an effective improvement for drainage means quick run-off, the reverse of what is desired in aid of low-water navigation.

9. In view of the foregoing and of the legal limitation of Federal interest to the "value of protection to navigation," the board concurs in the opinion of the district officer and the division engineer that it is not advisable for the United States to cooperate in the work of flood protection of the Kankakee River, Ill., and Ind., as such work has no material value for protection to navigation.

10. In compliance with law the board reports that there are no questions of terminal facilities, water power, or other related subjects which could be coordinated with the suggested improvement in such manner as to render the work advisable in the interests of commerce and navigation.

For the board:

W. M. BLACK,
Colonel, Corps of Engineers,
Senior Member of the Board.

PRELIMINARY EXAMINATION OF KANKAKEE RIVER, ILL. AND IND.

UNITED STATES ENGINEER OFFICE,
Chicago, Ill., November 4, 1915.

From: The District Engineer Officer.
To: The Chief of Engineers, United States Army
(Through the Division Engineer).
Subject: Preliminary examination of the Kankakee River, Ill. and Ind.

1. In compliance with department letter of April 16, 1915, I submit herewith report, with map, on a preliminary examination of the Kankakee River, Ill. and Ind., provision for which is contained in the river and harbor act of March 4, 1915, as follows:

Kankakee River, Illinois and Indiana, with a view to devising plans for flood protection and determining the extent to which the United States should cooperate with the States and other communities and interests in carrying out such plans, its share being based upon the value of protection to navigation.

DESCRIPTION OF RIVER AND WATERSHED.

2. The Kankakee River rises in the State of Indiana near the city of South Bend and flows in a southwesterly direction through Indiana and Illinois to the mouth of its tributary, the Iroquois River, and thence in a northwesterly direction to the Des Plaines River, with which it unites to form the Illinois River, a tributary of the Mississippi. The length of the river in a general course from its source to its mouth is about 130 miles. It drains an area of approximately 5,000 square miles, of which about 3,000 lie in Indiana. The principal tributaries are the Yellow River, joining the Kankakee River about 7 miles west of Knox, Ind., and draining about 650 square miles; and the Iroquois River, joining near Waldron, in Kankakee County, Ill., and draining about 2,000 square miles, part of which lies in Indiana. Other tributaries drain areas of less than 100 square miles each and are relatively unimportant.

3. At Momence, about 7 miles west of the Indiana State line, an outcrop of the limestone ledge which traverses eastern Illinois and western Indiana is found in the river for a distance of about 2½ miles Below Momence the formation of the river valley is normal, with a comparatively small area of bottom lands. The river here has well-defined banks and a slope ample to carry the run-off. Above Momence the watershed of the Kankakee proper is a comparatively flat plain largely devoid of timber and having an area of approximately 2,300 square miles, about 625 square miles of which was originally marsh or subject to annual overflow. From its upper end near South Bend, Ind., to Momence, Ill., about 82 miles, this watershed has an average slope of 1.24 feet per mile and a mean elevation of about 90 feet above Lake Michigan.

4. The soil generally consists of a dark sandy loam varying in thickness from 1 to 5 feet, overlying fine sand, which changes farther down to coarse sand and gravel with an occasional thin layer of clay. The entire basin is devoid of rock with the exception of the ledge at Momence and a few scattered bowlders.

5. The upper Kankakee River in its original condition was extremely sinuous, having a developed length from its source to Momence of about 250 miles in an actual distance of 82 miles, and an average slope of approximately 0.45 foot per mile. Above its junction with the Yellow River the stream flowed through the marsh with no well-defined banks, while from the junction to Momence the banks, although somewhat defined, were low and the adjacent lands subject to overflow during high-water periods.

6. From Momence to its mouth the river has a developed length of about 64 miles in a distance of about 47 miles. The total fall is approximately 131 feet, corresponding to 2 feet per mile along the river, or 2.8 feet per mile in its general course. This fall is not uniformly distributed but occurs mostly below the mouth of the Iroquois, from which point downward the fall is approximately 103 feet in 33 miles, or about 3 feet per mile. The banks are well defined, varying in height from 15 to 35 feet above low water and confine the river to its bed at all stages.

RAINFALL.

7. The following statement of rainfall and climatic conditions prevailing in the Kankakee Valley is given by the United States Department of Agriculture in circular No. 80, Office of Experiment Stations:

The normal annual rainfall is 34.5 inches, but ranges between 31 and 48 inches. The monthly maximum of rainfall reached 7 inches in May, 1902, and 8.6 inches in the following month, but the normal for each of these two months is about 3 inches. The maximum for 24 hours, as shown by the reports, is 2.15 inches, and for 48 hours 3.7 inches. The lack of distributed rainfall so common in the Mississippi Valley prevails here. A peculiarity not noted elsewhere is the variation of the precipitation in different parts of the valley for the same week or month. For instance, the rainfall for June 1902, was 8.68 inches at Laporte, 7.29 inches at Hammond, and 13.9 inches at Rensselaer, the last being phenomenal. The precipitation for May, 1905, at Rensselaer was 7.93 inches, at Hammond 4.79 inches, at Valparaiso 6.72 inches, and at South Bend 6.46 inches. The maximum rainfall occurs in May and June, at which season the soil is in a receptive condition. The maximum run-off, however, may occur during the late winter or early spring months, when rains and the melting of accumulated snow occur at a time when the ground will absorb but little water. In general the climatic conditions are not far different from those prevailing in other parts of the central Mississippi Valley.

RUN-OFF.

8. Data regarding the run-off from various sections of the valley are rather limited.

9. In December, 1871, Father Stephan, chief engineer of the Kankakee Valley Drainage Co., made two gaugings at a normal stage of the river, one at the State line and the other 1 mile above Momence, with the following results:

	Second-feet.
State line	1,271
1 mile above Momence	1,452

10. The United States Geological Survey in the spring and summer of 1905 established gauging stations on the Kankakee River at Davis, Ind., at the Pennsylvania Railway bridge; at Momence, about one-half mile below the Chicago & Eastern Illinois Railway bridge; and on the Yellow River at Knox. These stations were abandoned in July, 1906. The maximum discharges recorded during this period were 1,140 second-feet at Davis, 6,960 second-feet at Momence, and 1,350 second-feet at Knox.

11. In 1914 gaugings made by the United States Engineer Department, in connection with a survey for a proposed Lake Erie-Lake Michigan Canal gave a flood discharge of 8,000 second-feet for the Kankakee River at a point about 3 miles above the mouth of the Yellow River, at the Nickel Plate Railway bridge. Private engineers engaged in drainage work in the vicinity also obtained a flood discharge at the same point on the Kankakee of 8,000 second-feet and for the Yellow River, at Knox, of 6,400 second-feet.

12. The gauging station at Momence was reestablished in the fall of 1914 by the United States Geological Survey. The greatest discharge measured since the reestablishment of this station is stated to be 7,000 second-feet, which was obtained July 11, 1915.

13. Mr. J. L. Clark, a civil engineer, residing at Momence, states that the extreme flood noted at that locality occurred in 1869, and that measurements taken by him at the time indicated a discharge of from 26,000 to 30,000 cubic feet per second.

14. With the exception of the statement of Mr. Clark, measurements made by the United States Geological Survey are the only records available of the flood discharge at Momence. No records are available of any simultaneous gaugings of the Kankakee at Momence and near the mouth of the Yellow River during any one flood period. It is very probable, however, that the normal flood discharge at Momence in the unimproved condition of the river was approximately 7,000 second-feet, equivalent to a run-off for the basin above Momence of about 3.3 second-feet per square mile, or one-eighth inch in 24 hours.

15. Since the improvement of the channel in the upper reaches of the river, it is very probable that the flood discharge at Momence has been increased, and it is reasonable to suppose that it is now much in excess of the 7,000 second-feet previously reported, though no variation in flood heights have been noted by casual observers at Momence.

16. The gaugings referred to above indicate a flood discharge of the Kankakee, immediately below the mouth of the Yellow, of at

least 14,000 second-feet, about twice the former discharge at Momence. This discharge is equivalent to a run-off from the watershed, above the mouth of the Yellow, of about 13 second-feet per square mile of area, or about one-half inch in 24 hours. As will be shown later, a considerable proportion of this discharge is retained in English Lake, lying immediately below the mouth of the Yellow River, and serves to maintain the ordinary flow of the lower end of the Kankakee River near Momence during lower water periods.

17. Mr. Isham Randolph, consulting engineer, in discussing plans for flood protection in the vicinity of Knox, Ind., on both the Yellow and the Kankakee, expresses the opinion that a run-off of 20 second-feet per square mile should be used in determining the flood flow and has designed works accordingly. On this basis the discharge of the Kankakee, below the mouth of the Yellow, would be about 20,000 second-feet.

18. Numerous formulæ have been devised for computing the probable flood discharge from any given area, the formulæ being based upon the size of the catchment area and a constant depending upon the rainfall, storage area, slope, and other conditions affecting the run-off. These formulæ can not be usefully applied to the Kankakee owing to a lack of data necessary for obtaining the value of the constant.

19. Mr. Weston E. Fuller, in an article entitled: "Flood flows," published in the Transactions of the American Society of Civil Engineers, 1914, gives the following formulæ:

(1) Average yearly flood (flow for period of 24 hours) . . . $Q=CA^{0.8}$
(2) Larger flood (greatest average rate of flow for 24 hours during a period of years) . . . $Q=CA^{0.8}(1+0.8 \log. T)$
(3) Probable maximum flood (probable flow occurring greater than average) . . .

$$Q=CA^{0.8}(1+0.8 \log. T)\left(1+\frac{2}{A^{0.3}}\right)$$

Q=discharge in cubic feet per second.
T=length of period in years.
C=coefficient which is constant for river at point of observation.
A=catchment area in square miles.

20. Considering the values of the coefficient, C, given for other rivers in the Mississippi River Basin, and considering also the slight slope of the stream and the reservoir action of the marshes, it is probable that a value of 15 would be applicable to the Kankakee River. Giving C this value and making T equal to 5 in number (2) and 100 in number (3), the discharge at Momence would be as follows:

(1) Q=7,440 cubic feet per second, annual flood.
(2) Q=11,600 cubic feet per second, flood to be expected once in five years.
(3) Q=23,125 cubic feet per second, maximum flood to be expected in 100 years.

21. The results given by these formulæ compare very closely with the results of measurements, and it is probable that the maximum flood discharge to be expected at Momence is approximately 23,000 second-feet.

KANKAKEE MARSH.

22. The Kankakee marsh, referred to above, originally extended from the source of the Kankakee River near South Bend to Momence. It was generally untimbered except on a few scattered sand islands rising from 10 to 40 feet above the surrounding level. It had

a width varying from 1 to 20 miles, averaging about 10 miles, and an area of about 400,000 acres. The lands were covered with water during the greater portion of the year and were subject to overflow during all high-water periods. In its natural condition the marsh was covered with a luxuriant growth of prairie grass, wild rice, etc., which in connection with the absorptive properties of the soil retarded the run-off and prolonged the high-water periods, acting as a reservoir in which were impounded the waters of the entire drainage system above Momence. It has been stated that a heavy rain filling the marsh above Momence would keep up a good supply in the river below for six weeks, even in time of extreme drought.

SUMMARY OF PREVIOUS REPORTS.

23. Following is a brief summary of former official reports relating to the Kankakee River.

24. The first relatively exact data as to the Kankakee Valley were obtained in 1831 by Capt. Howard Stansbury incident to a survey of a proposed canal route between Lake Michigan and the Wabash River. This survey, which covered the country between South Bend and the Wabash River by way of the Yellow and Tippecanoe Rivers, gave the elevation of the divide at South Bend as 127 feet above Lake Michigan, which reduced to sea level, employing 581 as the elevation of Lake Michigan, gives the Kankakee-St. Joseph divide an elevation of 708 feet. (Report of Maj. G. L. Gillespie to Chief of Engineers, 1876, Part 2. p. 455).

25. In 1876 Maj. G. L. Gillespie, in a report of a preliminary examination for the canal proposed above, made the following statement:

> A great deal has been done already by private parties draining the Kankakee Valley, and the good results of such a work have been very apparent. Small lateral canals or ditches have been dug on both margins of the river, and sufficient falls have been gotten to create a perceptible flow of water, by which the area so covered has been freed from the surface water and the ground rendered useful for agricultural purposes * * * it is not denied that a drainage canal along the Kankakee Valley * * * would be a great benefit but it must be remembered * * * that all the water the Kankakee can supply is needed and must be applied in the Illinois River to maintain the depth of water sought to be obtained there by existing improvements * * * under construction * * * for increasing the navigation of that river in connection with the Illinois and Michigan Ship Canal. If the Kankakee Valley is to be drained, it should be a separate work * * *. A commercial canal * * * and a drainage canal of the Kankakee Valley are entirely distinct works and they can not be combined in one canal without damaging the interests that may be attained by each, taken as a separate work. (Report of Chief of Engineers, 1876, part 2, pp. 460–463.)

26. In 1879, Maj. Jared A. Smith, in a report on the proposed improvement of the Kankakee River stated that improvements already made by private parties on the lower river had unquestionably been of great benefit to the adjacent sections in reducing freight rates and that the completion of improvements to render the river navigable up to Momence would effect a further saving. In regard to the removal of the rock section at Momence he states:

> The rocky bed of the river at and near Momence has been considered a great obstacle to the drainage of the lands in Indiana. The fact that the fall above this place for several miles is considerably greater than the average, with a study of the general character of the river, leads me to believe that its removal would accomplish little or nothing for the drainage of lands so far above, * * *. (Report of Chief of Engineers, 1879, part 2, pages 1455–1457.)

In 1880 Maj. Smith reported surveys made and submitted an estimate of cost amounting to $550,000 for the improvement of the river from the then existing head of slack-water navigation, a short distance above Wilmington, up to Momence (about 35 miles) by means of locks and dams. He stated that the river above Momence was navigable for 100 miles or more without further improvement. (Report of Chief of Engineers, 1880, pt. 2, p. 1844.) Again, in 1882, Maj. Smith made a report of an examination of the stone formation in the Kankakee River at Momence. This examination was made with a view to the removal of the Momence ledge for the improvement of the river for navigation between Wilmington and Momence, and resulted in an adverse report on the ground that "the removal of a barrier 35 miles above the head of navigation can not improve or extend that navigation in any way, * * *." In the same report Maj. Smith states that the benefits which would be derived from the drainage of the swamp lands would be immense, but expresses a doubt as to whether the removal of the rock at Momence would aid in the drainage to any great extent. (Report of Chief of Engineers, 1884, pt. 3, pp. 1766–1768.)

27. The last report on the Kankakee River by the Engineer Department is that of Capt. James C. Post which again had reference to the removal of the rock at Momence. Capt. Post opposed the removal of the rock on the grounds "that the commerce on the river warranted no expenditure of Government funds." He concluded his report with the following: "If, however, agricultural development is to be taken into account, then it may be worthy of improvement." (Report of Chief of Engineers, 1885, pt. 2, pp. 1645–1647.)

28. The first record of the Kankakee is found in an account of an expedition organized by La Salle. In 1679, having proceeded up the St. Joseph River as far as South Bend, the expedition portaged across the divide and descended the Kankakee. Hennepin, a member of the expedition, made note of the Kankakee marshes.

29. In 1869–70, Father J. A. Stephan, at that time chief engineer of the Kankakee Valley Drainage Co., organized under laws passed by the general assembly of Indiana for the purpose of draining and reclaiming lands of the valley, traveled extensively through the Kankakee Valley making observations and acquiring a general knowledge of the characteristics of the stream from South Bend to the State line. In a letter to Maj. G. L. Gillespie (see Report of Chief of Engineers, 1876, pt. 2, p. 461) he said:

> I found the Kankakee River in its present state from the beginning in St. Joseph County to the Illinois State line with its meanderings, 242 miles in length, while the actual straight line is only 72 miles. The fall on straight line would average 13 inches per mile.

30. Prof. John L. Campbell in 1882 made a survey of the Kankakee Valley from its source in St. Joseph County to Momence, Ill., in accordance with an act of the Indiana Legislature directing him "to ascertain the cheapest and most practical outlets for the drainage of the wet and swamp lands of the Kankakee region." Prof. Campbell showed that it was quite possible to drain and reclaim the several hundred thousand acres of marsh land and suggested the following plan for accomplishing the purpose:

First, the construction of a better main channel than now exists for the flow of the river; second, the straightening and deepening of the beds of the streams emptying into the main stream; and third, the digging of a large number of lateral ditches through the swamps to the improved channels.

Prof. Campbell estimated the cost of the proposed improvement at about $650,000 and the resulting increased valuation of the entire valley at $10,000,000.

31. In 1889, Mr. Lyman E. Cooley, in an article entitled "The Illinois River Basin in its Relation to Sanitary Engineering," discusses the Kankakee watershed in regard to the geological formation of the valley, and the physical characteristics of the river in relation to stream flow, both at normal and flood stage.

32. In 1904 a preliminary examination of the drainage conditions of the valley of the Kankakee River was made by Prof. W. D. Pence, of Purdue University, for the Office of Experiment Stations of the Federal Department of Agriculture. This investigation showed that the activities of landowners in the upper valley in constructing drainage works were working hardship on those farther down, due to the increased rate of run-off from above.

33. In 1905, Mr. M. H. Downey was detailed by the Office of Experiment Stations to conduct further investigations "for the purpose of examining the peculiarities of this great valley, learning what had been accomplished by drainage and the bearing that varied operations and experience of landowners had upon the solution of the drainage question now arising in the lower half of the valley."

34. The results of the Pence and Downey investigations were published in 1909 by the Department of Agriculture in Circular 80, hereinbefore referred to, under the following title: "A report upon the drainage of agricultural lands in the Kankakee River Valley, Indiana." This report summarizes the work of the State of Indiana and of various counties and private corporations interested in the improvement and reclamation of the marsh lands. The report shows that in 1906 the channel had been straightened and deepened by the agencies mentioned above as far down as the west line of Laporte and Starke Counties and that the channel of the Yellow River had been straightened and improved to some extent. Three plans of further improvement were suggested as worthy of consideration:

First, the construction of levees on both sides of the present channel of sufficient strength and height to conduct the water from the upper part of the valley to the outlet point at Momence Rock without overflowing the adjoining land; second, the straightening of the present channel and the construction of levees on the side of the improved channel; third, the straightening and enlarging of the present channel from the junction of the Yellow River with the Kankakee River to Momence Rock to such an extent that it will carry the entire drainage of the lower valley without the assistance of levees.

The third plan was the one most favored on the ground that it was best adapted to accommodate the system of drains and ditches already constructed. The channel proposed had a width varying from 105 feet at its upper end to 230 feet at Momence, and a capacity at the latter point of about 7,400 second-feet. The estimated cost of the project was, in round figures, $1,000,000.

PAST IMPROVEMENTS FOR NAVIGATION PURPOSES.

35. Works of improvement for navigation have been confined to the lower river below Momence. A company, known as the "Kankakee & Iroquois Navigation & Manufacturing Co." was incorporated in 1847 under the laws of Illinois for the purpose of the "Improvement of the navigation of the Kankakee and Iroquois Rivers, the erection of water power on said streams, and the building and erecting mills and machinery of all kinds on and near said streams." This company, subsequently known as the "Kankakee Co.," was granted various rights and franchises by the State of Illinois. At a cost of about $350,000 three locks and dams were constructed by the company and one by the State of Illinois, resulting in an improvement of the river for a distance of about 33 miles from its mouth to Warners Landing, about 12 miles above Wilmington. One dam was of masonry and the other three presumably of timber, with masonry locks having lifts of 8 to 15 feet. The largest boats that could pass through the locks were 105 feet in length, 17.5 feet in width, and 4.5 feet draft. Before completion of its plans the funds of the company were exhausted and construction was stopped. At the time of Capt. Post's report in 1884 commerce on the river had practically ceased and the locks were in need of repairs. Since the time of the improvement made by the Kankakee Co. no work for navigation purposes has been done. At the present time the locks and dams constructed by the above-mentioned agencies have disappeared, with the exception of the walls of two locks, one about one-half mile above and the other about 3 miles below Wilmington.

36. There are no urban communities upon the banks of the Kankakee which suffer from floods. The flood problem relates to the reclamation of marsh lands for agricultural purposes.

IMPROVEMENTS FOR RECLAMATION PURPOSES.

37. During the past 30 years a large amount of work has been done throughout the valley in a partially successful effort to drain the marsh lands. Numerous drainage ditches of various sizes have been constructed, and the river has been straightened and deepened in its upper reaches.

38. As an aid to the drainage of the marsh lands, the State of Indiana in 1889 appropriated $40,000 for the enlargement of the channel through the rock at Momence. Later a further appropriation of $25,000 was made for the completion of the work. Under these appropriations a channel 8,649 feet long, 300 feet wide, and 2½ feet deep was cut through the main ledge, but did not include the entire rock section, a bowlder morain about 500 feet long and 300 feet wide, locally known as the Riffles, being left at the upper end. During low stages of the river practically no water passes over the Riffles, the only passageway being a small channel constructed near the south bank by local parties for the use of small pleasure boats.

39. In more recent years the Kankakee Improvement Co. and the Kankakee Reclamation Co., two private corporations, have been actively interested in the improvement of the river for drainage purposes, both operating in the upper portion. Likewise the county governments of the various counties adjacent to the river have united

to carry out proposed plans of improvement, and considerable work has been done under their supervision.

40. Work of improving began at the upper end by the straightening and deepening of the channel by adjacent landowners. This work resulted in an improved channel having a width of about 8 feet and a length of 7 miles. The effect of this and succeeding improvements was to quicken the run-off from the adjacent territory and thereby increase the floods on the lands below to such an extent as to make necessary a continuation of the channel improvement. Under the names of the Miller, the Kankakee Improvement Co.'s, the Place, and the Kankakee Reclamation Co.'s ditches the river has been straightened from its source to the west line of Starke County, a distance of about 46 miles, or approximately one-half the distance to Momence. The length and location of these ditches were as follows:

41. The Miller ditch, 7¾ miles long, was a continuation of the small ditch above noted and extended to the Wabash Railroad bridge.

42. The third section, constructed by the Kankakee Improvement Co., was 5½ miles in length and extended from the Wabash Railroad bridge to the Baltimore & Ohio Railroad bridge.

43. The fourth section, 9.1 miles in length, known as the Place ditch, extended from the Baltimore & Ohio Railroad bridge to a point about 2 miles below the Pennsylvania Railroad bridge.

44. The fifth section, 16.7 miles in length, was constructed by the Kankakee River Reclamation Co. and completed in 1906.

45. These various works resulted in a straightened channel having a bottom width of 8 feet at its upper end and 110 feet at its lower end, with a depth of about 8 feet. With exception of the first 7 miles, the work was done under the provisions of the drainage laws of the State of Indiana, the cost being assessed to the adjoining landowners. The entire cost of the work done is stated to be approximately $350,000. Originally very sinuous, the improved section of the river is now practically a ditch with long tangents and few turns. Since its completion, in 1906, numerous shoals have formed in the channel, leaving a controlling depth of only 4 or 5 feet.

PROPOSED RECLAMATION WORKS.

46. Acting under the State drainage laws, a petition has been filed with the Laporte County circuit court for the reconstruction of the channel under the name of the "Dixon W. Place ditch," from the head of the original "Miller" ditch to the west line of Starke County, a distance of about 39 miles, and for the widening and deepening of 26 lateral ditches for distances varying from 1,400 to 19,000 feet from the river. The proposed channel is to have a grade from the upper end to English Lake Station, about 23 miles, of 0.015 foot in 100 feet, or about 9 inches to the mile. From English Lake Station to the west line of Starke County the grade is to be 0.01 foot in 100 feet, or about 6 inches to the mile. The section at the upper end is to be 20 feet wide on the bottom and 10 feet deep, with side slopes of 1 on 1, and is to increase in width between the upper end and the mouth of the Yellow River, from which point downward it is to have a bottom width of 90 feet and a depth of 10 feet, with side slopes of 1 on 1.

The total estimated cost of the improvement is about $467,000. This channel, if constructed, will have a capacity from the mouth of the Yellow River to English Lake Station of about 2,700 second-feet, and below English Lake Station a capacity of only 2,200 second-feet, the decreased capacity in the lower reaches being due to the reduced grade.

47. A continuation of the above channel, known as the Marble ditch, is under construction at the present time. This project provides for the straightening and deepening of the river by the construction of a channel from the west line of Starke County to a point about 7 miles east of the State line, and is to follow the line proposed by Mr. Downey in the report of the United States Department of Agriculture, hereinbefore referred to. The total length of the proposed improvement is about 28 miles. The first 16 miles is to have a section 70 feet wide on the bottom, and 10 feet deep, with side slopes of 1 on 1; the lower 12 miles to have a section 100 feet wide on the bottom with the same depth and side slopes. The channel is to have a grade throughout its entire length of 0.02 foot in 100 feet or approximately 1 foot per mile. When completed the channel will have a capacity at its upper end of approximately 2,400 second-feet and at its lower end of about 3,370 second-feet. The estimated cost of the improvement is about $300,000.

48. The Williams ditch is a proposed extension of the Marble ditch to the State line, following with a few exceptions the line of the channel as proposed by Mr. Downey. This project provides for a channel having the same section and grade as the Marble ditch for a distance of about 2 miles. Thence to the State line the channel is to be 120 feet wide on the bottom with a grade of 0.01 foot in 100 feet or about 6 inches to a mile. This channel will have a capacity at its lower end of about 2,970 second-feet. The estimated cost of the improvement is about $94,000. It has been stated that the landowners in the vicinity of Momence are considering an application for injunction to prevent the construction of the Williams ditch on the ground that it would increase the flood conditions in the valley below. Below the State line the river is in an unimproved condition and no works of improvement are contemplated except the reconstruction and cleaning out of a drainage channel known as the Singleton ditch and the removal of the Riffles at Momence, contract for which has been let.

ENGLISH LAKE.

49. The most serious flood occurs in the vicinity of the mouth of the Yellow River. Between the Yellow River and the Chesapeake & Ohio Railway crossing, about 4 miles below, is that section of the Kankakee River known as English Lake. The Chesapeake & Ohio Railway crosses the valley on a solid fill, thus acting as a dam and forming a large basin into which is discharged the combined waters of the upper Kankakee and Yellow Rivers, whose only outlets are the English Lake and "Machler ditch" crossing of the railroad. This section is extremely flat for many miles on each side of the Kankakee River and in high-water periods is covered with water to a depth of 4 or 5 feet. In May, 1914, Mr. Franklin Glenn, of Knox, and Mr. G. F. Stinchfield, of Valparaiso, civil engineers, made float measurements of the Kankakee and Yellow Rivers in flood, and

obtained a combined discharge of between ten and eleven thousand second-feet. Measurements of flow past the Chesapeake & Ohio Railway during the same flood gave a discharge of about 2,400 second-feet, indicating a retention in the storage basin of about 8,000 cubic feet per second. A computation of the area submerged in connection with the rate of rise of the water surface gave a fair check upon the amount of water retained. The area flooded is stated to have been about 6,000 acres on the east side of the Kankakee and about 15,000 acres on the west side, to an average depth of about 4 feet.

YELLOW RIVER.

50. The worst conditions in the district near and below the mouth of the Yellow River are due to the flood discharge of the latter. The Yellow River rises in the northwest corner of Kosciusko County and flows in a southwesterly direction through Marshall County, thence in a westerly direction through Starke County, to the Kankakee. In its unimproved condition the river had a slope of about 4 feet per mile down to a point about 2 miles east of the Kankakee River, where the slope changed to only 1 foot per mile. From the Kankakee to about 7 miles above Knox, a distance of about 14 miles, the river has been replaced by an artificial channel known as the "Elsbree ditch." The original petition for the construction of this ditch provided for a channel with a bottom width of 20 feet and a depth of 8 feet. Owing to considerable opposition to the project the court ordered the construction of a channel having a bottom width of only 8 feet. Below Knox this channel ran due west and emptied into the old bed of the Kankakee River about three-fourths of a mile below the old mouth of the Yellow River. The channel as constructed was totally inadequate to carry the large flood discharge of the Yellow River. The soil being very sandy and susceptible to erosion, the river has scoured out a channel with well-defined banks to about 4 miles below Knox. At the Nickel Plate Railway bridge, about 1 mile below Knox, the channel is about 130 feet wide and from 9 to 10 feet deep; below this bridge the depth gradually decreases until, at a point about 3 miles from the Kankakee, the channel is entirely filled with sand and the river has broken through north and now empties into what is known as the Larimore ditch. During flood periods the Yellow River below the break in the channel spreads all over the surrounding country, and is partly carried off by adjoining drainage ditches. In a report made in 1913 by Isham Randolph & Co., consulting engineers, upon the "Preventing of overflow and reclamation of bottom lands in the Yellow River and Kankakee River basins in Starke County, Ind.," Mr. Randolph makes the following statement relative to the flood conditions existing in the Yellow River vicinity:

> The country is all cut up with ditches, and I make the assertion that no one of them is effective. The artificial channel made for the Yellow River has become an effective dam against it and it is forced to find its outlet in short reaches of its old channel and in the ditches on both sides of the Elsbree. The country is in effect a delta of the Yellow River and its many-mouthed outlet is through channels that were not designed and were never intended to carry it. * * * As the waters recede the drainage ditches are forced to take care of the Yellow River and perforce are unable to perform their proper functions. Yellow River is in effect "Lost River" and the entire system of drainage in the country is not worth its maintenance.

PROPOSED IMPROVEMENT OF YELLOW RIVER AND VICINITY.

51. Various plans have been proposed for protection against flood conditions in this locality. The project for the reconstruction of the channel of the Kankakee under the name of the "Place ditch," previously referred to, also provides for the dredging of a channel 60 feet wide and about 10 feet deep for a distance of about 3½ miles along the line of the old Elsbree ditch. This channel if constructed would simply be the restoration of the lower end of the old Elsbree ditch with an increased capacity and would probably fill with sand as did the Elsbree ditch. Upon meeting the dead back waters of the Kankakee the large amount of sand carried in suspension by the Yellow River in flood is deposited at this point and such conditions will prevail unless a channel adequate to prevent overflow is provided for the Kankakee itself.

52. The proposed Place ditch improvement of the Kankakee River provides for a channel having a capacity at the mouth of the Yellow River of only 2,700 second feet, probably insufficient to carry the combined flood discharge of the Yellow and upper Kankakee Rivers, amounting to 14,000 second feet, and probably inadequate to prevent the frequent overflow of the lands in this vicinity.

53. A more comprehensive plan for improvement is proposed in the petitions filed in the Starke and La Porte County courts for the construction of a system of levees along the banks of the Kankakee and Yellow Rivers for the protection of the lands of these two counties against overflow.

54. The Starke County project, under the name of the "George H. Brown Levees," provides for the construction of parallel levees, 500 feet apart, inclosing the Elsbree ditch or Yellow River from the Nickel Plate Railroad to within a quarter of a mile of the Kankakee River. From this point the levee along the north bank of the Elsbree ditch turns northeasterly and runs parallel to the Kankakee River for about three-quarters of a mile and then east, parallel to the Larimore ditch for about 1 mile. From a similar point near the Kankakee River the levee along the south bank turns southwesterly and runs parallel to the Kankakee River for about 1½ miles, and thence east for about 3½ miles, parallel to the Williams ditch. The estimated cost of the project is about $60,000.

55. The proposed LaPorte County levees, known as the "Howe Levees," are to extend in a southwesterly direction along the west bank of the Kankakee River from a point about 2½ miles above the mouth of the Yellow River to a point below English Lake, a distance of 9.27 miles. The estimated cost of this project is approximately $51,000.

56. Either of these two levee systems, which are on opposite sides of the Kankakee, would probably be effective in preventing overflow on the side on which it lies, but if either were constructed without the other there would of course result greater overflow of the lands on the opposite side of the river.

57. These systems of levees may be so constructed as to reclaim some 20,000 acres, although pumping may occasionally be required. The effects of their construction would include an elimination of the storage basin now afforded by the lands that would be reclaimed, and a raising of flood heights above the levees, with consequent increase

of storage capacity there at the expense of greater overflows. The net result upon the flow of the stream below the levees is difficult of ascertainment from existing data.

RESULTS OF WORK DONE.

58. While a large amount of work has been done throughout the valley for the reclamation of the marsh land, both in straightening and deepening the river and in constructing drainage ditches and other works of improvement, the results attained have not been what might have been obtained from the labor and money expended, owing to a general lack of cooperation among the parties interested and to the failure to adopt a comprehensive plan of improvement embracing the whole valley. The works of improvement have for the most part been done by local interests in a haphazard manner without due consideration of the problems involved or of the effect of such improvements on other sections of the valley.

59. While the work of improvement has not been done to the greatest advantage, it has, nevertheless, resulted in a partial reclamation of the marsh lands. Of the 400,000 acres comprising the original marsh, it is perhaps not far from the truth to say that about one-third has been reclaimed and is under cultivation, one-third is in a partial state of cultivation but subject to occasional overflow, while the remainder is waste land.

60. In many cases, due to improvements in the local drainage conditions, lands a few years ago worth $40 are now worth from $100 to $200 per acre. On the other hand, many farms have been partially improved but have been worked at a loss, due to overflows resulting from faulty or deteriorated drainage systems. In that one-third of the original marsh area which it is stated above is in a partial state of cultivation the loss of crops is frequent, and only very optimistic persons, experiencing greater losses than profits, here expend labor and capital.

DISCUSSION OF PLANS OF FURTHER IMPROVEMENT.

61. To devise the most perfect and comprehensive project for flood protection, which in this case means land reclamation, would require a survey in great detail. Owing to the extremely flat character of the land and to the poorly defined watersheds, contour intervals of about 1 foot would be required over the whole area. The cost of such a survey would be great relative to the area.

62. While no detailed plans for reclamation can be made in the absence of such a survey, it is probable that the preparation of them would involve consideration of certain major features as follows: A deepening, straightening, and widening of the river from the mouth of the Yellow River to a point a mile below Momence, and the construction of levees with provision for pumping plants where necessary. Probably a combination of the two would be shown to be the most economical.

63. Assuming a discharge at Momence of 23,000 second-feet, corresponding to a run-off from the area above the mouth of the Yellow of one-half inch in 24 hours and from the area in the basin below

of one-fourth inch in 24 hours, the open channel required would have a bottom width of 420 feet at its upper end and 650 feet at its lower end with a uniform depth of 10 feet. The excavation of such a channel would require the removal of something like 50,000,000 cubic yards of material, and the cost would, of course, be prohibitive. It is recognized that such a large waterway is the maximum that might be found necessary as the result of any future survey, and probably far greater than would be required sufficiently to ameliorate flood conditions.

64. A combination of dredged channel and levees with the channel carrying 7,200 second-feet and the remainder confined by levees would cost far less, but even this less costly project might hardly be justified as an economical proposition. As has been stated above, Mr. M. H. Downey, in a report published in Circular 80, Department of Agriculture, 1909, has estimated that a channel carrying 7,400 second-feet and costing $1,000,000 would serve all practical purposes. This I am not prepared to dispute, inasmuch as agricultural lands will stand occasional overflows, if they be infrequent and not prolonged, without serious loss of value.

65. It is not probable that the reclamation of the marsh lands will be a success until a comprehensive plan of improvement is adopted under one management. If the marshes were in one State, a large drainage district could be created covering the whole valley. Under the existing conditions the only way to create such a district would be by cooperative legislation by the States of Indiana and Illinois. Such a bill was before the Indiana Legislature in 1915, but was unfortunately defeated by parties who believed that their own benefits would be less than the costs to be placed upon them.

66. If it were logical for me to recommend that the United States should undertake any portion of the reclamation of the Kankakee marshes, I should be of the opinion that such work should be limited to some such channel as was recommended by Mr. Downey, the exact character of the channel and its cost to be determined as the result of a survey of the whole basin, in such detail as to show the contours at 1-foot intervals, and the support of some Federal agency for a period of years, during which it would advise local authorities from data furnished by the survey as to all local operations so that the same might fit into a proper comprehensive plan. It is apparent, however, in view of what follows, that the cost of reclaiming the Kankakee marshes should in fairness be borne by the lands which will thus be enhanced in value, and it ought to be possible for the States interested to work out a proper procedure.

NAVIGATION FEATURES AND COMMERCIAL STATISTICS.

67. With the exception of its use by a few pleasure launches there has been no navigation of the Kankakee River since 1885. From its mouth to Momence the river is obstructed by three fixed dams and by seven railroad and nine highway bridges. Above Momence there are 15 railroad and 15 highway bridges. None of the bridges are provided with draw spans.

68. The principal towns which might be benefited by an improvement of the Kankakee River for navigation purposes are Wilming-

ton, Ill., located about 9 miles above the mouth of the river, with a population of about 1,500; Kankakee, Ill., about 4 miles below the mouth of the Iroquois River, with a population of about 15,000; and Momence, Ill., with a population of about 2,500. Other towns are located near the river, but too far removed from it to be benefited by such improvement. The most important of these are Knox, Ind., with a population of about 1,700; North Judson, located in Starke County, Ind., with a population of about 1,200; and Lowell, located in Lake County, Ind., with a population of about 1,300.

69. An effort has been made to obtain the commercial statistics of the three towns which might be benefited by an improvement for navigation. The commerce of these towns, in and out bound, during the calendar year 1914, as reported by the local manufacturers, shippers, and dealers, was as follows:

	Tons.
Wilmington	48,340
Kankakee	604,490
Momence	31,100

Of this commerce the principal receipts were coal, iron, and timber. The principal shipments were manufactured iron, agricultural machinery, tile, stone, and grain. The largest single item of this commerce is that of stone, 310,000 tons of which was reported as shipped from the quarries near Kankakee to points within a radius of 100 miles. A detailed statement of the commercial statistics is given in Appendix B.

70. The community adjacent to the river is essentially agricultural. There are no large cities, no industries, and no mines which would afford a water-borne commerce at all commensurate with the expense of improving the river for navigation purposes. The river leads to no important commercial center nor would it form a thoroughfare for commerce between waters now navigable.

71. In the course of my investigation, which has led me to various points in the Kankakee Basin, I have encountered very few who advocate the improvement of the Kankakee for navigation purposes. Among replies to circular letters from this office sent to parties whom it was thought might present arguments for an improvement to promote navigation, addressing themselves especially to the question of the benefits to be derived, if any, from the improvement of the lower Kankakee for navigation purposes, a great majority recorded themselves in the negative and more were noncommittal than favored such improvement. A number of extracts from these replies are quoted in Appendix A, to which attention is invited. The general sentiment of the valley is directed toward securing improved conditions of flow for land reclamation purposes. As a matter of fact the drainage of the Kankakee marshes, through the elimination of their reservoir action, would lead to a more rapid and uneven run-off. This in turn would increase flood heights and lower low-water stages, however slightly, upon the Illinois River, which is under improvement and now used for navigation. These effects upon the regimen of the Illinois would, although in but slight degree, be detrimental to navigation.

CONCLUSIONS.

72. I am constrained to report, therefore, that "the value of protection to navigation" (see the item of law providing for this preliminary examination) which would be afforded by such "flood protection" as is desired by the people of the Kankakee Valley is in fact negative; and that as a result of the entire lack of benefit to the Federal interest of navigation which the act indicates to be the measure of proposed Federal contribution, the United States should not "cooperate with the States and other communities and interests in carrying out" any plans for the improvement of the Kankakee River.

73. No survey is recommended by reason of the absence of any constitutional Federal interest.

74. The problem of flood protection being confined to that portion of the river above Momence, there are no questions of terminal facilities, water power, or other related subjects involved in this examination.

W. V. JUDSON,
Lieut. Col., Corps of Engineers.

[First indorsement.]

OFFICE DIVISION ENGINEER, LAKES DIVISION,
Buffalo, N. Y., November 8, 1915.

To the CHIEF OF ENGINEERS:

Forwarded, concurring in the conclusions of the district officer as stated in paragraph 72 of his report.

J. G. WARREN,
Colonel, Corps of Engineers.

[For report of the Board of Engineers for Rivers and Harbors, see p. 3.]

APPENDIX A.

The following are extracts from replies to circular letters sent to parties who were thought to be interested in the investigation.

Letter of Mr. W. P. Betterton, of Kouts, Ind., dated June 30, 1915.

"* * * Yours of recent date at hand in regard to the Kankakee River drainage; will say we don't need flood protection. Do not believe the Government could make it navigable at any small expense; the country is all low and flat marshes; that the land can be drained and made valuable for farming which is being done at the present time with dredges. The county is doing some drainage work here at this point. * * *."

Letter of Mr. Henry A. Barnhart, Member of Congress, dated Washington, D. C., June 15, 1915.

"* * * Of course you are advised that the difficulty about improving the Kankakee River is an interstate problem of getting the ledge of rock out at Momence, Ill., whereby there might be fall enough to deepen and widen and straighten the river through Indiana. It seems to me to be a great waste of the advantages to millions of people to have this Kankakee fertile valley in slough land for lack of drainage, and as our State can not go into Illinois and provide an outlet it seems to me that it will be necessary for the Government to take some steps whereby this very profitable river improvement can be accomplished."

Letter of Mr. Charles H. Peters, of Knox, Ind.

"In Starke County and La Porte County there are between thirty-five and forty thousand acres of land subject to overflow, on which it is impossible to raise any crops

whatever. These lands are among the richest in the State, and drained are easily worth $150 or more per acre. They are particularly valuable for trucking crops. In addition to this there are twelve or fifteen thousand acres of land on which only partial crops were raised, owing to the overflow of the Kankakee River. This land is now practically of no value as farm land.

"These lands are subject to floods during May, June, and August and also February and March of each year. Floods last for from two to four weeks and ruin the crops on considerable portions of the acreage as given above. The estimated discharge of the river at flood stage of the Kankakee River taken at a point on the Kankakee Reclamation Co.'s ditch where the Nickel Plate Railroad crosses the same at 8,000 cubic feet per second. This has been measured by our local engineers and also by the War Department engineers who are in charge of the Lake Erie-Lake Michigan Canal. Their measurement was a check on the work of the local engineers. In addition to this 3 miles below this town the Yellow River discharges into the Kankakee Reclamation Co.'s ditch and the measured discharge from 6,000 cubic feet per second making a total of at least 14,000 cubic feet per second flood discharge in the Kankakee River. Drainage work undertaken by the county in the past consists of a number of ditches connected one to another running from 30-foot bottom at the beginning near South Bend to 50 feet at the county line between Starke and Jasper Counties, and a further ditch being dug from that point to within about 6 miles of the State line between Indiana and Illinois. This ditch will be 70 feet wide at its beginning and 110 feet wide at its end and will be 5 feet lower than the bottom of the present channel of the Kankakee River at the end.

"This new channel and the channel already constructed have an average fall of about 1 foot per mile and is less than one-fifth the size required to take care of the ordinary discharge of the Kankakee and Yellow Rivers at the time of the average floods in the spring and fall, its capacity when running bank full being something less than 3,000 cubic feet per second."

"The best plan for carrying out any improvement of the Kankakee River would be to take the whole valley into one project, under one management and devise a plan for a channel of sufficient size with levees in the lower parts or lower lands of sufficient height to prevent the overflow of the farm lands. Until such project is undertaken the work will be done in a haphazard manner without any attention being paid to the engineering features presenting themselves but by guesswork only and will not be of a size to afford any permanent protection or, at the best, the work done will afford only a temporary relief for the same portions of the higher lands which are now subject to floods in extreme high water."

* * * * * * *

Among the answers to a question asking for an opinion as to the benefits to be derived, if any, from an improvement of the lower Kankakee for navigation purposes were the following:

"* * * The benefits would be immense."—J. H. Ray, Wilmington, Ill.

"* * * Benefits would be slight if any, in my estimation practically nil."—Kankakee Rendering Works.

"River no benefit to us."—Kankakee Foundry Co.

"* * * Indirectly I believe the whole community would be greatly benefited and unless the cost is too great I would be glad to see it go through."—Northern Illinois Granite Co., Kankakee, Ill.

"None at present."—Paramount Knitting Co., Kankakee, Ill.

"No direct benefits that we know of."—Kankakee Tile & Brick Co.

"If constructed would help materially in meeting Panama Canal rates to Pacific coast which is 60 cents to $1 less per hundred than by railroad from Chicago. Chicago and vicinity is loosing piano business to Atlantic cities due to cheaper water rates and applies to other commodities."—Price & Teeple Piano Co., Kankakee, Ill.

"Not any."—International Harvester Co. of America, Kankakee, Ill.

"Benefits would not sanction expenditure necessary."—Kankakee Elevator Co.

Letter of Mr. C. M. Clay Buntain, attorney at law, Kankakee, Ill., dated August 17, 1915:

* * * * * * *

"Aside from hand crafts and minor concerns there are nearly 45 factories here now and employ about 1,600 people, or 11.2 per cent of the population, at an average wage of $469 yearly; capital invested $2,600,000; value of products $2,800,000; cost of material $1,500,000, or 55 per cent of product value; horsepower used, primary, 4,000, and cost of power equal to 2.5 per cent of product value."

APPENDIX B.

Commercial statistics, Wilmington, Ill.

RECEIPTS AND SHIPMENTS DURING THE CALENDAR YEAR 1914, IN SHORT TONS.

Receipts, items.	Quantity.	Shipments, items.	Quantity.
	Tons.		*Tons.*
Coal	15,600	Boxboard	7,900
Sulphite, pulp, etc	8,840	Grain	4,[illegible]
Lumber, brick, cement, etc	10,000	Unclassified	1,600
Unclassified	500		
Total	34,940	Total	13,[illegible]

Commercial statistics, Kankakee, Ill.

RECEIPTS AND SHIPMENTS DURING THE CALENDAR YEAR 1914, IN SHORT TONS.

Receipts, items.	Quantity.	Shipments, items.	Quantity.
	Tons.		*Tons.*
Coal	40,000	Iron, manufactured	30,000
Iron, manufactured	60,000	Hides and tallow	1,100
Lumber	30,000	Millwork	150
Hides and tallow	1,200	Hosiery and yarn	1,500
Granite and marble	200	Furniture	1,000
Cotton, raw and manufactured	1,800	Tile	30,000
Brick, cement, slate, etc	16,500	Farming implements	31,500
Paints, oils, and glass	500	Overalls	240
Tile	800	Lime, cement, etc	12,000
Farming implements	1,500	Stone	310,000
Unclassified	3,500	Beer	3,000
		Grain	27,000
		Unclassified	1,000
Total	156,000	Total	448,490

Commercial statistics, Momence, Ill.

RECEIPTS AND SHIPMENTS DURING THE CALENDAR YEAR 1914, IN SHORT TONS.

Receipts, items.	Quantity.	Shipments, items.	Quantity.
	Tons.		*Tons.*
Coal	6,800	Grain	6,000
Timber	10,000	Lumber	1,000
Gravel, lime, cement, etc	4,000	Ladders, trestles, etc	2,000
Unclassified	800	Unclassified	500
Total	21,600	Total	9,500

LETTER OF MR. FRANCIS M. TRISSAL.

CHICAGO, *December 18, 1915.*

GENTLEMEN: The document inclosed is presented by a representative of interested Indiana landowners as a statement of their contentions in respect to the uses of the waters of the Kankakee River. And because of the connection of its waters as tributary to the Illinois River, this letter communication is offered for reading and consideration as germane to the subject of a discussion by representatives of the State of Illinois on the occasion of the public hearing to be had on the 22d instant, mentioned in the Chicago press.

For the information of the Board there is appended hereto a copy of a joint resolution of the general assembly of the State of Indiana, found on page 498 of its acts of 1911.

The State of Illinois has made no response, nor taken any action whatsoever in regard to the matters therein mentioned, and manifestly will not do so unless so required by Congress as a condition upon which it may become availed of the million-dollar conditional appropriation made by the Sixty-first Congress or another.

For that reason owners of lands in Indiana that border the Kankakee River and have a proprietary interest in its waters and their flowage urge that any appropriation that may become available to the State of Illinois should in justice to them be used in part for the performance of the neglected duty owing to them by the State of Illinois.

The powers reserved to Congress by the Constitution of the United States to regulate commerce among the States are quasi judicial in their nature, the power to regulate embodies and implies the power to adjudicate, and Congress may appropriately act in analogy to courts of equity and in harmony with the adjudications of the Supreme Court of the United States where the rights of sovereign States or the citizens of different States are in conflict or require a harmonious settlement, and in the circumstances here existing Congress is the only power that can act.

The State of Illinois, in asking an appropriation to remove a rock obstruction in its Illinois River, near Utica, is seeking equity from the Federal Government to the end that it may obtain the free flowage of the waters of its river, not merely to aid navigation and the construction of a great deep waterway, but to serve a great and profitable commercial enterprise by the use of the power that will be afforded, and to also aid a municipal body it has created in one of its purposes of diluting Chicago sewage.

The axiom that he who seeks equity should do equity should apply to Illinois, and it should come into court with clean hands.

This it does not do by permitting an obstruction to remain at Momence to stifle sanitation and injure its own people and those of another State, while it holds out its hands for money to aid sanitation and navigation at Utica and to promote its selfish purposes in other respects.

The extent to which waters in which the proprietary rights of Indiana citizens are drawn upon to serve any of these purposes should be compensated for by a division of the appropriation sought that the wrong permitted may in a measure be righted.

The waters of the Kankakee that have been canalized by Indiana landowners and brought to the borders of Illinois are the same that Illinois purposes to use in the manner mentioned.

Whether these waters percolate or pour
Without or within bed or shore,
As into the Illinois they pass
Over moraine and morass,
Through wide or narrow rill,
They are Kankakee waters still,

and the citizens of Indiana are entitled to equal facilities in their use in going "down to the sea in ships to do business in the great waters," in imitation of the Biblical characters.

As this board in its recommendations to the congressional committee it serves may report facts as well as conclusions, the representative of these citizens of Indiana respectfully asks, on their behalf, that their rights be recognized and considered.

Respectfully submitted.

FRANCIS M. TRISSAL.

The BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

A JOINT RESOLUTION PERTAINING TO THE KANKAKEE RIVER.

Be it resolved by the Senate and House of Representatives of the General Assembly of the State of Indiana, as follows:

Whereas by the provisions of section 8 of Article I of the Constitution of the United States the power to regulate commerce among the several States belongs to the Congress of the United States, and this power, as defined by the Supreme Court of the United States, extends to every species of commercial intercourse between citizens of different States, and comprehends the control for that purpose, and to the extent necessary, of all the navigable waters of the United States, including the power to keep them open and free from obstruction, and to make them accessible from a State other than the one in which they lie; and

Whereas the Kankakee River has its source in the State of Indiana, and its waters unite with those of the Desplaines River in the formation of the navigable and navigated waters of the Illinois River, and its bed from its source to its mouth is a drainage basin and so related to the Illinois River that the waters of both are interstate and form the same stream and should be considered as a unit, but their flowage from the State of Indiana is greatly obstructed by the existence of a ledge of rock in the bed of the stream in the State of Illinois at a point immediately west of the Indiana State line, and such obstruction results in great injury to many citizens of the State of

Indiana, because of the overflowing and hindrance to the drainage of a large area of valuable agricultural Indiana land, and is an obstruction to sanitation and both to domestic and interstate commerce, and the proper uses and conservation of its waters are also thereby prevented; and

Whereas the State of Illinois has made no effort to remove such obstruction, and the State of Indiana is without power to do so, and because of the restrictions upon the powers of the States contained in section 10 of Article I of the Constitution of the United States the States of Indiana and Illinois may not without the consent of Congress enter into any compact or agreement with each other whereby such obstruction might by their joint action be removed:

Therefore we instruct our United States Senators and respectfully request the State's Representatives in the Congress of the United States to call for and secure such congressional legislation and aid as may be necessary to effect the removal of such rock obstruction and to make other improvements of said Kankakee River; and the governor of this State is hereby respectfully requested to transmit a copy of this resolution to the governor of the State of Illinois, with the request that the governor of that State submit the same as a petition of the State of Indiana to the legislature of the State of Illinois to either make proper provision for the removal of such obstruction to interstate commerce or to join in the call upon Congress for aid in its removal; also to grant either to the State of Indiana or to the Government of the United States any such rights as the State of Illinois may have in the bed of the Kankakee River as may be necessary to therein carry on any river improvement for which provision may be made; and be it further

Resolved, That a copy hereof be transmitted by the governor of Indiana to the United States Senators and Representatives in Congress of both the States of Indiana and Illinois.

UNITED STATES OF AMERICA—IN THE MATTER OF AN EXAMINATION OF THE KANKAKEE RIVER PROVIDED FOR BY THE RIVERS AND HARBORS ACT OF CONGRESS OF MARCH, 1915—STATEMENT OF FACTS AND ARGUMENT IN SUPPORT OF THE PROPOSED IMPROVEMENT AND CHALLENGING THE CORRECTNESS OF THE ADVERSE REPORT OF EXAMINING ENGINEERS.

To the honorable Board of Engineers for Rivers and Harbors and Members Congressional Committee:

It is respectfully shown that the rivers and harbors act of March, 1915, in its provisions relating to the Kankakee River contemplated an examination that would deal with the conditions existing at the boundary line of the States of Indiana and Illinois. At this point a rock obstruction formed in the bed of the river varying in its height from 2 to 6 feet above its bed below, and about 4 miles in its width, at most places, extends west in Illinois for a distance of about 6 miles from the Indiana State line, terminating near the western corporate boundary of the city of Momence.

Each foot in height of this obstruction causes the overflow of a mile of territory above Momence during high-water periods, and it also has the effect to impair the efficiency of extensive and expensive drainage work above it.

The occurrence of flood periods are becoming more frequent because of the drainage and river improvement above the rock, completed and carried on by the landowners of Indiana to reach and use the river as the only outlet that can be availed of.

To remedy these flood conditions the opening of a channel through this rock to a depth corresponding with the location of the beds of the river below and of a width of 100 feet or more, has at times been recommended by different engineers.

This river is the outlet for the drainage of 1,420,000 acres of lands of which 400,000 acres are marsh plain.

The United States Department of Agriculture caused an investigation to be made in the years 1905 and 1906 to determine as to practical methods for drainage of lands of the valley.

The drainage work that has since been and is now being carried on closely follows the recommendations of the report and the surveys that were then made.

The report was printed in February, 1909, and appears as Circular 80 in the records of the Department of Agriculture.

Indiana landowners have burdened themselves with large expenditures in the improvement of this river without the aid of any contributions from the United States. The State of Indiana in the years 1889 and 1891 by legislative enactments appropriated $65,000 to pay for work in an unsuccessful attempt to remove this rock, which were expended in work in Illinois; no other appropriations have been made.

The length of the river in Indiana from its source near the city of South Bend as it meanders is 240 miles.

On a straight line to the Momence Rock it is 81 miles in length.

Prior to the year 1909 drainage work that consisted of straightening the channels of the river and in cutting off bends in it reduced its length for the carriage of water to 46 miles from its source to the west lines of Laporte and Starke Counties. The average bottom width of the river as improved is 50 feet, its depth averages 9 feet of water in practically all seasons of the year, and its fall is about 1 foot per mile. There is now in process of construction another stretch of improvement for a distance of 27 miles from the west lines of the counties mentioned. This work will be completed within a year, and is similar to the work above except that the width at the bottom is 70 feet.

The cost of the public drainage and river-improvement work already done, and that in contemplation in proceedings under the drainage laws of the State, now pending, approximates fully two and a half million dollars, of which half a million will be expended in the reconstruction and extension of work from the source of the river to the point of connection with the 27 miles now in progress, if the work petitioned for shall be established in legal proceedings mentioned, which is probable.

This reconstruction work will give a bottom width of about 100 feet to afford an ample channel for both drainage and navigation.

Assessments of special benefits upon lands have provided funds for the construction of all work that has been done, and that to be done will be paid for in the same way.

A retrospective view of many drainage projects of far less magnitude than the work that Indiana landowners have carried on in and along this river show that many such improvements were adapted to and used for purposes of transportation. The records of the United States National Waterways Commission (Doc. No. 18, p. 49) afford evidences of this fact, particularly in reference to Holland, where it is stated that "a large part of the canals were originally intended for the purposes of drainage, but were afterwards made equally available as a means of transport."

The Chicago Drainage Canal was originally designed purely as a sanitary affair, but far-seeing interests so enlarged its objects as to make it serve the purposes of navigation. The connections of this Chicago Drainage Canal and the navigated Illinois River with the waters of the Kankakee command attention in considering the value of the waters now furnished and the practicability and probabilities of future uses of the entire Kankakee for purposes of navigation. Its waters and the waters of the Desplaines River unite to form the source of the Illinois River, and without their waters and water from Lake Michigan there would not now be a sufficient stage of water for successful navigation in the Illinois.

A controversy that is international in its character in reference to the lowering of the waters of Lake Michigan for the uses of the Chicago Drainage Canal, with which the War Department is familiar, shows that there are limitations to the uses of waters from the Lakes and how important the conservation of the waters of the Kankakee becomes for "the protection of navigation" of the Chicago Drainage Canal as now carried on, and as it may be extended and connected with waterways now under the jurisdiction of the Federal Government, and to aid in the dilution of sewage.

That this entire river with the vast volume of water constantly pouring into it from its source to its mouth and now overflowing its valleys may become availed of for its own navigation at no distant day is not among the improbabilities, especially when it is considered that it is within the zone where navigation may be open at all seasons of the year, that it environs great manufacturing and commercial cities of two States, and passes through a country the drainage of the lands of which show its agricultural productiveness to be of the highest character.

The rivers and harbors act in its provisions relating to this river may be fairly said to have responded to the policies of treating each interstate stream as a unit from its source to its mouth, of so improving it as to promote conservation, the drainage of lands, the control of waters to prevent flood destruction, and to insure the highest utility and the general welfare in all respects. It recognized the fact that these results can best be secured through cooperation between the United States and States, and by its provisions required participation in all examinations and proceedings in respect to this river by the executives or other agencies of the States. If all obtainable information as to existing facts and conditions had been sought before or while the reported examination was in progress perhaps a conclusion other than that reported might have been reached, or at least deserved mention might have been made of the "protection" of other and related interests as well as of the naked subject of navigation alone.

As the "States and other communities and interests" have seemingly been ignored in the preliminary examination that has been reported it is assumed that the hearing and proceedings before this board will be de novo, and that the facts and arguments now presented will be given consideration by both this board and the committee of Congress to which it shall report, and not be overlooked by other members of Congress. It is most respectfully submitted that the provision in the act respecting "the value of protection to navigation" should not have such a construction as to have the effect of "a joker in legislation" and be seized upon to render ineffectual the other provisions and purposes of the act, and that it should not be considered and held that the waters that are strangled in their circulation because of the obstruction to their passage, but nevertheless already reach the head of the stream where navigation begins perform no part in its protection. The words "value of protection to navigation" used in the act have seemingly been so narrowed in their meaning by examining engineers as to have an application only to navigation as it already in fact exists, and not to the subject or fact of navigability as it may be extended by the removal of the only serious obstacle that now stands in the way of its upper extension for approximately 130 miles. The rules for construction of legislative enactments require their general scope and purpose to be considered to the end that all the objects aimed at may be accomplished.

The objects here aimed at were flood protection, commercial regulation, adjustment of interstate relations and rights, and in part the extension of navigation into waters not now navigable the navigation of which would become an accomplished fact by the removal of an obstruction to enable it to be carried on and connected with that now existing.

If the annual $50,000,000 appropriations by Congress have neither resulted in nor aimed at any extensions of navigation the country at large has been under a delusion as to their necessity and propriety, and it would be well to dispel this suspicion by now giving to the country some evidences that it has not been well founded by the practical example of the interstate inland waterway improvement that the removal of this obstruction would afford. Here is a good place and a proper opportunity, for a beginning of the redemption of political promises of all parties in respect to inland waterway improvements.

No mere chimerical scheme nor unimportant local project would be disclosed by a view of the conditions that exist above this obstruction. The drainage work and river improvement above it completed and progressing bring into clear view an almost completed canalization of this interstate river with a channel of 100 feet in bottom width carrying a stage of 9 feet of slowly moving water for a distance of 75 miles from its source to reach the Illinois line that is available without cost to aid in the encouragement and "protection of navigation" below, and the waters below only require slight regulation of their velocity that all may move together in their natural course to their confluence with the now navigated Illinois River to insure the fullest protection to navigation as it now exists; and even assuming that the words of the act give it only an application to existing navigation an erroneous conclusion has been reached.

But for the unusual conditions existing at the boundary of these States all of the waters of this river and its entire length would now be navigable and manifestly would become so immediately if the obstructions shall be removed.

Their removal becomes most important not alone for the promotion of navigation and its extension but as a regulation of commerce and an adjustment of the relations and rights of two sovereign States at the line that bounds them and which can only come from congressional action. If this obstruction in the State of Illinois were other than natural in its character and had been placed or maintained where it exists by any act of that State a judicial remedy for its removal would be available to the State of Indiana, based upon the principles declared by the Supreme Court of the United States in the case of the State of Kansas *v.* The State of Colorado (185 U. S., 125; 206 U. S., 971).

It is but an act of simple justice to both the States that the exceptional features of the situation should be considered regardless of any technical contentions about "protection to navigation."

The improvement would be within the powers and principles announced by the Supreme Court of the United States of enabling the citizens of one State to gain access to the navigable waters that lie in another. (Gilman *v.* Philadelphia, 3 Wall., 713; South Carolina *v.* Georgia, 93 U. S., 4.)

Within these principles can be exercised all necessary powers and means of making the navigable waters below accessible from the State of Indiana though no navigation in fact of the waters above the obstruction may ever be carried on. And the further purpose of commercial regulation would be maintained. (Gibbons *v.* Ogden, 9 Wheaton, 1; Brown *v.* Houston, 114 U. S., 622; The Daniel Ball, 10 Wall., 557; Miller *v.* New York, 109 U. S., 385.)

In finding their way around this obstruction these waters occasion devastation and ruin to which the State and its citizens must submit and at the same time be denied any of the benefits of lower navigation that they have aided and continuously contributed to maintain, while other States and communities reap all the benefits. The State may not while this obstruction remains either extend or invite navigation in its own waters in which it has a proprietary interest, and its citizens are also denied the social and commercial advantages that would come from the association and exchange of commodities with citizens of a neighboring city, State, and community so often defined as being of the very essence of commerce.

To say that navigation is not protected by the utilization of upper waters of a stream that provide the sufficiency of their stage to enable navigation and without the constant use of which no lower navigation at all would be possible is but to deny an indisputable fact.

It is fair to concede that the extent of "the value of protection to navigation" is in a sense speculative and problematic, but yet the value is susceptible of fairly accurate estimation.

The cost of the construction of the necessary channels in which to collect and utilize these now spreading flood waters and the additional volume that may be brought down by reason of the drainage work now in progress and in contemplation above would be but a fair measure of the value and but a fair consideration to go to the State for its proprietary interest in them, even though it is desirous of donating them without consideration save and except to obtain the relief that will come to its deserving and long-suffering people.

The Circular 80 from the Department of Agriculture in its first pages mentions the activity of landowners in constructing drains wherever there was opportunity to reclaim or better the conditions.

These activities have at no time abated and show that the land owners are not seeking the drainage of their lands at Government expense. They are not in the attitude of mendicants in asking a proper recognition of their expenditures and sacrifices and that their work actually accomplished shall be "protected" by the only powers that can protect it.

This is in no sense merely a drainage project, but must be clearly distinguished as a measure for flood prevention occasioned by obstructions in an interstate stream, and a measure for the adjustment of the rights of two sovereign States from the adjustment of which their comity will be maintained and aid to navigation and commerce will necessarily follow.

The citizens of Momence and surrounding country in Illinois directly affected by the consequences of this work are not apprehensive of any harmful results from its becoming accomplished, and are quite unanimous in their expressions that it would be but an act of justice to Indiana and a proper means for bringing about the unity and indivisibility of people who are only separated by this obstruction. This fact is verified by their petitions to the Legislatures of Illinois for appropriations to remove it, which were responded to by their representatives to the extent of introducing measures to that end.

The Indiana landowners who were encouraged by a department of the United States Government to canalize the waters of this river and bring them to the borders of a State that they may not invade and where the laws of their own State can not operate were justified in assuming that Congress would make proper provisions for the continuation of their flowage, and the provisions it has made should receive a construction consistent with that purpose.

They are susceptible of becoming navigable from the source to the mouth of this stream by the opening of this channel and the subtlety of a mysterious science of engineering ought not to obscure their usefulness.

If words were so used in the act fixing a basis for the share that the United States should contribute for their use as to prevent any share at all being fixed, so as to obviate full cooperation with the States, and to prevent the preparation or carrying into effect of any plans and in effect to render the act entirely nugatory in the purposes aimed at, they should be disregarded entirely under the rules of legal construction, and any conclusions based on them are unworthy of confirmation.

It is finally suggested that in fairness to the "States and other communities and interests" that the matter of this investigation and the examination provided for should be recommitted to the same or other examining engineers, with instructions to consider the matters herein suggested and to proceed, with the assistance and cooperation of the executives of the States, to prepare necessary plans for the work necessary to control and conserve the waters of this river, to make proper channels for it, and to do such other work in respect to it as all the participating agencies in the

examination may find to be proper and to report the entire cost of the same and the basis upon which each of the interests benefited should contribute to pay for it in accordance with the provisions of the act providing for the examination.

This statement is offered under the invitation to parties interested and is most

Respectfully submitted.

FRANCIS M. TRISSAL,
A Northern Indiana Farmer.

DECEMBER, 1915.

LETTER OF MARION COUNTY FISH AND GAME PROTECTIVE ASSOCIATION.

INDIANAPOLIS, IND., *January 5, 1916.*

GENTLEMEN: The petition presented to the board recently by Mr. F. M. Trissal, of Chicago, relative to the drainage of the Kankakee marsh, by removal of rock at Momence, Ill., was the subject of much discussion at the last meeting of the Marion County Fish and Game Protective Association, held January 3.

The result was the following resolution, which was unanimously adopted:

"*Be it resolved*, That, as the Kankakee drainage proposition seems to be a scheme for the sole benefit of land speculators, and as it is a debatable question of the success of the project, and as this marsh is practically the only place in the State where bird life can be found in its natural environment, and as a movement is now on foot to interest the State in buying this marshland as a bird refuge and game preserve, the Marion County Fish and Game Protective Association is opposed to any action that would destroy the present wild state of the Kankakee River and marsh adjoining same."

Hoping the above will find favor, I am,

Yours, very truly,

CHARLES C. DARBY, *Secretary.*

BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

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