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MUNICIPAL WATER SUPPLIES

OF

ILLINOIS.

By EDWARD BARTOW.

WATER SURVEY SERIES No. 5.
URBANA, ILLINOIS
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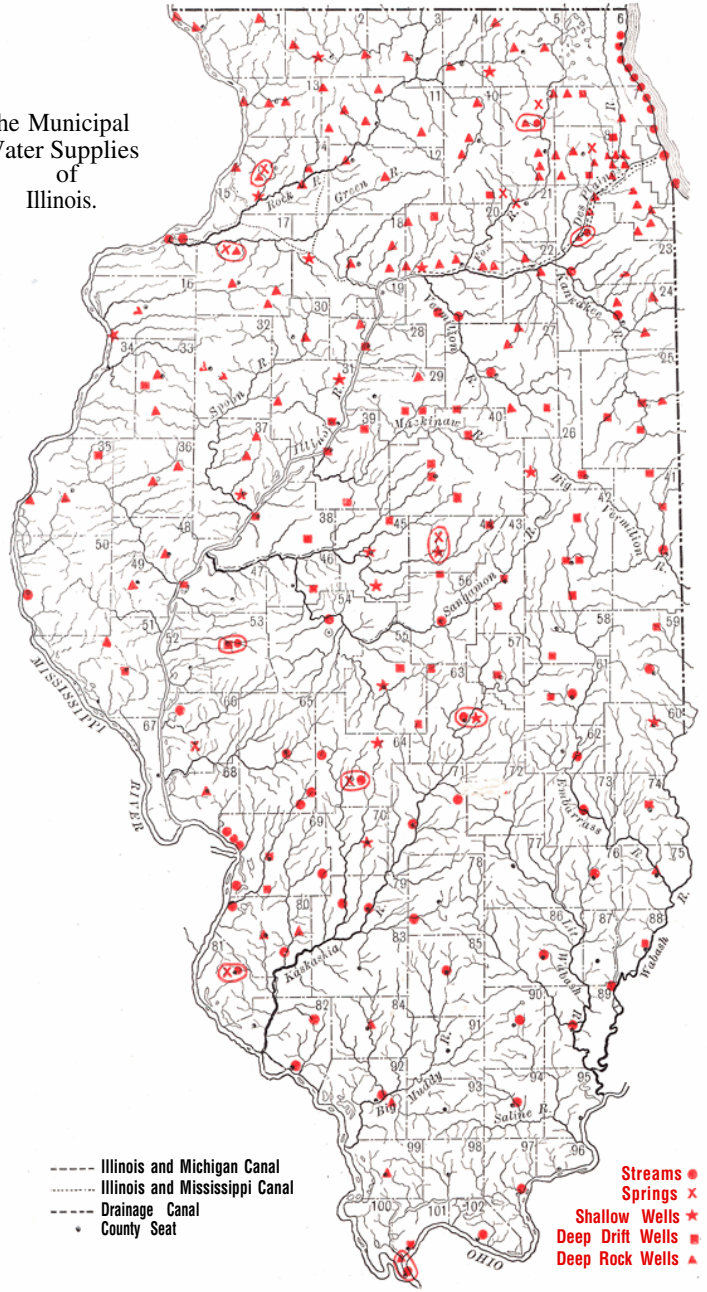
The Municipal Water Supplies of Illinois.



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STATE WATER SURVEY.

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Opal Lockwood . . . . . Stenographer

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STATE WATER SURVEY,
UNIVERSITY OF ILLINOIS,

URBANA, ILLINOIS, October 1, 1907.

Edmund Janes James, Ph. D., LL. D., President University of Illinois:

SIR—Herewith I submit a report on the Municipal Water Supplies of Illinois, and request that it be printed as a bulletin of the University of Illinois, State Water Survey, Series No. 5. It is also to be printed as a report of the State Board of Health, entitled, "Examination of the Municipal Water Supplies of Illinois." This arrangement is in accordance with the coöperative agreement between the State Board of Health and the State Water Survey, effective January 1, 1906.

It is hoped that this bulletin may serve as a basis for one more complete, that will include reports and analyses of the water from all the municipal supplies of the State.

Respectfully yours,

EDWARD BARTOW, PH. D.,
Director.

MUNICIPAL WATER SUPPLIES OF ILLINOIS.

INTRODUCTION.

For more than ten years the State Water Survey has been making analyses of the various waters used by the people of the State. The work has been carried on in accordance with an Act of the Fortieth General Assembly entitled;

"An Act to establish a chemical survey of the waters of the State of Illinois.

SECTION. 1. *Be it enactd by the People of the State of Illinois, represented in the General Assembly:* That the trustees of the University of Illinois are hereby authorized and directed to establish a chemical and biological survey of the waters of the State in connection with said university.

§ 2. It shall be the duty of the university to collect facts and data concerning the water supplies of the State; to collect samples of waters from wells, streams and other sources of supply, to subject these samples to such chemical and biological examination and analysis as shall serve to demonstrate their sanitary condition, and to determine standards of purity of drinking waters for the various sections of the State, to publish the results of these investigations in a series of reports to be issued annually, or oftener, to the end that the condition of the potable waters of the State may be better known, and that the welfare of the people of the various communities of the State may thereby be conserved."

This report contains data concerning the source of the water supplies and the quality of the water of cities which according to the census of 1900 had more than 1,000 inhabitants. The data concerning the supplies was obtained by correspondence with water works officials or city officers. Three series of letters were sent out and a direct- report, more or less complete, has been received from all but fourteen of the cities having more than 1,000 inhabitants.

In a few instances data have been taken from previous works which treat of the municipal water supplies of Illinois. In nearly every case we have confirmed the data thus taken. The works consulted are:

"Manual of American Water Works," 1897, by M. N. Baker.

"Hand-book of Water Works and Fire Department Statistics," 1903-4.

"State Board of Health Report," 1901, Sanitary Investigations of Illinois river and tributaries.

"Water Resources of Illinois," by Frank Leverett, Seventeenth annual report of the U. S. G. S. 1895-6, part 2.

"Illinois Glacial Lobe," Monograph XXXVIII U. S. G. S., 1899, by Frank Leverett.

There are also included analytical data which have been obtained by the survey since its foundation in 1897 to the end of 1906.

In these analyses problems such as the following have been studied:

1. Tests of the purity of water deliverd by water works plants.
2. Comparative tests of the waters from several possible sources for cities intending to put in a new supply, or to extend an old one.
3. Tests of the efficiency of filters by analyses of water before and after filtration.
4. The determination of the suspended matter and the soluble mineral content of streams of the State, in order to obtain data from which can be calculated the size and expense of filter plants or water sofenting plants.
5. The determination of the mineral content of well water supplies, to obtain data concerning the character of the soluble mineral content that where necessary the proper treatment for such waters may be learned.

This bulletin should serve communities of the State in various ways. It should, for example, give the cities having good supplies confidence in their water.

It should enable a city having an unsatisfactory supply to compare its supply with those that are satisfactory and determine how the unsatisfactory water can be improved.

Municipalities having no general water supply should receive an incentive to obtain such a supply as is already maintained by cities in their own class.

The analytical work reported was done under the direction of the late Professor A. W. Palmer till his death in February, 1904. From that time until September, 1905, when the present director took charge, Professor S. W. Parr was acting director. Analytical work has been done by W. G. Bain, P. Barker, A. D. Emmett, A. R. Johnston, D. Klein, J. M. Lindgren, A. L. Marsh, C. V. Millar, C. R. Rose and R. W. Stark.

The analyses of composite samples from streams were made by W. D. Collins. Mabel Bush, Opal Lockwood and L. I. Birdsall, have assisted in compiling the results.

We fear that errors will be found in our report and hope that anyone who discovers such will inform us. We hope that it may be possible in the near future to issue a revised edition that will contain statistics compiled by our own field men and to analyze and report on the character of the water from those towns from which no samples have been sent to us.

CO-OPERATION OF STATE WATER SURVEY AND STATE BOARD OF HEALTH.

In 1905 as recorded in the annual report of the State Water Survey for the year ending August 31, 1905, arrangements were completed by which the State Board of Health and the State Water Survey were to work together on problems related to the water supplies of the State. The agreement accepted by the State Board of Health and the Trustees of the University of Illinois for the State Water Survey is as follows:

For the purpose of coöperation we are dividing the water problems of the State into the following four sub-divisions:

1. Epidemics.
2. Sewage purification.
3. Water supplies.
4. Streams.

1. EPIDEMICS—The epidemics that are carried by means of water are, cholera and typhoid fever. The first at the present time is so well under control that the possibilities of a cholera epidemic in an inland state are remote. Practically the only water-borne disease to be considered would, therefore, be typhoid fever. In this coöperative agreement it is the function of the State Board of Health to investigate places where the typhoid rate is high and it is the function of the State Water Survey to analyze the samples collected by the inspector of the State Board of Health and report the same.

2. SEWAGE PURIFICATION—For the second problem the oversight of sewage disposal is a function of the State Board of Health. Through its inspectors it shall obtain the physical data and collect samples of sewage and effluent, which the State Water Survey shall analyze. In addition to inspection by the State Board of Health, the State Water Survey shall inspect plants where a special study is to be made. Either the State Board of Health or the State Water Survey should make at least an annual inspection of all sewage works and sewage systems, public and institutional.

3. WATER SUPPLIES—It is the primary function of the Water Survey to have the oversight of all the water supplies of the State. We may divide these into:

1. Municipal.
2. Institutional.
3. Individual.

1. Municipal—Statistics should be obtained regarding the source and character of all city supplies. This may be done by first writing a letter to the mayor of each city or to the superintendent of water works, to obtain preliminary data to be followed as far as possible by inspection of the water supply by a representative of the State Water Survey or of the State Board of Health. Sanitary and economic analysis should be made at regular intervals of all supplies. The interval should be determined by each individual case. For example, streams vary more than wells, hence such supplies require more frequent examinations. A study should also be made of public or community wells. These are generally located on or near the street and the possibility of contamination is very great.

2. Institutional—In some cases the institutions receive their supply from the city in which they are located. Such supplies need no special attention. In cases where the institution has its private plant arrangements should be made for periodic examination of its water supply.

3. INDIVIDUAL WELLS—The Water Survey has been making analyses for citizens of Illinois of wells and springs throughout the State. This should be continued and should be supplemented by the collection of water from wells in localities where no pollution is suspected, with the ultimate end of preparing a normal chlorine map of the State. This work must be accomplished by personal inspection of localities by a representative of the State Water Survey and personal collection of samples for shipment direct to the laboratory.

4. STREAMS—No special investigation of streams to be made under this agreement.

MUNICIPAL WATER SUPPLIES.

Large cities like Chicago employ experts whose special duty it is to make regular examinations of the water supply. Smaller cities for financial reasons rarely employ such men regularly. Outside assistance is not called for until there is complaint, and usually the examinations are made at such rare intervals that they are valueless for comparative study. For the best results, it is our belief that periodical examinations should be made of all municipal water supplies. The city of Chicago makes daily analyses of the water obtained through each of the nine intakes through which the Lake Michigan water is drawn. This is done that warning may be given without delay should signs of pollution be detected.

If a large city considers daily examinations essential, the small city should have some regular attention paid to its supply. We consider it an important function of the State Water Survey to care for the municipal supplies of the State. Under present circumstances it would be impossible to make daily examination of many supplies, nor would it be advisable.

Water obtained from streams should be analyzed at frequent intervals, weekly if possible, monthly at least. Waters coming from shallow wells may be analyzed even less frequently. Waters from deep

wells need not be analyzed more often than once a year, unless the water is stored in reservoirs where there is a possibility of contamination.

COLLECTION OF DATA.

In our attempt to collect data concerning the municipal water supplies of the State, letters and blanks have been sent to every city of more than 1,000 inhabitants. The data desired for each city or town is the following:

1. Population, and rate of increase.
2. On what branch of river system.
3. Chemical or physical character of the river water.
4. Ponds, lakes or reservoirs, and their character.
5. Ice industry.
6. Character of wells and springs.
7. Sewer system established.
8. The municipal water supply, when established.
   - Source of water, ownership, cost, changes since installation.
   - Description of reservoirs, pumping station, and pumps.
   - Daily consumption.
   - Character of the water, chemical and physical.
   - If treated, how, and at what cost.
   - If supply from wells, the geological strata, diameter and depth.
   - The annual cost of maintenance.

Our attempt has in general received the hearty coöperation of the water works and city officials. Many cities of the State have also sent in samples for analysis and several cities send regular monthly samples to our laboratory. Owing to present conditions the Water Survey has not felt justified in consenting to make more frequent regular analyses.

From some cities no reply was received from the water works superintendent or the mayor. To the postmasters of those cities we mailed a reply postal card asking:

1. Is there a general water supply?
2. What is its source?
3. Is it owned by the city or a company?

In some cases, therefore, the data obtained is very meager.

ANALYTICAL WORK.

The analytical work reported may be divided into two classes:

1. Sanitary analysis.
2. Analysis of the mineral content.
   - (a) Individual samples.
   - (b) Average samples.

1. Sanitary analyses.

Under this head are included the following:

Physical determinations.
- Turbidity.
- Color.
- Odor.

Chemical determinations.
- Total residue on evaporation.
- Chlorine in chlorides.
- Oxygen consumed.
- Organic matters.

Nitrogen as—
Albuminoid ammonia.
Free ammonia.
Nitrites.
Nitrates.
Alkalinity.
Bacterial examinations.
Number of bacteria per cubic centimeter.
Presumptive tests for the colon bacillus.

Below is given a brief explanation of their significance:

INTERPRETATION OF RESULTS OF SANITARY WATER ANALYSIS.

The statement of chemical results is made in parts per million by weight, that is in milligrams per liter, since one liter of water weighs 1,000,000 milligrams. On the scale of 100, one part is equivalent to one ten-thousandth of one per cent. Should the data be desired in terms of the United States gallon of 231 cubic inches, multiply by .058335.

"Turbidity" refers to the amount of insoluble matter in suspension. It may be perfectly harmless, though a turbid water is less attractive for drinking purposes than a perfectly clear water. The turbidity standard is silica suspended in water.

"Color" refers to colored substances in solution. It is due usually to an extract of vegetable matter. The color standard is the color obtained by a solution of platinum chloride in water, or Nessler standards.

"Odor" is a descriptive term and is reported as vegetable, fishy, moldy, disagreeable, etc.

"Total residue on evaporation" comprises the solid matters left on evaporating the water and drying the residue at 180 degrees centigrade. It includes both inorganic and organic substances. Unless the quantity is excessive or the water is to be used for industrial purposes the individual constituents are not separately determined.

"Chlorine in chlorides" refers to the quantity of chlorine in combination with metals, for example, sodium chloride (common salt). In unpolluted waters the amount of chlorine, or the "normal chlorine" varies according to location; for example, distance from the sea coast or the presence of salt deposits.

Chlorine is a constant and considerable constituent of sewage—therefore, if it is present in a water in amounts exceeding the normal for that locality, pollution is indicated.

"Oxygen consumed" refers to the quantity of oxygen required to oxidize the organic matters present in water. However, many organic substances which may be present in water are not readily affected by the oxidizing agent. Sometimes inorganic matter is oxidized, hence the quantity of "oxygen consumed" does not always bear a direct ratio to the total quantity of organic matters present.

"Organic matters." At present we have no practicable means for the accurate determination of the quantity and character of the various individual organic substances contained in water. These substances include living organisms, both vegetable and animal; products of organic life such as fecal matters, and decaying vegetation. Because nitrogen is an essential of all living things, we therefore, base the estimation of organic matters on the detrmination of nitrogen in four of the forms in which it exists in water.

"Nitrogen as albuminoid ammonia" represents the nitrogen contained in various organic substances in an undecomposed state but which will decompose under certain conditions. These substances include products of organic life, as albuminous substances, tissues, fecal matters, etc., substances which serve as nutrients for germs. The presence of much nitrogen as albuminoid ammonia usually suggests pollution with sewage or drainage from refuse animal matters.

"Nitrogen as free ammonia" so called, represents ammonia contained in the water in either the free or saline condition. It is usually formed by the natural decomposition of nitrogenous organic matters. It is the first stage of oxidation or decomposition. Its quantity ordinarily indicates the amount of organic matters which are contained in the water in a partially decomposed state. It is a constant and considerable constituent of sewage, though it must be remembered that free ammonia occurs in considerable quantity in the deep drift wells of the State.

The above combinations of nitrogen in undergoing further decomposition are further oxidized, forming nitrous and nitric acids. These acids combine with basic mineral matters forming first nitrites and finally nitrates.

"Nitrogen as nitrites." The presence of any considerable quantity of nitrous acid or nitrites in a water may indicate that decomposition by living organisms is under way. Nitrites indicate pollution, but in the case of pure deep well waters containing soluble iron salts a change of the iron to insoluble compounds causes the formation of nitrites from nitrates which may be present.

"Nitrogen as nitrates." The presence of considerable quantities of nitrogen as nitric acid or nitrates indicates that at least correspondingly large quantities of organic matter have been previously present in the water.

The danger attending the presence of organic matters in water arise chiefly from the fact that disease germs may accompany organic matters of animal origin.

"Alkalinity of water affects its value for household and industrial uses. It is measured in terms of calcium carbonate.

"Sulphates and iron" also affect the household and industrial value.

BACTERIAL EXAMINATIONS OF WATER.

"The number of bacteria" per cubic centimeter reported is the number of bacteria that will develop colonies on gelatine at 20 degrees centigrade. unless otherwise noted.

"Colon bacillus." Bacteria of the colon group are always present in the intestinal tract of men and of animals. They are therefore present in sewage and the determination of their presence or absence while not an absolute test helps in the formation of an opinion.

In the report, the amount of water used is denoted by 10 c. c.; 1.0 c. c., etc.; the number of tests made is denoted by figures directly under the amount, and the result of the tests is denoted by the plus (+) sign when the test gave a positive result and by the minus (–) sign when the result was negative.

STANDARDS OF PURITY.

For the information and convenience of those who read this report, the following limits have been provisionally adopted as a reasonable basis for reaching conclusions regarding the wholesomeness of waters in the State of Illinois. No absolute standards of purity whereby to judge the condition of any and all potable waters can be justly established, because of differences due to the nature of the strata from which waters are drawn or with which they have been in contact, the topography of the district, and the general environment of the sources.

SUGGESTED LIMITS OF IMPURITIES.

PARTS PER MILLION.

		Lake Michigan.*	Streams.**	Springs and shallow wells.	Deep drift wells.	Deep rock wells.
Turbidity		None	10.	.†None	†None	†None
Color		None	.2	†None	†None	†None
Odor		None	None	None	None	None
Residue on evaporation		130.	300.	500.	500.	500.
Chlorine		5.5	6.	15.	15.	5.–100.
Oxygen consumed		1.6	5.	2.	2.–5.††	2.–5.††
Nitrogen as	Free ammonia	.00	.05	.02	.02–3.	.02–3.
	Albuminoid ammonia	.08	.15	.05	.20	.15
	Nitrites	.000	.000	.000	.005	.000
	Nitrates	.00	.5	2.00	.50	.5
Alkalinity		.....	200.	300.	300.	300.
Bacteria per cubic centimeter		500.	500.	500.	100.	100.
Colon bacillus in one c. c.		Absent	Absent	Absent	Absent	Absent

* Analyses of water ten miles from shore of Lake Michigan. Streams Examination Sanitary District of Chicago, p. 18.

** This standard of purity is seldom found in the unfiltered water as all streams are more or less polluted.

† None when drawn from wells. They may become turbid and develop color on standing.

†† Varies as the waters contain ferrous salts.

The formation of a reasonable and just opinion regarding the wholesomeness of a water requires that there be taken into consideration all the data of the analysis together with the history of the water; the nature of the source; character of the soil and earth or rock strata, and the surroundings. The interpretation of results is a task for the expert. The purpose of this explanation is, therefore, merely to present to the layman such information as shall aid him to an understanding and appreciation of the analytical data.

II. Interpretation of results of an analysis of the mineral content of water.

When the solid residue from a water does not exceed 500 parts per million an analysis of the mineral matter is seldom required to determine its value for drinking. A water with less than 500 parts per million of any of the common natural constituents, such as salt, (NaCl), carbonate of calcium, etc., may be selected for a water supply, and while people not accustomed to such a water might at first be inconvenienced, they would soon become accustomed to its use. Metals like copper and lead, however, are poisonous and when present, even in small quantities, are harmful. The Massachusetts State Board of Health* notes that waters containing amounts of these metals as low as 0.5 parts per million have caused serious injury to health. The natural occurrence of lead or any of the heavy metals in Illinois waters would be rare. In the northwestern corner such waters might be found.

The analytical work in this report includes only the elements which are usually present in quantity and which exert an influence on the use of a water for household, laundry, boiler or manufacturing purposes.

*Report for 1898 p. XXXII.

The following elements or groups of elements (Ions) have been determined:

Potassium,	K	Nitrite,	NO_2
Sodium,	Na	Nitrate,	NO_3
Ammonium,	NH_4	Sulphate,	SO_4
Magnesium,	Mg	Chloride,	Cl
Calcium,	Ca	Silica,	SiO_2
Iron,	Fe		
Aluminium,	Al		

In some cases sodium and potassium have not been separated, but are reported as sodium. Iron and aluminium are sometimes reported as the combined oxides. Silica is determined by volatilization with hydrofluoric acid. The residue is reported as "bases," or if excessive is dissolved and the composition determined.

The significance of the various elements or groups of elements depends on the amount present and also on the other elements which accompany it. For this reason it is easier to realize the character of a water, if the metallic elements are set off against the non-metallic, or hypothetical combinations made.

In this laboratory the practice has been to make combinations, using the meatls in the order: Potassium (K), sodium (Na), ammonium (NH^4) magnesium (Mg), calcium (Ca), iron (Fe), aluminium (Al), combined with the non-metalic groups in the order: Nitrite (NO_2), nitrate (NO_3), chloride (Cl), sulphate (SO^4) and carbonate (CO^3).

It is not claimed that this represents the actual condition of the elements in the solution, but that such combinations indicate the character of the water and show the kind of treatment needed to adapt it to household, laundry, boiler or manufacturing uses.

From combinations thus made some idea can be obtained of the physiological or therapeutical action. For example, a water containing sodium sulphate, Na_2SO_4 (Glauber salt), or magnesium sulphate, $MgSO_4$ (Epsom salt), in quantity would have a laxative effect, especially on those not accustomed to its use.

For household and laundry uses there should not be an excessive quantity of any salts of magnesium or calcium, because of the large amount of soap consumed by them. Such salts will also form scale on the tea kettles and fill up the water backs in hot water heaters. Considerable amounts of salts of sodium or potassium may be present without detriment.

For boiler and manufacturing uses the character of the mineral content is of vital importance. An excessive amount of any salt is harmful. Salts of potassium and sodium in quantity cause foaming, especially in locomotive boilers. Magnesium or calcium combined as nitrates or chlorides cause corrosion or pitting and form a scale, while if combined as sulphates or carbonates they cause only the formation of a scale.

An analysis of the mineral content enables one to determine the method of treatment needed. Many boiler compounds are on the market. They should, however, be used only after analysis and in quantity to correspond to the amount of the substances to be removed.

So many of the municipal supplies of Illinois would be improved for boiler use by treatment that a word regarding methods of treatment should be in order.

Water may be treated inside or outside the boiler, and may be treated by the addition of chemicals or by simply heating it.

The carbonates of calcium and magnesium are held in solution by carbonic acid. When the water is heated the carbonic acid is driven off and the carbonate is thrown out of solution. If this occurs in the boiler, the carbonate is thrown down as a sludge or may form a soft scale. Feed water heaters remove a large amount of carbonates and are to be recommended for such waters.

The carbonic acid may be neutralized by lime, sodium hydroxide or sodium carbonate and the carbonates precipitated as a sludge. Lime must not be added to the boiler, as it doubles the amount of the sludge formed.

Sodium hydrate or sodium carbonate may be added to the boiler with the feed water. For waters containing calcium and magnesium as carbonates and no sulphates a small amount of either will last a long time, as they are changed to the acid carbonate by the reaction with the acid carbonates of calcium and magnesium and on heating the carbon dioxide is given off and sodium carbonate is regenerated.

Waters containing the sulphates of calcium and magnesium cause the formation of a hard scale. When these are present in a water, lime will have no favorable action on them. Sodium carbonate forms the insoluble calcium carbonate, and sodium hydrate forms the insoluble magnesium hydrate; or sodium carbonate and lime used together form sodium hydrate and the magnesium is precipitated as hydrate.

Suspended matter enters the scale. It is removed with the precipitate in treatment outside the boiler and with the sludge in inside treatment.

There are other chemicals which may be used in water treatment, among which may be mentioned barium hydrate, tannin, sugar and trisodium phosphate.

II (b). Mineral content of average samples from streams.

The Division of Hydrography of the United States Geological Survey has been making a study of the quality of water in streams throughout the United States. The work in Illinois was done under a coöperative agreement* between the Geological Survey, the State Geological Survey, the Engineering Experiment Station of the University of Illinois and the State Water Survey.

Samples were collected daily from twenty-seven stations on the principal streams within the State and sent to the laboratory of the State Water Survey for analysis. Ten samples were compounded and an analysis made of the composite sample. Through the courtesy of Mr. M. O. Leighton, chief hydrographer of the United States Geological Survey and the Board of Control, we are publishing the results obtained at points where the streams are now used for water supplies. The results will be published in full as a water supply and irrigation paper of the United States Geological Survey.

DESCRIPTION OF THE MUNICIPAL WATER SUPPLIES OF ILLINOIS.

There are shown to be 227 cities and villages having a general water supply. Eleven of these obtain their supplies from other cities, as shown below:

Averyville,	from Peoria	Ridgely,	from Springfield
Germantown,	from Danville	Rock Falls,	from Sterling
Glencoe,	from Winnetka	Venice,	from Granite City
Madison,	from Granite City	Wilmette,	from Evanston
North Peoria,	from Peoria	Winstanley Park,	from East St. Louis.
Pullman,	from Chicago		

This leaves 216 separate sources of supply. These have been classified according as they are derived from streams, springs, shallow wells (less than fifty feet deep), deep wells in drift and deep wells in rock. These have been plotted on a map (see frontispiece). Following a suggestion of Mr. Charles L. Burdick,† it is interesting to note that the larger part of the supplies north of a line drawn from Quincy to the point where the Indiana state line touches Lake Michigan are from deep rock wells. Between this line and a line drawn from just below St. Louis to Danville, we find the deep drift wells predominate, and south of the second line practically all are surface supplies.

There are in the State ninety-nine cities supplied from deep wells in rock, fifty-one from deep wells in drift, seventeen from shallow wells, ten from springs and sixty from streams, lakes or ponds.

*University of Illinois Bulletin Water Survey, Series No. 3, p. 19.
†Trsnsactions Illinois Society Engineers and Surveyors.

The following summaries show the origin of the different municipal supplies, while below is given in detail the data which we have concerning each:

CITIES WHICH DERIVE THEIR SUPPLIES FROM DEEP ROCK WELLS.

Aledo,
Amboy,
Aurora,
Barrington,
Barry,
Batavia,
Belleville,
Belvidere,
Blue Island,
Bradley,
Bushnell,
Byron,
Cairo,
Cambridge,
Canton,
Carbondale,
Carbon Hill,
Carthage,
Chicago Heights,
DeKalb,
DesPlaines,
Dixon,
Dolton Station,
Dwight,
Earlville,
East Dubuque,
Elgin,
Elmwood,
Falrbury,
Farmington,
Forreston,
Fulton,
Galena,
Galesburg,
Galva,
Geneseo,
Geneva,
Genoa,
Harvard,
Harvey,
Henry,
Hinsdale,
Jerseyville,
Joliet,
Jonesboro,
Kewanee,
Knoxville,
Ladd,
LaGrange,
Lanark,
Lawrenceville,
Lemont,
Lena,
Lockport,
McHenry,
Macomb,
Mascoutah,
Maywood,
Melrose Park,
Mendota,
Minonk,
Momence,
Monmouth,
Morgan Park,
Morris,
Morrison,
Mount Carroll,
Mount Morris,
Mount Sterling,
Naperville,
Odell,
Ottawa,
Palatine,
Park Ridge,
Pecatonica,
Peotone,
Peru,
Pinckneyville,
Polo,
Princeton,
River Forest,
Riverside,
Rochelle,
Rockford,
Roseville,
Rushville,
St. Anne,
Savanna,
Seneca,
Sheldon,
Spring Valley,
Sterling,
Sycamore,
Warren,
Warsaw,
West Chicago,
Wheaton,
Woodstck,
Wyoming,

CITIES WHICH DERIVE THEIR SUPPLIES FROM DEEP WELLS IN DRIFT.

Arcola,
Arlington Heights,
Atlanta,
Beardstown,
Bement,
Bloomington,
Champaign,
Chatsworth,
Chenoa,
Chrisman,
Collinsville,
Delavan,
Downers Grove,
Edwardsville,
El Paso,
Eureka,
Farmer City,
Havana,
Hoopeston,
Jacksonville,
Kangley,
Kirkwood,
Lacon,
La Harpe,
Le Roy,
Lexington,
Maroa,
Marseilles,
Mason City,
Mattoon,
Milford,
Monticello,
Mound City,
Moweaqua,
Normal,
Pana,
Paxton,
Pekin,
Peoria,
Petersburg,
Pittsfield,
Rantoul,
Robinson,
Rossville,
Sandwich,
Stonington,
Tolono,
Urbana,
Washington,
Watseka,

CITIES WHICH OBTAIN THEIR SUPPLIES FROM SHALLOW WELLS.

Casey,
Chillicothe,
Clinton,
Freeport,
Gibson City,
Greenville,
Keithsburg,
LaSalle,
Lewistown,
Lincoln,
Marengo,
Mt. Pulaski,
Nokomis,
Prophetstown,
Sheffield,
Shelbyville,
Taylorville,

CITIES WHICH OBTAIN THEIR SUPPLIES FROM SPRINGS.

Carrolton,
Clinton,
East Dundee,
Elmhurst,
Geneseo,
Hillsboro,
Morrison,
Plano,
Waterloo,
Yorkville,

CITIES WHICH OBTAIN THEIR SUPPLIES FROM RIVERS, LAKES OR PONDS.

Alton,
Breese,
Cairo,
Carlinville,
Carlyle,
Carmi,
Centralia,
Charleston,
Chester,
Chicago,
Danville,
Decatur,
East St. Louis,
Effingham,
Elgin,
Evanston,
Fairfield,
Ft. Sheridan,
Freeburg,
Golconda,
Granite City,
Grayville,
Greenup,
Harrisburg,
Highland,
Highland Park,
Hillsboro,
Jacksonville,
Joliet,
Kankakee,
Lake Forest,
Litchfield,
McLeansboro,
Metropolis,
Moline,
Mt. Carmel,
Mt. Olive,
Mt. Vernon,
Murphysboro,
Newton,
North Chicago,
Olney,
Paris,
Pontiac,
Quincy,
Rock Island,
St. Elmo,
Shelbyville,
Sparta,
Springfield,
Staunton,
Streator,
Upper Alton,
Vandalia,
Waterloo,
Waukegan,
West Hammond,
White Hall,
Wilmington,
Winnetka,

CITIES WHICH HAVE SUPPLIES FROM TWO DIFFERENT SOURCES.

Cairo, Ohio river and deep rock wells.
Clinton, springs and shallow wells.
Elgin, Fox river and deep rook wells.
Geneseo, springs and deep rock wells.
Hillsboro, springs and reservoir.
Jacksonville, deep drift wells and creek.
Joliet, creek and deep rock wells.
Morrison, spring and deep rock well.
Shelbyville, river and shallow wells.
Waterloo, springs and creek.

CITIES WHICH HAVE NO GENERAL SUPPLY.

Albion,
Altamont,
Anna,
Ashland,
Assumption,
Astoria,
Athens,
Auburn,
Augusta,
Benton,
Braceville,
Brooklyn,
Bunkerhill,
Camp Point,
Carpentersville,
Carterville,
Cerro Gordo,
Coal City,
Cobden,
Colchester,
Colfax,
Columbia,
Creal Springs,
Cuba,
DuQuoin,
Edinburg,
Eldorado,
Flora,
Gardner,
Girard,
Greenfield,
Griggsville,
Hamilton,
Herrin,
Homer,
Johnson City,
Kansas,
Lebanon,
Marisa,
Martinsville,
Millstadt,
Nashville,
Nauvoo,
Neoga,
Newman,
Nilwood,
Oakland,
Odin,
O'Fallon,
Oquawka,
Redbud,
Riverton,
St. Charles,
Salem,
Sandoval,
Shawneetown,
Sumner,
Toulon,
Trenton,
Troy,
Vermont,
Vienna,
Virginia,
Waverly,
Winchester,

DATA CONCERNING MUNICIPAL SUPPLIES.

Abingdon, Knox county (2022), has sent no report.

Albion, Edwards county (1162), has no general supply.

Aledo, Mercer county (2081), obtains its water supply from a well 3,165 feet deep. For sanitary analysis, see final table.

Altamont, Effingham county (1335), has no general supply.

Alton, Madison county (14210), is situated on the Mississippi river. The water supply is obtained from the river. The water is treated with lime and iron sulphate and filtered. The system was established in 1898 and is owned by a company. For sanitary analysis, see final table.

Amboy, Lee county (1826), is located on the Green river. The water supply is obtained from a six-inch artesian well, 2,208 feet deep. The system is owned by the city and was built in 1895 at a cost of $12,000.00. The pump is of the Gould type, and has a capacity of 450 gallons per minute. The daily consumption is 80,000 gallons.

For sanitary analysis see special table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 2929, NOV. 10, 1897.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S.Gallon
Potassium, K	2.8	Potassium nitrate,	KNO_3	3.6	0.21
Sodium, Na	13.7	Potassium chloride,	KCl	1.1	0.06
Ammonium, NH_4	0.9	Potassium sulphate,	K_2SO_4	1.9	0.11
Magnesium, Mg	34.9	Sodium sulphate,	Na_2SO_4	9.0	0.52
Calcium, Ca	86.3	Sodium carbonate,	Na_2CO_3	14.1	0.82
Ferrous, Fe	1.6	Ammonium carbonate,	$(NH_4)_2CO_3$	2.5	0.14
Aluminium, Al	7.1	Magnesium carbonate,	$MgCO_3$	125.2	7.30
Silicon, Si	6.5	Calcium carbonate,	$CaCO_3$	212.6	12.39
Nitrate, NO_3	2.2	Ferrous carbonate,	$FeCO_3$	3.2	0.18
Chloride, Cl	0.5	Alumina,	Al_2O_3	1.9	0.11
Sulphate, SO_4	7.7	Silica,	SiO_2	13.8	0.80
		Total		388.9	23.64

Anna, Union county, (2618), has no municipal water supply. Deep wells are used by larger manufacturers.

Arcola, Douglas county (1995), is situated about three miles from the Okaw river. The water supply is obtained from three deep wells. The system is owned by the city and was established in 1890. There are two small pumps and one large lift pump. The system includes a stand tower.

Arlington Heights, Cook county (1380, estimated 2500)), is putting in a general water supply, to be owned by the village. The water is from wells

Ashland, Cass county (1201), has no general supply.

Assumption, Christian county (1702), has no general supply.

Astoria, Fulton county (1684), has no general supply.

Athens, Menard county (1535), is situated two and one-half miles from the Sangamon river. There is a public well with wind mill and tanks. An attempt to sink an artesian well about the year 1895 failed, for a flow of salt water not fit for municipal use was struck at 2,400 feet.

Atlanta, Logan county (1270), has sent no recent report.

According to Leverett,* the supply for the water works is obtained from wells 151 feet deep.

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF ATLANTA

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
								Ammonia.			
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
1293	Aug. 19, 1896	Distinct	.8	000	492.8	4.1	6.2	4.00	.180	.000	.08
1294	do	do	.8	000	607.6	21.0	6.4	3.84	.200	.000	.10
1295	do	do	.8	000	562.4	17.0	6.4	4.00	.240	.000	.10
1296	do	do	.8	000	572.0	16.	7.3	4.00	.200	.000	.10
3718	Aug. 25, 1896				289.6						
3719	Aug. 26, 1896	Distinct	.4	000	344.8	18.	13.4	.24	.440	.150	1.70

Analyses of the mineral content of the city water, sent by the city clerk, show the following results:

LABORATORY NO. 3718 AND 3719. JUNE 22, 1898.

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Parts Per U. S. Gallon.	
	3718	3719			3718	3719	3718	3719
Potassium, K	3.5	3.6	Potassium nitrate,	KNO_3	1.1	1.1	0.06	0.06
Sodium, Na	31.2	32.1	Potassium chloride,	KCl	5.8	6.0	0.33	0.35
Ammonium, (NH_4)	4.4	4.5	Sodium chloride,	NaCl	3.3	4.1	0.19	0.23
Magnesium, Mg	43.1	45.7	Sodium sulphate,	Na_2SO_4	26.8	35.3	1.56	2.06
Calcium, Ca	97.1	93.9	Sodium carbonate,	Na_2CO_3	48.9	44.7	2.85	2.60
Ferrous, Fe	3.8	3.1	Ammonium carbonate,	$(NH_4)_2SO_4$	11.7	11.9	0.68	0.70
Aluminium, Al	0.7	1.3	Magnesium carbonate,	$MgCO_3$	150.1	159.2	8.75	9.29
Silicon, Si	9.3	8.4	Calcium carbonate,	$CaCO_3$	242.5	234.6	14.14	13.68
Nitrate, NO_3	0.7	0.7	Ferrous carbonate,	$FeCO_3$	7.7	6.4	0.45	0.37
Chloride, Cl	4.8	5.2	Alumina,	Al_2O_3	1.3	2.4	0.07	0.14
Sulphate, SO_4	18.1	23.8	Silica,	SiO_2	19.8	17.8	1.15	1.04
			Total		512.0	523.5	30.23	30.52

Auburn, Sangamon county (1281), has no general water supply.

Augusta, Hancock county (1149), has no general supply.

Aurora, Kane county (24,147, estimated 28,000), is situated on the Fox river. The water works are owned by the city. The water supply is obtained from wells using air lifts. There is one Nordburg triple expansion and two Dean compound pumps of 5,000,000 gallons capacity. The system includes a stand pipe, 18x155 feet. The plant was installed in 1886 at the cost of $137,000. River water was first used, but was given up for deep well water, owing to impurities. North Aurora, Batavia, Geneva, St. Charles, Coleman, South Elgin and Elgin are all located on the Fox river within twenty-two miles of Aurora and empty their sewage into the Fox river.

*U. S. Geol. Survey, Monograph XXXVIII.

For sanitary analysis see following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF AURORA.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
								ammonia.			
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
3919.....	Aug. 7,1898	Slight.....	.04	000	228.8	5.	5.2	.02	.16	.000	.30
3920.....	..do.....	..do.....	.03	000	454.4	95.0	1.7	.358	.012	.000	.3
8573.....	Sept. 28,1900	..do.....	.14	000	297.6	11.	7.7	.114	.256	.000	.48
8646.....	Oct. 9,1900	Distinct.....	.2	000	458.0	104.	1.3	.023	.014	.006	.154
9097.....	.....	Very decided..	Red	000	.....	.....	.....	.....	.....	.003	.317
9461.....	Oct. 9,1901	Slight.....	.03	000	596.8	183.	4.0	.336	.014	.001	.08
9692.....	Nov. 7,1901	..do.....	.2	Put'd	295.2	6.8	8.3	.144	.368	.034	.646
9693.....	..do.....	..do.....	.1	000	356.4	40.0	4.8	.244	.184	.004	.24
9694.....	..do.....	Distinct.....	.1	000	724.0	270.0	4.6	.376	.010	.000	.087
10624.....	Sept. 17,1902	..do.....	.1	000	469.6	93.0	4.2	.048	.136	.000	.24
10724.....	Oct. 28,1902	..do.....	.3	000	472.4	3.15	10.4	.064	.336	.003	.397

The determination of the mineral content gave results as follows:

LABORATORY NO. 10724. OCT. 28, 1902.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	14.6	Potassium nitrate,	KNO_3	0.9	0.05
Sodium, Na	73.6	Potassium chloride,	KCl	27.3	1.60
Magnesium, Mg	15.4	Sodium chloride,	NaCl	181.7	10.60
Calcium, Ca	66.2	Sodium sulphate,	Na_2SO_4	4.1	0.24
Ferrous, Fe	0.8	Magnesium sulphate	$MgSO_4$	35.4	2.06
Aluminium, Al	0.4	Magnesium carbonate,	$MgCO_3$	35.1	2.05
Silicon, Si	2.9	Calcium carbonate,	$CaCO_3$	165.0	9.62
Nitrate, NO_3	0.6	Ferrous carbonate,	$FeCO_3$	1.6	0.09
Sulphate, SO_4	31.0	Alumina,	Al_2O_3	0.8	0.05
Chloride, Cl	122.5	Silica,	SiO_2	6.2	0.36
		Total		458.1	26.72

Averyville, Peoria county (1573), is located on the Illinois river. The water supply is obtained from the Peoria Water Company. The wells are located in Averyville. For sanitary analysis, see the following table.

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF AVERYVILLE.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
								ammonia.			
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
2254	May 24,1897	None	.03	000	428.0	27.	1.1	.000	.032	.000	2.3
3244	Feb. 7,1898	Very slight ...	.02	000	540.	39.	3.0	.028	.116	.004	1.0
11109	May 27,1903	Distinct	.....	000	416.0	20.	2.4	.600	.032	.000	.2
13604	Sept. 27,1905	Decided	.4	000	447.0	4.1	2.45	.048	.042	.000	.12
13605	..do.....	..do.....	.4	000	448.0	5.5	1.95	.056	.048	.000	.12
13606	..do.....	..do.....	.4	000	448.0	4.3	1.95	.136	.054	.000	.08

The analysis of the mineral content is as follows:

LABORATORY NO. 2254. MAY 24, 1897.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	4.1	Potassium nitrate,	KNO_3	10.6	0.61
Sodium, Na	29.3	Sodium nitrate,	$NaNO_3$	5.0	0.29
Magnesium, Mg	12.1	Sodium chloride,	NaCl	44.6	2.60
Calcium, Ca	109.3	Sodium sulphate,	Na_2SO_4	41.3	2.40
Silicon, Si	6.8	Magnesium sulphate,	$MgSO_4$	55.1	3.21
Nitrate, NO_3	10.2	Magnesium carbonate,	$MgCO_3$	3.5	0.20
Chloride, Cl	2.7	Calcium carbonate,	$CaCO_3$	272.6	15.91
Sulphate, SO_4	71.7	Oxides of iron and aluminium	$Fe_2O_3 + Al_2O_3$	1.6	0.05
		Silica	SiO_2	14.4	0.84
		Total		449.0	26.11

Barrington, Cook county, (1162) obtains its water supply from a well 508 feet deep. The system is owned by the city and was established in 1898.

Barry, Pike county, (1643) has a well about 2,500 feet deep with a water tank at an elevation of 90 feet. The tank is kept filled by a steam pump and the water furnishes fire protection to the business district. The water is said to be alkaline and its strong taste makes it unpleasant to most people. It is extensively used for bath rooms, stables and lawn and street sprinkling. Most of the people obtain their water from bored wells at a depth of from 60 to 80 feet.

Batavia, Kane county (3871), located on the Fox river, obtains its water supply from a well about 1,300 feet deep. The system is owned by the city.

Beardstown, Cass county (4,827), is located on the Illinois river. The water supply is from wells 90 to 100 feet deep, located about one mile from the center of the city. The system was established in 1892 at a cost of $40,000. The pumps are Westinghouse and have a capacity of 1,500,000 per day. Daily consumption, 1,000,000 gallons.

Belleville, St. Clair county (17,484), is located on Richland creek. The water supply is obtained from wells 500 to 1,500 feet deep, owned by the Deep Well Company. The pumping station is located one-half mile south of the city. The system was established in 1890 at a cost of $350,000. The daily consumption is 600,000 gallons. The supply was originally obtained from lakes, which source is used at the present time by the railroads.

For sanitary analysis, see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF BELLEVILLE.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.	
								Free.	Albuminoid.			
1450	Oct. 6,1896	Distinct . . .	.7	000	176.8	3.8	7.50	.036	.440	.022	.70	.....
1456	.. do.	Slight	.02	000	239.6	3.2	4.8	.024	.288	.000	.14	.....
1457	.. do.	.. do.	.02	000	148.0	3.3	5.6	.030	.084	.009	.15	.....
5228	June 14,1899	.. do.	.2	000	352.8	16.0	2.4	.000	.080	.000	.56	.....
5324	July 30,1899	.. do.	.02	000	412.8	36.0	1.6	.090	.050	.038	.16	.....
5325	.. do.	Distinct . . .	.04	000	330.8	17.5	2.75	.016	.094	.072	.32	.....
5326	.. do.	.. do.	.05	000	334.4	17.0	2.55	.010	.068	.011	.28	.....
13800	Dec. 5,1905	Clear	.00	2 Earthy .	417.0	18.0	2.05	.052	.026	.001	.28	323.4
13801	.. do.	.. do.	.00	2 Earthy .	424.0	17.5	1.45	.124	.126	.007	.24	315.6
13802	.. do.	Faint	.00	2 Musty . .	435.0	18.0	2.00	.056	.094	.017	.16	337.2
14755	Aug. 10,1906	Clear	.00	000	425.0	17.0	1.95	.034	.065	.003	.28	325.9
14756	.. do.	.. do.	.00	000	426.0	19.0	1.7	.006	.060	.000	.44	328.0
14757	.. do.	.....	.00	000	439.0	19.5	1.65	.926	.068	.000	.28	331.0
14782	.. do.	Clear	.00	Keros'ne	425.0	20.0	2.0	.028	.090	.019	.28	324.0

Belvidere, Boone county (6937), situated on the north branch of the Kishwaukee river, obtains its supply from a well 1,920 feet deep. According to Leverett,* this well is cased only to the limestone and draws its water from several horizons. For sanitary analysis, see final table. An analysis of the mineral content gave the following results:

LABORATORY NO. 5977. SEPT. 29, 1899.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	2.7	Potassium nitrate,	KNO_3	2.6	.15
Sodium, Na	8.0	Potassium chloride,	KCl	3.3	.19
Ammonium, (NH_4)	.4	Sodium chloride,	NaCl	8.9	.52
Magnesum, Mg	33.8	Sodium sulphate,	Na_2SO_4	13.9	.81
Calcium, Ca	77.4	Ammonium sulphate,	$(NH_4)_2SO_4$	1.4	.08
Ferrous, Fe	.15	Magnesium sulphate,	$MgSO_4$	1.5	.09
Aluminium, Al	.16	Magnesium carbonate,	$MgCO_3$	116.5	6.80
Silicon, Si	4.8	Calcium carbonate,	$CaCO_3$	193.4	11.28
Nitrate, NO_3	1.6	Ferrous carbonate,	$FeCO_3$	.3	.02
Chloride, Cl	7.	Alumina,	Al_2O_3	.3	.02
Sulphate, SO_4	11.6	Silica,	SiO_2	10.3	.59
		Total		352.4	20.55

Bement, Piatt county (1484), obtains its water supply from two six-inch wells 141 feet deep. The water system is owned by the city and was established in 1894 at a cost of $140,000. A small reservoir of 40,000 gallons capacity is located at the pumping station in the east part of the city. There are two Fairbanks pumps of 120,000 gallon daily capacity. The daily consumption is 30,000 gallons. For sanitary analysis see final table.

Benton, Franklin county (1,341), has no municipal water supply.

Berwyn, Cook county (1796), obtains its water supply from a well 1,570 feet deep. For sanitary analysis see final table.

*U. S. Geol. Surv., monograph XXXVIII. p. 573.

The determination of the mineral content gave the following results:

LABORATORY No. 12159, JUNE 17, 1904.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	26.3	Potassium nitrate,	KNO_3	1.0	.06
Sodium, Na	79.9	Potassium chloride,	KCl	44.2	2.57
Magnesium. Mg	39.4	Sodium chloride,	NaCl	103.0	6.01
Calcium, Ca	102.1	Sodium sulphate,	Na_2SO_4	121.1	7.06
Oxide of Iron, Fe_2O_3 and alumina, Al_2O_3	2.5	Magnesium sulphate,	$MgSO_4$	182.4	10.63
		Magnesium carbonate,	$MgCO_3$	9.7	.56
Nitrate, NO_3	2.4	Calcium carbonate,	$CaCO_3$	256.8	14.98
Chloride, Cl	83.5	Oxide of iron,	Fe_2O_3	2.5	.14
Sulphate, SO_4	239.7	and Alumina,	Al_2O_3		
Silica, SiO_2	14.4	Silica,	SiO_2	14.4	.84
		Total		735.1	42.85

Bloomington, McLean county (23,286, estimated 35,000), obtains its water supply from driven wells 100 feet deep. The system is owned by the city and was established in 1875 at a cost of $100,000. The pumps are Blake duplex of 2,000,000 capacity and Worthington compound condensing of 4,000,000 capacity. The daily consumption is 1,750,000 gallons.

Blue Island, Cook county (6114), obtains its water supply from artesian wells 1,800 and 2,200 feet deep. The system is owned by the city.

Braceville, Grundy county (1669), has no general water supply.

Bradley, Kankakee county (1518), is supplied by deep rock wells and in emergency by Kankakee Water Company.

Braidwood, Will county (3279), obtains its water supply from wells. The system is owned by the city.

Breese, Clinton county (1571), is located on Shoal creek. The water supply is taken from the creek. The system is owned by the Breese Water and Improvement Company and is leased to the city. It was established in 1902 at a cost of $15,000. The daily consumption is 250,000 gallons.

Brooklyn, St. Clair county (1019), has no general water supply.

Bunker Hill, Macoupin county (1279), has no general water supply.

Bushnell, McDonough county (2490), obtains its water supply from a well 1,351 feet deep. The system is owned by the city and was established in 1890. For sanitary analysis see final table.

Analysis of the mineral content is as follows:

LABORATORY No. 3570, MAY 12, 1898.

Ions.	Parts per Million.	Hypothetical Combinations.		Parts Per Million.	Grain Per U.S. Gal.
Potassium, K	26.1	Potassium nitrate,	KNO_3	1.8	.10
Sodium, Na	475.6	Potassium chloride	KCl	48.5	2.83
Ammonium, NH_4	1.55	Sodium chloride	NaCl	608.	35.46
Magnesium, Mg	49.6	Sodium sulphate	Na_2SO_4	729.2	42.53
Calcium, Ca	112.0	Ammonium sulphate	$(NH_4)_2SO_4$	6.0	.35
Ferrous, Fe	3.8	Magnesium sulphate	$MgSO_4$	228.0	13.29
Aluminium, Al	9.4	Magnesium carbonate	$MgCO_3$	16.4	.95
Silicon, Si	44.7	Calcium carbonate	$CaCO_3$	279.8	16.32
Nitrate, NO_3	1.1	Ferrous carbonate	$FeCO_3$	8.0	.46
Chloride, Cl	392.0	Alumina	Al_2O_3	17.8	1.04
Sulphate, SO_4	680.0	Silica	SiO_2	95.0	5.54
			Total	2,038.5	118.87

Byron, Ogle county (1015), is located on Rock river. The water supply is obtained from an artesian well. The water works are owned by the city and were established in 1900 at a cost of $15,000. The pump is a Demming triple, having a capacity of 300 gallons per minute. Daily consumption is about 25,000 gallons. For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 9074, APRIL 13, 1901, AND 9235, JULY 29, 1901.

Ions	Parts Per Million.		Hypothetical Combinations.	Parts Per Million.		Grain Per U.S. Gal.	
	9,074	9,235		9,074	9,235	9,074	9,235
Potassium, K	4.9	5.6	Potassium nitrate, KNO_3	.6	.9	.03	.05
Sodium, Na	6.3	5.6	Potassium chloride, KCl	8.6	10.0	.50	.58
Ammonium, (NH_4)	.06		Potassium sulphate, K_2SO_4	.4		.02	
Magnesium, Mg	36.2	33.4	Sodium Chloride, NaCl		2.1		.12
Calcium, Ca	54.4	57.1	Sodium sulphate, Na_2SO_4	19.5	14.9	1.13	.87
Ferrous, Fe	.3		Ammonium carbonate, $(NH_4)_2CO_3$	.2		.01	
Alluminium, Al	.16		Magnesium sulphate, $MgSO_4$		4.0		.23
Silicon, Si	4.2	2.3	Magnesium carbonate, $MgCO_3$	125.8	112.8	7.30	6.57
Nitrate, NO_3	.3	.6	Calcium carbonate, $CaCO_3$	135.9	142.9	7.88	8.33
Chloride, Cl	4.1	6.0	Ferrous carbonate, $FeCO_3$	.6		.03	
Sulphate, SO_4	13.4	13.3	Alumina, Al_2O_3	.3		.02	
			Oxide of iron and aluminium, Fe_2O_3 Al_2O_3		3.8		.22
			Silica, SiO_2	9.0	5.0	.52	.29
			Total	300.9	296.4	17.44	17.26

Cairo, Alexander county (12,566), is located at the junction of the Ohio and Mississippi rivers. The water supply is obtained from the Ohio river and wells. For sanitary analysis of Ohio river see final table.

The analysis of the mineral contents of the Ohio river is as follows:

LABORATORY NO. 4879. MARCH 29, 1899.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	7.9	Sodium nitrate,	$NaNO_3$	4.5	0.26
Magnesium, Mg	5.9	Sodium chloride,	NaCl	5.3	0.30
Calcium, Ca	15.8	Sodium sulphate,	Na_2SO_4	14.6	0.85
Nitrate, NO_3	3.4	Magnesium sulphate,	$MgSO_4$	7.3	0.42
Sulphate, SO_4	15.7	Magnesium carbonate,	$MgCO_3$	21.4	1.23
		Calcium carbonate,	$CaCO_3$	47.4	2.75
		Oxide of iron and alumina,	$Fe_2O+_3Al_2O_3$	23.6	1.38
		Silica,	SiO_2	7.3	4.20
		Clay and silicious matter,		103.5	6.03
		Total		234.9	17.42

Cambridge, Henry county (1345), obtains its water supply from a well 1,325 feet deep. The water is drawn from the St. Peter sand stone. For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 2102. APRIL 9, 1897.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon
Potassium, K	13.5	Potassium nitrate,	KNO_3	1.3	0.07
Sodium, Na	292.5	Potassium chloride,	KCl	24.9	1.45
Magnesium, Mg	19.7	Sodium chloride,	NaCl	265.7	15.50
Calcium, Ca	43.0	Sodium sulphate,	Na_2SO_4	524.0	30.56
Ferrous, Fe	0.50	Sodium carbonate,	Na_2CO_3	49.0	2.86
Aluminium, Al	1.6	Magnesium carbonate,	$MgCO_3$	68.6	4.00
Silicon, Si	4.5	Calcium carbonate,	$CaCO_3$	104.9	6.11
Nitrate, NO_3	0.8	Ferrous carbonate,	$FeCO_3$	1.0	0.06
Chloride, Cl	161.0	Alumina,	Al_2O_3	3.2	0.18
Sulphate, SO_4	353.8	Silica,	SiO_2	9.6	0.56
		Total		1052.2	61.35

Camp Point, Adams county (1260), has no general water supply.

Canton, Fulton county (6564), obtains its water supply from an artesian well 1650 feet deep. The system is owned by the city and was established in 1880 at a cost of $100,000. For sanitary analysis see following table.

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF CANTON.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.	Alkalinity.
		Turbidity.	Color.	Odor.				Free.	Albuminoid.			
3859	July 21, 1898	Slight.....	.02	000	1582.0	245.0	2.00	.880	.010	.005	.30	.....
3912	Aug. 3, 1898	..do.....	.04	000	1581.6	245.0	2.20	1.200	.014	.012	.12	.....
11590	Nov. 11, 1898	Very slight . . .	.00	000	1740.4	271.25	3.60	.592	.012	.006	.714	.....
11625	Nov. 21, 1898	..do.....	.....	.....	1754.0	262.5	4.50	.248	.008	.010	.79	.....
12584	Oct. 21, 1904	..do.....	.00	000	1766.0	246.0	2.00	.284	.048	.020	.78	.....
14625	July 13, 1906	Clear.....	.0	0	1820.0	275.0	4.85	.720	.072	.001	.24	215.
14746	Aug. 7, 1906	..do.....	.0	0	1892.0	285.0	4.2	.456	.042	.001	.24	225.0

An analysis of the mineral content gave the following results:

LABORATORY NO. 3912, AUG. 3, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Milliion.	Grains Per Gallon.
Potassium, K	25.3	Potassium nitrate,	KNO_3	.9	.05
Sodium, Na	338.9	Potassium chloride,	KCl	47.7	2.78
Ammonium (NH_4)	1.6	Sodium chloride,	NaCl	366.3	21.36
Magnesium, Mg	38.6	Sodium suphate,	$Na_2 SO_4$	601.1	35.06
Calcium, Ca	95.9	Ammonium sulphate,	$(NH_4)_2 SO_4$	5.8	.33
Ferrous, Fe	.8	Calcium sulphate,	$CaSO_4$	121.2	7.70
Aluminium, Al	1.8	Calcium carbonate,	$CaCO_3$	149.4	8.70
Silicon	11.4	Ferrous carbonate,	$FeCO_3$	1.6	.09
Nitrate, NO_3	.6	Alumina,	$Al_2 O_3$	3.2	.18
Chloride, Cl	245.0	Silica,	SiO_2	24.4	1.42
Sulphate, SO_4	649.6	Magnesium sulphate,	$MgSO_4$	192.0	11.19
		Total		1,513.6	88.86

Carbondale, Jackson county (3318), obtains its water supply from wells 411 and 417 feet deep, respectively. Plant is owned by the Carbondale Light and Water Company and is now in the hands of a receiver. The supply is is said to be deficient. For sanitary analysis see final table.

Analyses of the mineral content gave the following results:

LABORATORY NOS. 9068, APRIL 17, 1901, 14721. AUG. 31, 1906 AND 14722, AUG. 31, 1906.

	Parts Per Million.		
Ions.	9068	14721	17422
Potassium, K	4.8		
Sodium, Na	658.8	861.3	464.9
Ammonium, (NH_4)	.8	.8	.2
Magnesium, Mg	9.0	26.4	4.9
Calcium, Ca	24.4	60.9	9.9
Ferrous, Fe	.9	.6	.4
Aluminium, Al	.8	10.4	2.6
Silicon, Si	3.9		5.6
Nitrate, NO_3	.5	1.2	1.2
Chloride, Cl	825.	1,178.6	480.1
Sulphate, SO_4	33.8	57.3	22.5

Hypothetical Combinations.		Parts Per Million.			Grains Per Gallon.		
		9068	14721	14722	9068	14721	14722
Potassium nitrate,	KNO_3	.8	.....	.....	.04	.....	.....
Potassium chloride,	KCl	8.5	.....	.....	.49	.....	.....
Sodium nitrate,	$NaNO_3$	.....	16.6	1.6	.....	.09	.09
Sodium chloride,	NaCl	1,354.0	1,944.9	792.3	78.47	113.45	46.22
Sodium sulphate,	Na_2SO_4	50.0	84.8	33.3	2.90	4.95	1.94
Sodium carbonate,	Na_2CO_3	254.1	154.4	325.7	14.74	9.01	19.00
Ammonium carbonate,	$(NH_4)_2CO_3$	2.1	2.1	.5	.12	.12	.03
Magnesium carbonate,	$MgCO_3$	34.8	91.4	17.0	2.02	5.33	.99
Calcium carbonate,	$CaCO_3$	61.1	152.0	24.7	3.54	8.87	1.44
Ferrous carbonate,	$FeCO_3$	1.9	2.1	.8	.11	.12	.05
Alumina,	Al_2O_3	1.6	10.4	2.6	.09	.61	.15
Silica,	SiO_2	8.4	29.6	5.6	.49	1.73	.33
Bases,		.....	2.0	1.0	.....	.12	.06
		1,776.3	2,474.4	1,205.1	103.01	144.40	70.30

Carbon Hill, Grundy county (1252), obtains its supply from an artesian well 1900 feet deep, from which the water flows direct through the mains.

Carlinville, Macoupin county (3500, estimated 3800); is located on Macoupin creek. The water supply is obtained from Macoupin creek. The system is owned by a private company. The water is filtered through mechanical filters and is pumped directly into the mains. For sanitary analysis see final table.

Note—Water supply was to have been improved during the summer of 1906.

Carlyle, Clinton county (1874), is located on the Kaskaskia river and obtains its water supply from the river. The water system is owned by the city and was established in 1887 at a cost of $30,000. Dean duplex pumps are used. Daily consumption is 100,000 gallons. The water is not filtered.

ANALYSES OF WATER FROM KASKASKIA RIVER AT CARLYLE, ILLINOIS.

AUGUST 1st TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica, SiO_2	Iron Fe.	Aluminium, Al.	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium, Na.	Bi-Carbonate HCO_3	Sulphate, SO_4	Chlorine, Cl.	Nitrate, NO_3
1201.....	Aug...	1–10	120	70	273	16	.2	....	38	24	15	292	19	9.	2.
1202.....	..do....	11–20	224	126	235	11	.1	....	44	24	16	218	24	7.5	1.9
1203.....	..do....	22–30	300	227	204	20	.06	....	36	17	16	.....	.....	.....	. .
1205.....	Sept...	10–19	127	71	284	61	.15	....	42	22	22	221	25	6.	.5
1206.....	..do....	20–29	106	55	274	16	.07	....	46	20	14	251	26	9.5	1.2
1207.....	..do....	30–7	210	156	164	23	.2	....	26	23	21	95	25	8.2	.9
1208.....	Oct....	10–19	70	46	233	13	.08	....	44	18	17	204	32	12	.9
1209.....	..do....	21–28	40	29	273	14	.8	.8	55	25	24	284	29	7.5	.5
1210.....	..do....	30–8	20	12	268	17	.03	....	53	26	15	270	29	8.5	.6
1211.....	Nov...	10–19	20	13	269	8.8	.03	....	56	25	20	294	28	11	.5
1212.....	..do....	20–30	273	113	198	24	.18	....	21	16	13	154	24	5.	3.
1213.....	Dec....	1–10	293	178	225	18	.28	....	37	16	17	205	38	11	5.5
1214.....	..do....	11–20	184	133	251	17	.64	....	43	23	16	192	28	6.	5.
1215.....	..do....	21–31	30	36	291	14	. 2	....	56	28	16	272	45	7.5	4.
Average			144	90	245	20	.21	....	43	22	17	410	28	8.3	2.0

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	2.7	.16
Sodium chloride,	NaCl	13.7	.80
Sodium sulphate,	Na_2SO_4	33.6	1.96
Magnesium sulphate,	$MgSO_4$	6.6	.38
Magnesium carbonate,	$MgCO_3$	71.7	4.18
Calcium carbonate,	$CaCO_3$	107.3	6.26
Iron carbonate,	$FeCO_3$	.4	.02
Silica,	SiO_2	20.0	1.17
Total		256.0	14.93

Carmi, White county, (2939) is located on the Little Wabash river. The water supply is obtained from the river. The system is owned by the city and was established in 1894 at a cost of $40,000.00. There are two Dean pumps with a daily capacity of 750,000 gallons. The daily consumption is 400,000 gallons.

For sanitary analysis see final table.

ANALYSES OF WATER FROM LITTLE WABASH RIVER AT CARMI, ILLINOIS, AUGUST 1st TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica, SiO_2	Iron Fe.	Aluminium, Al	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium. Na.	Bi-Carbonate HCO_3	Sulphate, SO_4	Chlorine, Cl.	Nitrate, NO_3
1101.....	Aug...	1–10	20	9	219	38	.2	....	27	15	18	184	19	.....	.8
1102.....	..do....	11–20	40	25	211	22	.2	....	31	16	22	160	26	12	1.9
1103.....	..do....	21–30	144	55	174	28	.25	....	23	8.3	14	97	25	14	1.5
1104.....	..do....	31–9	142	60	163	38	.32	....	21	13	14	91	22	6.3	1.5
1105.....	Sept...	10–19	70	27	145	23	.4	....	21	15	12	85	22	5.	1.0
1106.....	..do....	20–29	90	38	147	18	.3	....	23	13	15	95	24	5.5	2.0
1107.....	..do....	30–9	127	64	138	19	.35	....	16	10	14	76	21	9.	1.5
1108.....	Oct....	10–18	178	84	185	25	1.1	....	19	15	18	75	33	10	3.
1109.....	..do....	20–29	70	23	188	30	2.0	3.4	22	9.3	21	93	32	6.5	.6
1110.....	..do....	30–7	30	19	187	26	.6	....	24	14	16	118	44	11	.9
1111.....	Nov...	9–19	110	31	165	15	1.	2.	27	19	18	98	35	11	2.
1112.....	..do....	20–30	430	170	111	18	.7	....	13	4.0	6.4	39	19	1.	3.
1113.....	Dec....	1–9	182	68	153	27	1.5	....	17	9.1	16	69	33	8.8	3.5
1114.....	..do....	12–20	273	109	185	39	3.7	9.6	15	3.8	15	52	23	6.5	2.5
1115.....	..do....	21–31	151	77	184	39	3.7	8.0	16	5.3	16	64	38	5.5	2.5
Average	.....	.....	197	57	170	27	1.1	5.8	21	11.3	15.7	93	26	8.	1.9

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	2.6	.15
Sodium chloride,	NaCl	13.2	.77
Sodium sulphate,	Na_2SO_4	30.2	1.76
Magnesium sulphate,	$MgSO_4$	7.0	.41
Magnesium carbonate,	$MgCO_3$	34.3	2.00
Calcium carbonate,	$CaCO_3$	52.4	3.05
Iron carbonate,	$FeCO_3$	2.3	.13
Silica,	SiO_2	27.0	1.57
Total		169.0	9.84

Carpentersville, Kane county, (1,002), located on Fox river, has no general water supply, but is considering the establishment of a system.

Carrollton, Greene county, (2,355), is located five miles from Muddy creek. The water supply is obtained from a spring four miles from the city. The plant, owned by the city, was established in 1890, and remodeled in 1901. The water supply has been changed from artesian to spring water because the artesian water was too salty. There is a Dean pump with a capacity of 75,000 gallons, with a Smith Vail pump having a capacity of 350,000 gallons. The daily consumption is 250,000 gallons.

For sanitary analysis see final table.

Analyses of the mineral contents gave the following results.

No. 3513 is from the artesian well.

Ions.	Parts Per Million.		
Laboratory No.	3,513	10,535	10,767
Potassium, K	46.1	2.	8.4
Sodium, Na	904.2	9.2	10.5
Ammonium, NH_4	1.7		.1
Magnesium, Mg	58.1	28.1	27.7
Calcium, Ca	139.8	83.1	73.4
Ferrous, Fe	1.5	.8	.4
Aluminium, Al	.6	.5	.7
Silica, SiO_2	4.2	3.3	5.9
Nitrate, NO_3	1.7	15.	13.
Chloride, Cl	1335.0	3.8	4.8
Sulphate, SO_4	487.2	11.70	16.5

Hypothetical Combinations.		Parts Per Million.			Grains Per U. S. Gallon.		
		3,513	10,535	10,767	3,513	10,535	10,767
Potassium nitrate,	KNO_3	2.9	5.2	21.2	.17	.30	1.24
Potassium chloride,	KCl	86.		.3	5.02		.02
Sodium nitrate,	$NaNO_3$		16.1			.94	
Sodium chloride,	NaCl	2,132.5	6.3	7.6	124.40	.37	.44
Sodium sulphate,	Na_2SO_4	201.3	7.3	23.1	11.74	.43	1.35
Ammonium sulphate,	$(NH_4)_2SO_4$	6.6		.4	.38		.02
Magnesium sulphate,	$MgSO_4$	288.6	8.7	.9	16.83	.51	.05
Magnesium carbonate,	$MgCO_3$		92.	92.2		5.37	5.38
Calcium sulphate,	$CaSO_4$	162.			9.45		
Calcium carbonate,	$CaCO_3$	228.4	207.7	183.4	13.32	12.12	10.70
Ferrous carbonate,	$FeCO_3$	3.	1.6	.8	.17	.09	.05
Alumina,	Al_2O_3	1.2	1.	1.4	.07	.06	.08
Silica	SiO_2	9.	7.2	12.5	.52	.42	.73
	Total	3,121.5	353.1	343.8	182.07	20.61	20.06

Carterville, Williamson county (1749), has no municipal water supply.

Carthage, Hancock county, (2,104), obtains it water supply from two deep wells, one going 1,000 feet to the St. Peter sandstone, the other going 1,700 feet. Water veins are struck at 750 feet in the Niagara limestone, at 865 feet in the Galena limestone and at 975 feet in the Potsdam sandstone (Leverett).

Casey, Clark county, (1,500, estimated 3,000), has water works in course of construction. The works are to be owned by the city. The supply will be from wells 20-40 feet deep in limestone.

Centralia, Marion county, (6,721, estimated 13,000), is located on Crooked creek. The water supply is obtained from the creek and the system is owned by the city. A reservoir is situated three miles north of the city. The pump is a Dean compound duplex. The daily consumption is 800,000 gallons. The water is not used for drinking purposes.

For sanitary analysis see final table.

Cerro Gordo, Piatt county, (1,008), is located about four miles from the Sangamon river. It has no general water supply.

Chadwick, Carroll county, (505), obtains its water supply from a well 600 feet deep. Water is pumped to wooden tank on a brick tower. System is owned by the city.

For sanitary analysis see final table.

An analysis of the mineral contents gave the following results:

LABORATORY No. 14556.

Ions,		Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per Gallon.
Sodium,	Na	17.1	Sodium nitrate,	$NaNO_3$	1.2	.07
Ammonium,	NH_4	1.1	Sodium chloride,	NaCl	1.7	.10
Magnesium,	Mg	42.9	Sodium sulphate,	Na_2SO_4	2.2	.13
Calcium,	Ca	86.1	Sodium carbonate,	Na_2CO_3	35.4	2.06
Iron,	Fe	.6	Ammonium carbonate,	$(NH_4)_2C_3$	2.9	.17
Alumina,	Al_2O_3	2.4	Magnesium carbonate,	$MgCO_3$	148.6	8.67
Nitrate,	NO_3	.9	Calcium carbonate,	$CaCO_3$	212.4	12.39
Chloride,	Cl	1.0	Iron carbonate,	$FeCO_3$	1.2	.07
Sulphate,	SO_4	1.5	Alumina,	Al_2O_3	2.4	.14
Silica,	SiO_2	20.4	Silica,	SiO_2	20.4	1.19
Bases		.8	Bases,		.8	.05
			Total		429.2	25.04

Champaign, Champaign county, (9,098, estimated 15,000), obtains its water supply from deep wells in the drift. The water works are owned by a private corporation and are situated in the northwestern part of the city of Urbana. The pumps have a capacity of 5,500,000 gallons. The daily consumption is 900,000.

For sanitary analysis see following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF CHAMPAIGN.

Serial number.	Date of collection.	Appearance			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
								Ammonia.			
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
10904.....	Mar. 3, 1903	Distinct.....	.3	000	396.4	2.3	4.9	3.280	.152	.000	.16
10997.....	April 17, 1903	. . do.....	.2	000	366.4	1.8	4.8	3.200	.124	.000	.16
11078.....	May 19, 1903	Very slight....	.3	000	388.4	2.2	5.3	3.600	.144	.000	.20
11162.....	June 26, 1903	. . do.....	.4	000	371.2	.....	5.8	3.68	.214	.000	.16
11291.....	Aug. 19, 1903	Distinct.....	.7	Gas	404.0	2.2	5.5	3.60	.118	.000	.18
.....	.....	.....	.....	.....	385.3	.....	5.2	3.47	.150	.000	.15
.....	.....	.....	.....	.....	.....	2.1	.....	.....	.....	.....	.....
12557.....	Nov. 15, 1904	Distinct.....	.7	0000	390.0	2.4	6.1	3.52	.224	.001	.12
13188.....	May 27, 1905	Decided.....	.4	000	401.0	1.75	4.95	3.36	.170	.000	.20
13533, 13551, 13583, 13585, 13597, 13709	.....	Clear.....	.0	000	363.0	2.0	4.95	3.36	.140	.000	.12

For mineral analysis see Urbana.

Charleston, Coles county, (5,488, estimated 7,500), is located on the Embarass river. The water supply is obtained from the river. The system

is owned by the city and was established in 1890, at a cost of $35,000. The pumps are of the Dean type. The daily consumption is 750,000 gallons.

ANALYSES OF WATER FROM EMBARASS RIVER AT CHARLESTON, ILLINOIS, AUGUST 1 TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica SiO_2	Iron Fe	Aluminium, Al.	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium, Na.	Bi-Carbonate, HCO_3	Sulphate, SO_4	Chlorine, Cl	Nitrate NO_3
1501	Aug	1–10	215	184	297	27	.3	....	48	25	20	270	31	7.5	2.8
1502	.. do	11–20	268	172	230	21	.2	....	39	18	12	182	22	4.2	2.1
1503	.. do	22–30	400	167	226	23	.06	....	36	18	16	182	24	2.	3.5
1504	.. do	31–9	100	41	282	18	.08	....	57	29	15	282	28	5.5	1.7
1505	Sept	10–19	214	78	214	21	.3	....	38	20	7.3	190	22	3.5	1.4
1506	.. do	20–27	220	94	212	17	.45	....	38	18	11	192	23	5.5	2.5
1507	.. do	30–9	182	108	316	19	.04	....	56	28	28	287	27	5.	3.0
1508	Oct	10–19	70	42	310	11	.16	....	58	31	16	315	36	5.	1.5
1509	.. do	20–28	30	20	291	10	.14	....	61	33	21	322	32	7.2	.5
1510															
1511	Nov	11–19	100	64	293	6.4	.1	....	59	39	16	320	30	7.2	.4
1512	.. do	20–30	200	178	258	18	.06	....	37	22	11	246	18	5.3	5.0
1513	Dec	1–10	163	175	283	26	.2	....	54	25	18	280	32	4.	8.
1514	.. do	11–20	144	144	277	13	.09	....	54	26	11	257	26	5.5	8.
1515	.. do	21–31	224	361	300	12	.32	....	57	31	10	286	34	6.	8.
Average	.....	.....	181	131	271	17	.18	....	50	26	15.2	258	24	5.2	4.8

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	6.6	.38
Sodium chloride,	NaCl	8.6	.50
Sodium sulphate,	Na_2SO_4	30.8	1.79
Magnesium sulphate,	$MgSO_4$	9.0	.52
Magnesium carbonate,	$MgCO_3$	83.8	4.89
Calcium carbonate,	$CaCO_3$	124.8	7.28
Iron carbonate.	$FeCO_3$	.4	.02
Silica,	SiO_2	17.0	.99
Total.		281.0	16.37

Chatsworth, Livingston county, (1,038). The water supply is obtained from two wells 80 feet deep, from which the water is pumped into an elevated tank. Plans are being made for the sinking of a deep well.

Chenoa, McLean county, (1,512), obtains its water supply from two wells 135 and 214 feet in depth.*

Chester, Randolph county (2832), is situated on the Mississippi river. The water supply is obtained from the river. For drinking purposes cisterns are used.

Chicago, Cook county (1,698,575, estimated 2,231,000), is located on Lake Michigan, from which they obtain their water supply. Reports are published by the city of Chicago, to which we would refer those interested. For sanitary analysis see final table.

Chicago Heights, Cook county (5,100, estimated 12,000), is located on Thorn creek. The water system is owned by the city and was established in 1892 at a cost of $60,000. The water supply is obtained from eight artesian wells. The pumps have a capacity of 11,000,000 gallons. Daily consumption is 2,500,000 gallons, because of about thirty manufacturing plants.

*Leverett, monograph XXXVIII, p. 693.

Chillicothe, Peoria county (1,699, estimated 2,600), is located on the Illinois river. The water system was established in 1891 and is owned by a private company. The supply is taken from several wells forty-two feet deep along the bank of the river. There are two Smedley pumps, each of 750,000 gallons daily capacity. For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 3569, MAY 11, 1898.

Ions.	Parts Per Million.	Hypothetical combinations.		Parts Per Million.	Grains Per U.S.Gallon.
Potassium, K	5.0	Potassium nitrate,	KNO_3	12.9	.75
Sodium, Na	10.6	Sodium nitrate,	$NaNO_3$	23.2	1.42
Magnesium, Mg	55.3	Sodium chloride,	NaCl	11.1	.64
Calcium, Ca	81.2	Magnesium chloride,	$MgCl_2$	16.9	.98
Ferrous. Fe	.14	Magnesium sulphate,	$MgSO_4$	94.4	5.50
Aluminium, Al	1.8	Magnesium carbonate,	$MgCO_3$	41.1	2.39
Silicon, Si	5.3	Calcium carbonate,	$CaCO_3$	202.9	11.82
Nitrate, NO_3	24.3	Ferrous carbonate,	$FeCO_3$	.3	.16
Chloride, Cl	13.	Alumina,	Al_2O_3	3.4	.20
Sulphate, SO_4	75.4	silica,	SiO_2	13.3	.77
		Total		419.5	24.63

Chrisman, Edgar county (995), obtains its water supply from two wells 140 and seventeen feet deep, respectively. For sanitary analysis see final table.

Analyses of the mineral content gave the following results:

LABORATORY NO. 10701, NOV. 11, 1902 (140 feet deep). LABORATORY NO. 10702, NOV. 11, 1902 (17 feet deep).

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
	10,701	10,702			10, 701	10, 702	10, 701	10,702
Sodium, Na	588.8	11.3	Sodium nitrate,	$NaNO_3$	.9	2.7	.05	.16
Ammonium (NH_4)	2.1	.....	Sodium chloride,	NaCl	937.2	42.1	54.67	2.46
Magnesium, Mg	8.7	45 3	Sodium sulphate,	Na_2SO_4	6.0.....		.35	.....
Calcium, Ca	15.4	116.1	Sodium carbonate,	Na_2CO_3	343.5.....		20.03	.....
Silica, Si	3.9	3 2	Ammonium carbonate	$(NH_4)CO_3$	5.6.....		.33	.....
Nitrate, NO_3	.7	1 9	Magnesium chloride,	$MgCl_2$	.....	22.1	.....	1.29
Chloride, Cl	567.5	42.0	Magnesium sulphate,	$MgSO_4$	.....	194.1	.....	11.32
Sulphate, SO_4	4.1	156 3	Magnesium carbonate	$MgCO_3$	30.2.....		1.76	.....
			Calcium sulphate,	$CaSO_4$	.....	1.5	.....	.09
			Calcium carbonate,	$CaCO_3$	38.6	290.2	2.26	16.93
			Oxide of iron and alum inium,	$Fe_2O_3+Al_2O_3$	6.8	3.4	.40	.20
			Silica,	SiO_2	8.4	6.9	.49	.40
			Suspended matter		839.2	7.9	48.96	.46
			Total		2216.4	570.9	129.30	33.31

Clinton, DeWitt county, (4,452, estimated 6,500), is located three miles from Salt creek. The water supply is obtained from tubular wells, twenty-six to eighty feet deep, and from springs. The system is owned by the city and the original installation cost $40,000. For sanitary analysis see following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF CLINTON.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.	Alkalinity.
		Turbidity.	Color.	Odor.				Free.	Albuminoid.			
4657...	Jan. 31, 1899	Distinct.	.4	00	386.0	1.8	5.5	.640	.052	.000	.10	.....
11401...	Sept. 23, 1903	Decided.	Muddy	00	442.8	2.4	9.2	3.84	.358	.000	.08	.....
11443...	Oct. 6, 1903	..do.....	Yellow	00	449.6	2.0	8.1	4.00	.246	.000	.08	.....
13591...	Sept. 25, 1905	..do.....	..do....	00	473.0	3.5	2.5	.688	.088	.000	.16	.....
13592...	..do.....	..do.....	..do....	00	488.0	2.9	2.6	.720	.054	.000	.36	.....
13593...	..do.....	..do.....	..do....	00	478.0	2.1	2.6	.752	.058	.000	.24	.....
13594...	..do.....	Slight...	.5	000	216.0	2.9	3.9	.170	.216	.032	.76	.....
13596...	..do.....	Distinct.	.5	000	468.0	2.6	4.40	1.36	.214	.040	.52	.....
14636...	July 17, 1906	..do.....	.4	0	547.0	5.5	2.25	.768	.072	.004	.200	415.1
14637...	..do.....	Decided.	Muddy	0	708.0	2.5	36.1	.200	1.40	.013	.987	102.8
14638...	..do.....	Distinct.	.5	0	424.0	2.5	10.7	2.0	.40	.013	.587	287.0
14639...	..do.....	..do.....	.5	Musty	516.0	5.0	2.25	.800	.064	.006	.400	419.0
14640...	..do.....	..do.....	Muddy	0	752.0	2.5	33.6	.200	1.48	.013	1.50	102.8
14648...	..do.....	Decided.	.4	0	414.0	2.5	11.5	1.92	.400	.015	.545	289.0
14715...	Aug. 6, 1906	Distinct.	.2	0	578.0	6.5	5.35	.280	.160	.005	.200	353.0
14716...	..do.....	Decided.	Muddy	0	371	2.0	9.5	.208	.352	.008	.160	203.6

Analysis of the mineral content of springs and wells gave the following results:

SPRINGS LABORATORY NO. 9327, AUG. 27, 1901. WELLS LABORATORY NO. 4674, FEB. 2, 1899.

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Grains Per U.S.Gallon	
	9327	4674			9,327	4,674	9,327	4,674
Potassium, K.	2.5	2.1	Potassium nitrate,	KNO_3	.7	1.1	.04	.06
Sodium, Na	8.9	8.9	Potassium chloride	KCl	3.5	2.5	.20	.15
Ammonium, (NH_4)	.1	.8	Potassium sulphate,	K_2SO_4	.....	1.7	.....	.10
Magnesium, Mg	33.8	41.3	Sodium chloride,	NaCl	1.1	.....	.06	.....
Calcium, Ca	51.6	94.7	Sodium sulphate,	Na_2SO_4	16.7	2.5	.97	.15
Ferrous, Fe	2.6	.3	Sodium carbonate,	Na_2CO_3	7.2	18.6	.42	1.18
Aluminium, Al	.7	.4	Magnesium carbonate,	$MgCO_3$	143.6	117.6	8.38	6.84
Silicon, Si	10.2	8.4	Calcium carbonate,	$CaCO_3$	236.4	136.8	13.79	7.98
Nitrate, NO_3	.7	.5	Ferrous carbonate,	$FeCO_3$	.6	5.5	.03	.32
Chloride, Cl	1.2	2.3	Alumina,	Al_2O_3	.7	1.4	.04	.08
Suphate, SO_4	2.7	11.3	Silica,	SiO_2	17.9	21.8	1.04	1.27
Carbonate, CO_3			Ammonium carbonate,	$(NH_4)_2CO_3$	2.1	.3	.12	.02
				Total	430.5	309.8	25.09	18.15

Coal City, Grundy county (2,607). The water works are said to be used for fire protection only.

Cobden, Union county (1,034), has no general water supply.

Colchester, McDonough county (1,635), has no general water supply.

Colfax, McLean county (1,153), has no general water supply.

Collinsville, Madison county (4,021), obtains its water supply from four ten-inch wells ninety feet deep. They are located in the American bottoms, about eight miles east of the Mississippi river. Originally the supply was

obtained from wells 300 to 600 feet deep, but water from these contained too much mineral matter. The water works are owned by the city and were established in 1902 at a cost of $33,000. There are two Dean compound duplex pumps and the daily capacity is given as 720,000 gallons each. The daily consumption is 100,000 gallons. For sanitary analysis see final table.

Columbia, Monroe county (1,197, estimated 1,400), has no general water supply.

Creal Springs, Williamson county (940, estimated 1,050), has no general water supply, but has under consideration the establishment of a system. Springs give an abundant supply of water and are well distributed throughout the city. For sanitary analysis see final table.

Crotty, LaSalle county (mail, Seneca) (1,036), has sent no report.

Cuba, Fulton county (1,198), has no general water supply.

Danville, Vermilion bounty (16,354), is located on the Vermilion river. The water supply is obtained from the North Fork of the Vermilion river, The system was established in 1883 and is owned by a private company. Daily consumption is 3,000,000 gallons. The water is treated with lime and iron sulphate and filtered by the Jewel system.

For sanitary analysis see the following table:

ANALYSIS OF WATER FROM NORTH FORK OF THE VERMILION RIVER AT DANVILLE, ILL., CITY SUPPLY—UNFILTERED

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0. 1 c. c.
10713	Oct. 24, 1902	Distinct	Muddy	.00	368.4	2.8	5.6	.024	.188	.042	.918	.....	.....	.....	.....	.....
14064	Mar. 6, 1906	Decided	Muddy	Earthy	337.	1.5	8.80	.072	.280	.005	2.40	196.4	.....	.....	.....	.....
14146	Mar. 26, 1906	V. Decided.	.4	.00			30.4	.032	.200	.004	1.52	169.0	2,180	1–	2–	2–
14240	April 23, 1906	Decided	.00	4 Earthy	319.	2.0	3.75	.048	.184	.020	2.62	190.4	1,500	1–	2–	2–
14401	May 21, 1906	Decided	.2	4 Musty	320.	3.5	4.4	.064	.174	.013	.87	204.	1,900	1+	1+	2–
															1–	
14546	June 26, 1906	Decided	.3	.00	358.	5.0	5.25	.112	.200	.004	.594	234.	300	1+	2+	2–
14682	July 24, 1906	Decided	.3	Musty	407.	3.0	9.5	.144	.280	.012	.64	186.2	1,260	.....	3+	2+
14726	Aug. 6, 1906	do.	Muddy	.00	382.	3.5	7.4		.304	.005	.24	236.7	Liq.	1+	2–	2+
14855	Aug. 27, 1906	V. Decided.	.....	.....	306.	2.0	10.2	.064	.124	.020	.780	164.9	4,400	1+	2+	1+
																1–
15041	Sept. 25, 1906	Decided	Muddy	Fishy	506.	5.0	9.5	.032	.384	.001	.199	224.6	13,500	1+	1?	1+
															1–	1–
15227	Oct. 24, 1906	do.	.4	2 Musty	319.	5.0	6.6	.056	.240	.000	.200	253.4	850	1?	2+	2–
15413	Dec. 3, 1906	Slight	.2	.00	320.	2.0	3.3	.080	.088	.015	1.88	226.6	4,000	1–	2–	2–

ANALYSIS OF WATER FROM NORTH FORK OF VERMILION RIVER AT DANVILLE, ILL., CITY SUPPLY—FILTERED. 1906.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	c. c.	0.1 c. c.
14065	Mar. 6, 1906	Slight.	.00	.00	331.	1.5	3.35	.072	.112	.008	2.00	181.4	.....	.....	.....	.....
14147	Mar. 26, 1906	Clear.	.00	.00	277.	2.0	3.35	.024	.080	.005	1.52	180.4	370	1—	2—	2—
14241	April 23, 1906	.do.	.00	.00	251.	1.75	3.00	.024	.112	.000	2.80	155.8	70	1 +	1+ 1—	2—
14402	May 21, 1906	.do.	.00	2Ear	320.	3.5	3.6	.076	.138	.002	.80	199.	300	1—	2—	2—
14547	June 25, 1906	.do.	.00	.00	307.	5.0	3.20	.560	.136	.000	.80	215.	100	1 +	2—	2—
14683	July 24, 1906	.do.	.20	Sour	243.	3.0	4.00	.024	.096	.000	.480	126.1	70	1 +	2+	1— 1 +
14734	Aug. 6, 1906	.do.	.00	.00	322.	4.0	4.65	.024	.144	.010	.320	215.3	10	1 + 1—	2+	1 +
14856	Aug. 27, 1906	.do.	.00	.00	233.0	2.0	3.6	.016	.106	.000	.720	143.6	154	1 +	1+ 1—	2—
15042	Sept. 25, 1906	.do.	.00	.00	237.	4.0	4.7	.024	.400	.000	.160	192.	166	1 +	2+	1? 1 +
15228	Oct. 24, 1906	.do.	.00	3Ear	250.	5.0	4.05	.008	.104	.000	.320	141.9	350	1—	2—	2—
15412	Dec. 3, 1906	Slight.	.2	.00	319.	4.0	2.3	.032	0.72	.003	1.800	207.4	.....	.....	.....	.....

Analyses of the mineral content of the river water and treated water follow:

Amounts stated in Parts per Million.

Ions.	Raw May 29, 1906.	Filtered May 29, 1906.			Raw July 3, 1906.	Treated July 3, 1906.	Filtered Aug. 6, 1906.
	10713	14146	147147	14240	14241	14401	14402	14733
Potassium, K		1.8	.9	1.2	.9			
Sodium, Na	24.3	6.2	7.4	8.6	8.1	8.9	14.0	16.7
Ammonium, (NH_4)				.10		.1	.1	.1
Magnesium, Mg	23.8	26.6	28.	27.6	26.2	29.0	29.2	24.7
Calcium, Ca	46.9	56.0	65.7	62.6	50.5	57.9	56.6	53.5
Ferrous, Fe		4.6	.14	.7	.3	.5	.3	.3
Aluminium, Al		10.3	2.0	2.1	.7	1.9	1.6	1.4
Silicon, Si	.7	74.3	6.0	14.2	7.2		2.3	10.0
Nitrate, NO_3	.4	6 7	6.7	11.5	12.4	3.8	3.5	1.2
Chloride, Cl	2.8	2.5	2.0	2.0	1.75	3.5	3.5	4.5
Sulphate, SO_4	31.5	46.0	55.7	36.9	40.8	36.5	41.3	37.0

Hypothetical Combinations. Amounts stated in Parts per Million.

		10713	14146	14147	14240	14241	14401	14402	14733
Potassium nitrate,	KNO_3		4.7	2.3	3.1	2.3			
Sodium nitrate,	$NaNO_3$	5.5	5.2	7.2	13.2	15.1	5.2	4.8	1.6
Sodium chloride,	NaCl	4.6	4.1	12.6	3.3	3.0	5.8	5.8	7.4
Sodium sulphate,	Na_2SO_4	46.7	9.9		11.4	8.6	16.0	32.1	41.3
Sodium carbonate,	Na_2CO_3	13.5							
Ammonium sulphate,	$(NH_4)_2SO_4$						.4	.4	.4
Magnesium sulphate,	$MgSO_4$		49.3		36.6	43.9	30.6	24.2	11.0
Magnesium carbonate,	$MgCO_3$	82.7	57.5	59.2	70.0	59.9	79.0	84.2	77.9
Calcium carbonate,	$CaCO_3$	117.1	139.8	164.0	156.3	126.0	144.5	141.3	133.5
Oxide of iron and alumina,	Fe_2O_3+ Al_2O_3	4.3		2.0					
Ferrous carbonate,	$FeCO_3$		9.5	.3	1.5	.6	1.0	.6	.6
Alumina,	Al_2O_3		10.3		2.1	.7	1.9	1.6	1.4
Silica,	SiO_2	14.8	74.3	6.0	14.2	7.2	6.7	2.3	10.0
Bases,		34.1	30.8		4.3	4.0	3.6	2.0	.6
Total		323.3	395.4	312.4	316.0	271.3	294.7	299.3	285.7

Hypothetical Combinations. Amounts stated in Grains per U. S. gallon.

		10713	14146	14147	14240	14241	14401	14402	14733
Potassium nitrate,	KNO_3		.27	.13	.18	.13			
Sodium nitrate,	$NaNO_3$	.32	.30	.43	.77	.88	.30	.28	.09
Sodium chloride,	NaCl	.27	.24	.73	.19	.17	.34	.34	.43
Sodium sulphate,	Na_2SO_4	2.72	.58		.66	.50	.93	1.89	2.41
Sodium carbonate,	Na_2CO_3	.79							
Ammonium sulphate,	$(NH_4)_2SO_4$						.02	.02	.02
Magnesium sulphate,	$MgSO_4$	4.32	2.97		2.13	2.56	1.78	1.41	.64
Magnesium carbonate,	$MgCO_3$	4.82	3.35	3.45	3.08	3.49	4.61	4.91	4.54
Calcium carbonate,	$CaCO_3$	6.83	8.15	9.57	9.12	7.35	8.43	8.24	7.79
Oxide of iron and alumina,	Fe_2O_3+ Al_2O_3	.25		.11					
Ferrous carbonate,	$FeCO_3$		.55	.02	.09	.03	.06	.03	.03
Alumina,	Al_2O_3		.60		.12	.04	.11	.09	.08
Silica,	SiO_2	.87	4.33	.35	.83	.42	.39	.13	.58
Bases,		1.99	1.89		.25	.23	.21	.12	.03
Total		18.86	23.04	18.21	18.41	15.80	17.18	17.44	16.64

ANALYSES OF WATER FROM VERMILION RIVER AT DANVILLE, ILLINOIS, AUGUST 1st TO DECEMBER 31st, 1906.

Designation.	Month.	Composite Sample	Turbidity.	Suspended Matter.	Total Solids.	Silica SiO_2	Iron Fe	Aluminium. Al.	Calcium, Ca	Magnesium, Mg	Sodium and Potassium, Na	Bi-Carbonate, HCO	Sulphate, SO_4	Chlorine, Cl	Nitrate, NO_3
1701.	Aug.	2–10	135	54	299	20	.4	....	48	31	27	291	39	5.7	.7
1702.	..do.	11–20	300	147	216	18	.5	....	38	32	11	193	27	3.2	2.7
1703.	..do.	22–30	425	201	222	19	.2	....	36	15	15	163	25	4.5	4.5
1704.	..do.	31–9	117	59	282	15	.1	....	56	28	15	241	36	5.	3.
1705.	Sep.	10–19	50	38	267	13	.3	....	44	28	8.7	285	38	5.0	.8
1706.	..do.	20–29	142	68	264	20	.12	....	49	24	15	285	32	7.0	1.8
1707.	..do.	30–9	90	44	275	11	.07	....	52	26	18	270	36	5.	1.2
1708.	Oct.	10–19	20	16	305	10	.04	....	55	37	25	317	39	.....	.....
1709.	..do.	20–29	20	18	322	12	.04	....	59	36	23	326	41	7.5	.6
1710.	..do.	30–8	10	5	342	13	.1	.2	63	36	20	350	47	6.5	.3
1711.	Nov.	9–19	20	7.8	318	6.2	.03	....	60	36	21	330	44	7.5	.6
1712.	..do.	20–30	161	155	279	16	.05	....	53	25	10	220	46	3.5	8.
1713.	Dec.	1–10	125	78	302	21	.06	....	56	26	12	254	47	4.2	14.
1714.	..do.	11–20	50	61	301	12	.17	....	57	27	8.	236	42	4.8	16.
1715.	..do.	21–31	40	47	314	10	.24	....	59	28	14	275	46	4.5	12.
Average	.....	.....	206	67	287	14	.16	.2	52	28	16	269	39	4.9	4.7

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U.S. Gallon.
Sodium nitrate,	$NaNO_3$	6.4	.37
Sodium chloride,	NaCl	8.1	.47
Sodium sulphate,	Na_2SO_4	34.2	1.99
Magnesium sulphate,	$MgSO_4$	19.9	1.16
Magnesium carbonate,	$MgCO_3$	83.1	4.85
Calcium carbonate,	$CaCO_3$	129.9	7.57
Iron carbonate,	$FeCO_3$	.3	.02
Silica,	SiO_2	14.0	.82
Total		295.8	17.25

Decatur, Macon county (20,754, estimated 30,000), is located on the Sangamon river. The water supply is obtained from the river. The system is owned by the city and was established about 1871. The pumps are two E. P. Allis, with a capacity of 3,000,000 gallons each, and one Hugh, with a capacity of 4,500,000 gallons. The water is treated by the Warner filter process, using sulphate of aluminium as coagulant.

For sanitary analysis see the following table:

ANALYSIS OF WATER FROM SANGAMON RIVER AT DECATUR, ILLINOIS—CITY SUPPLY—RAW—1906.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as—				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
								Free.	Albuminoid.							
845	May 13, 1896	.....	.....	.....	328.0	4.7	6.0	.106	.040	.090	1.70	.....	.....	.....	.....	.....
3510	April 28, 1898	Decided.....	.05	.00	296.4	5.0	4.3	.01	.144	.035	.35	.....	.....	.....	.....	.....
3516	April 29, 1898	..do.....	.06	.00	288.8	5.0	4.2	.008	.144	.030	.35	.....	.....	.....	.....	.....
11461	Oct. 13, 1903	..do.....	Muddy.	.00	360.0	2.9	7.1	.068	.224	.010	.83	.....	.....	.....	.....	.....
13404	Aug. 1, 1905	..do.....	..do....	Vegetable.	358.8	.....	6.05	.220	.320	.010	.390	.....	.....	.....	.....	.....
14009	Feb. 13, 1906	..do.....	.00	.00	313.	4.0	3.2	.096	.096	.007	1.193	264.6	335	1—	2—	2—
14140	Mar. 26, 1906	Distinct....	.1	.00	288.	5.0	2.85	.142	.160	.008	1.520	176.6	1230	1—	1—1+	2—
14219	April 16, 1906	Decided.....	Muddy.	.00	326.	2.7	5.25	.050	.214	.008	2.40	174.0	2500	1+	2+	2—
14364	May 14, 1906	..do.....	.3	.00	324.	4.5	6.3	.080	.224	.020	.94	215.7	750	1+	1+1—	2—
14527	June 18, 1906	..do.....	.8	.00	447.	5.0	7.55	.080	.240	.030	1.37	236.6	1180	1+	2+	2—
14718	Aug. 6, 1906	..do.....	.00	.00	383.	3.5	8.5	.272	.288	.040	.36	211.4	.....	1+	2+	2+
15254	Oct. 29, 1906	..do.....	.4	.00	355.	7.0	8.65	.072	.264	.002	.24	270.7	510	1—	2+	1+1—
15452	Dec. 10, 1906	Very decid'd	Muddy.	.00	354.	2.0	11.9	.024	.316	.002	2.08	174.7	4000	1—	2—	2+

ANALYSES OF WATER FROM SANGAMON RIVER AT DECATUR, ILLINOIS, CITY SUPPLY—FILTERED—1906.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 cc.
844	May 13, 1896	.....	.....	.....	286.	4.6	3.2	.....	.....	.006	1.7	.....	.....	.....	.....	.....
3511	April 28, 1898	Distinct....	.04	.00	272.4	5.0	3.5	.006	.094	.030	.30	.....	.....	.....	.....	.....
3517	April 29, 1898	..do.....	.04	.00	269.6	5.0	3.1	.004	.112	.025	.35	.....	.....	.....	.....	.....
11462	Oct. 13, 1903	V. Slight....	.1	.00	303.6	2.8	3.5	.068	.112	.000	1.0	.....	.....	.....	.....	.....
13405	Aug. 1, 1905	Slight.....	.1	Musty.....	327.6	.....	3.95	.046	.144	.015	.465	.....	.....	.....	.....	.....
14010	Feb. 13, 1906	V. Slight....	.00	.00	318.	3.5	2.5	.104	.080	.009	.191	254.	240	1–	2–	2–
14149	Mar. 26, 1906	V. Decided..	.4	.00	452.	5.0	7.5	.072	.296	.008	1.32	180.4	5.700	1–	1– 1+	2+
14220	April 16, 1906	Clear.....	.00	.00	286.	2.3	3.7	.036	.132	.010	2.39	168.	840	1+	2–	2–
14365	May 14, 1906	..do.....	.00	.00	308.	4.0	3.4	.032	.112	.015	.91	206.4	340	2–	2–	2–
14528	June 18, 1906	..do.....	.00	.00	336.	5.5	4.1	.016	.144	.002	1.50	232.8	110	1–	1+ 1–	2–
14719	Aug. 6, 1906	Distinct....	.2	.00	357.	3.5	6.2	.096	.200	.003	.440	209.4	.....	1+	2+	2+*
15097	Oct. 2, 1906	..do.....	.2	.00	305.	3.5	5.05	.016	.160	.002	.720	163.2	160	1–	1+ 1–	2–
15253	Oct. 29, 1906	Slight.....	.2	.00	343.	8.0	5.5	.048	.184	.002	.280	280.3	260	1+	2–	2–
15453	Dec. 10, 1906	V. Decided..	Muddy.	.00	264.	2.0	5.1	.024	.112	.007	2.08	155.5	500	?	1–	2–

*Sample sent uniced.

Analysis of the mineral content gave the following results:

IONS.

Parts per Million.

Laboratory No.	14009	14140	*14315	*14362	14527	14528
	March 23, 1906.	April 26, 1906.	May 10, 1906.	June 9, 1906.	June 22, 1906.	June 22, 1906.
Potassium, K		.9	2.3	1.9		
Sodium, Na	15.0	9.4	39.5	15.9	12.4	9.4
Ammonium, (NH_4)	.3	.18	1.8	2.0	.1	
Magnesium, Mg	29.9	24.7	55.6	35.1	24.5	28.4
Calcium, Ca	74.0	59.5	124.9	112.3	60.0	69.7
Ferrous, Fe	.7	.3	2.5	2.9	5.5	.4
Aluminium, Al	1.3	2.1	3.2	8.1	20.1	.8
Silica, SiO_2	8.9	6.1	24.6	41.9	26.9	6.8
Nitrate, NO_3	5.3	6.7	1.8	1.7	6.1	6.6
Chloride, Cl	4.0	2.0	43.0	17.5	5.0	5.5
Sulphate, SO_4	35.5	42.1	129.7	15.9	26.9	28.7

HYPOTHETICAL COMBINATIONS.

Amounts stated in Parts per Million.

		14009	14140	14315	14362	14527	14528
Potassium nitrate,	KNO_3	.....	2.3	2.9	2.8	.....	.....
Potassium chloride,	KCl	.....	.....	2.3	1.5	.....	.....
Sodium nitrate,	$NaNO_3$	7.3	7.3	69.1	.....	8.4	9.1
Sodium chloride,	NaCl	6.6	3.3	37.9	27.7	8.3	9.1
Sodium sulphate,	Na_2SO_4	32.1	18.8	.....	15.4	21.0	10.2
Sodium carbonate,	Na_2CO_3	.....	.....	6.6	.....	.....	.....
Ammonium sulphate,	$(NH_4)_2SO_4$	1.1	.7	.....	7.6	.4	.....
Ammonium carbonate,	$(NH_4)_2CO_3$	16.3	.....	.....	.....	.....	.....
Magnesium chloride,	$MgCl_2$	92.1	.....	.....	.....	.....	.....
Magnesium sulphate	$MgSO_4$	.....	36.2	124.5	.....	15.5	27.3
Magnesium carbonate,	$MgCO_3$	.....	60.3	105.3	124.7	74.1	79.3
Calcium carbonate,	$CaCO_3$	184.7	148.5	311.8	280.3	149.8	174.0
Ferrous carbonate,	$FeCO_3$	1.5	.6	5.2	6.0	11.4	.8
Alumina,	Al_2O_3	1.3	2.1	3.2	8.1	20.1	.8
Silica,	SiO_2	8.9	6.1	24.6	41.9	67.7	6.8
Bases,		.....	1.1	1.0	11.4	32.0	2.1
Total		351.9	287.3	694.4	527.4	408.7	319.5

HYPOTHETICAL COMBINATIONS.

Amounts stated in Grains per U. S. Gallon.

		14009	14140	14315	14362	14527	14528
Potassium nitrate,	KNO_3	.....	.13	.17	.16	.....	.....
Potassium chloride,	KCl	.....	.....	.13	.09	.....	.....
Sodium nitrate,	$NaNO_3$	.43	.43	4.03	.....	.49	.53
Sodium chloride,	NaCl	.38	.19	2.21	1.62	.48	.53
Sodium sulphate,	Na_2SO_4	1.87	1.10	.....	.90	1.22	.59
Sodium carbonate,	Na_2CO_3	.....	.....	.38	.....	.....	.....
Ammonium sulphate,	$(NH_4)_2SO_4$	.06	.04	.....	.44	.02	.....
Ammonium carbonate,	$(NH_4)_2CO_3$	.95	.....	.....	.....	.....	.....
Magnesium chloride,	MgCl	5.37	.....	.....	.....	.....	.....
Magnesium sulphate,	$MgSO_4$	.....	2.11	7.28	.....	.90	1.59
Magnesium carbonate,	$MgCO_3$	.....	3.52	6.14	7.38	4.32	4.63
Calcium carbonate,	$CaCO_3$	10.77	8.66	18.19	16.35	8.74	10.15
Ferrous carbonate,	$FeCO_3$	.09	.04	.30	.35	.65	.05
Alumina,	Al_2O_3	.08	.12	.19	.47	1.17	.05
Silica,	SiO_2	.52	.36	1.43	2.44	3.95	.40
Bases,		.....	.06	.05	.66	1.87	.12
Total		20.52	16.76	40.48	30.86	23.81	18.64

*Well water from test well.

ANALYSES OF WATER FROM SANGAMON RIVER AT DECATUR, ILLINOIS, AUGUST 1 TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica SiO_2	Iron Fe	Aluminium, Al.	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium, Na.	Bi-Carbonate, HCO_3	Sulphate, SO_4	Chlorine, Cl	Nitrate NO_3
1801.	Aug.	1–10	240	107	262	26	.2	....	46	21	13	241	20	8.2	4.5
1802.	.. do.	11–20	260	121	233	20	.2	....	46	20	8.8	214	23	3.5	4.8
1803.	.. do.	21–30	270	106	264	18	.06	....	53	22	8.5	235	25	2.7	4.0
1804.	.. do.	31–9	117	51	297	17	.09	....	61	27	13	305	26	4.5	4.
1805.	Sept.	10–19	118	49	225	13	.1	....	41	23	14	290	24	5.5	2.0
1806.	.. do.	21–29	70	43	302	15	.03	....	55	24	18	315	22	10.	2.5
1807.	Oct.	1–9	60	40	286	12	.05	....	54	30	15	283	26	5.5	3.0
1808.	.. do.	10–19	20	13	275	10	.15	....	53	30	21	297	27	5.	2.5
1809.	.. do.	20–29	50	33	332	11	.06	....	64	35	20	350	21	8.	1.0
1810	Nov.	1–8	30	19	338	15	.1	....	67	44	19	380	33	7.8	1.0
1811.	.. do.	9–17	20	13	324	11	.02	....	50	28	16	360	25	8.5	.9
1812.	.. do.	20–30	168	104	274	16	.14	....	52	25	12	240	39	3.5	8.
1813.	Dec.	1–10	196	110	283	17	.4	....	51	28	13	278	37	5.5	7.
1814.	.. do.	11–20	30	27	316	29	.16	....	58	30	21	285	37	5.5	6.
1815.	.. do.	21–31	25	31	332	15	.28	....	62	30	12	314	42	7.	8.
Average	.....	.....	112	58	290	16	.14	....	54	28	15	292	28	6.0	3.9

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U.S. Gallon.
Sodium nitrate,	$NaNO_3$	5.3	.31
Sodium chloride,	NaCl	9.9	.58
Sodium sulphate,	Na_2SO_4	29.9	1.74
Magnesium sulphate,	$MgSO_4$	9.8	.57
Magnesium carbonate,	$MgCO_3$	90.0	5.25
Calcium carbonate,	$CaCO_3$	134.8	7.86
Iron carbonate,	$FeCO_3$	.3	.02
Alumina,	Al_2O_3		
Silica,	SiO_2	16.0	.93
Total		296.0	17.26

DeKalb, DeKalb county, (5,904), obtains its water supply from a well 890 feet deep, which reaches the St. Peter sandstone.

Sanitary analysis, see final table.

Analysis of the mineral content gave the following results.

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
	3462	3463–4			3462	3463	3462	3463
Potassium, K	4.1	3.0	Potassium nitrate,	KNO_3	1.8	1.1	.10	.06
Sodium, Na	23.0	29.7	Potassium chloride,	KCl	1.9	1.9	.11	.11
Ammonium, (NH_4)		1.	Potassium sulphate,	K_2SO_4	5.5	3.6	.32	.21
Magnesium, Mg	26.5	23.3	Sodium sulphate.	Na_2SO_4	1.6	1.3	.09	.08
Calcium, Ca	49.4	56.5	Sodium carbonate,	Na_2CO_3	52.8	67.3	3.08	3.93
Ferrous, Fe	.8	.49	Ammonium carbonate,	$(NH_4)_2CO_3$	.....	1.9	.....	.11
Aluminium, Al	.7	.8	Magnesium carbonate,	$MgCO_3$	92.4	81.0	5.39	4.72
Silicon, Si	3.3	6.7	Calcium carbonate,	$CaCO_3$	123.5	141.2	7.20	8.23
Nitrate, NO_3	1.1	.7	Ferrous carbonate,	$FeCO_3$	1.8	1.0	.10	.06
Chloride, Cl	.9	.9	Alumina,	Al_2O_3	.1	2	.01	.01
Sulphate, SO_4	4.1	2.9	Silica,	SiO_2	7.1	14.3	.41	.83
			Total		288.5	314.8	16.81	18.35

Delavan, Tazewell county, (1,304), obtains its water supply from two wells 160 feet deep. The plant is owned by the city. The pumps are of the Cook type and are located in the center of the city. The daily consumption is 50,000 gallons.

Desplaines, Cook county, (1,666, estimated 2,500), is located on the Desplaines river. The water supply is obtained from wells 130 feet deep. The system is owned by the city and was established in 1889 at a cost of $140,000. The pumping station is located on the river. The daily consumption is 30,000 gallons.

Dixon, Lee county, (7,917), is located on the Rock river. The water supply is obtained from wells. The system is owned by Dixon Water Co., and was established in 1880.

For sanitary analysis, see final table.

Dolton Station, Cook county, (1,229), obtains its water supply from a well about 1,700 feet deep. The system is owned by the city and was established in 1899.

Downer's Grove, DuPage county, (2,103), is located on the DuPage river. The water supply is obtained from two wells 200 feet deep. The system is owned by the village. Daily consumption is 120,000 gallons.

Dundee, Kane county, (2,765), is located on Fox river. The water supply is obtained from springs. The system is owned by the city and was established in 1895, at a cost of $42,000. The pumps are Triplex, with a capacity of 480,000 gallons. The daily consumption is 100,000.

DuQuoin, Perry county, (4,353), has no general water supply.

Dwight, Livingston county, (2,015), obtains its water supply from wells 130 feet deep, entirely in the drift.

For sanitary analysis, see final table.

The analysis of the mineral content gave the following results:

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
	12,894	12,895			12,894	12,895	12,894	12,895
Potassium, K	4.7	5.1	Potassium nitrate,	KNO_3	3.2	2.4	.17	.14
Sodium, Na	149.	238.1	Potassium chloride,	KCl	6.7	8.1	.39	.47
Ammonium (NH_4)	2.7	2.7	Sodium chloride,	NaCl	52.5	65.4	3.06	3.29
Magnesium, Mg	50.9	26.3	Sodium sulphate,	$NaSO_4$	397.3	665.2	23.18	28.80
Calcium, Ca	128.7	19.1	Ammonium sulphate	$(NH_4)_2 SO_4$	9.9	9.9	.58	.58
Ferrous, Fe	2.2	.....	Magnesium sulphate,	$MgSO_4$	252.9	131.1	14.75	6.60
Aluminium, Al	1.7	.....	Magnesium carbonate	$MgCO_3$	.....	12.2	.....	.71
Silica, Si	3.9	3.4	Calcium sulphate,	$CaSO_4$	101.1	.....	5.89	.....
Nitrate, NO_3	1.9	1.5	Calcium carbonate,	$CaCO_3$	247.1	47.9	14.41	2.79
Chloride, Cl	35.	38.	Oxide of iron and alum					
Sulphate, SO_4	549.4	547.3	inium,	$FeO_3+Al_2O_3$	.....	2.2	.....	.13
			Ferrous carbonate,	$FeCO_3$	4.5	.....	.26	.....
			Alumina,	Al_2O_3	3.2	.....	.17	.....
			Silica,	SiO_2	8.2	7.2	.48	.42
				Tota	1086.6	990.9	63.34	56.73

Earlville, LaSalle county, (1,122), is located on Indian creek. The water supply is obtained from wells 150 feet deep. The system was established in 1903-4, at a cost of $20,000 and is owned by the city.

East Dubuque, JoDaviess county, (1,146), is located on the Mississippi river. The water supply is obtained from wells 1,000 feet deep, located in business center of city. The system is owned by the city, and was established in 1894, at a cost of $180,000. The pumps used are Worthington compound, and the daily consumption is 75,000 gallons.

East St. Louis St. Clair county, (29,655, estimated 50,000), is located on Mississippi river, from which the city water supply is obtained. The system is owned by private parties and was established in 1895. The daily consumption is 8,000,000. The water is pumped first to a settling basin, is then treated with sulphate of aluminium or with lime and sulphate of iron and passed through a sedimentation basin to filters. The plant is under chemical and bacterial control. The daily consumption is 8,000,000 gallons.

For sanitary analysis, see final table.

An analysis of the mineral content gave the following results:

Ions	Parts Per Million.	Hypothetical combinations.		Parts Per Million.	Grains Per U.S.Gallon.
Sodium, Na	23.2	Sodium nitrate,	$NaNO_3$	1.1	.06
Ammonium, (NH_4)	.448	Sodium chloride,	NaCl	9.6	.56
Magnesium, Mg	13.0	Sodium sulphate,	Na_2SO_4	59.1	3.44
Calcium, Ca	35.9	Ammonium sulphate,	$(NH_4)_2SO_4$	1.6	.09
Silicon, Si	6.2	Magnesium sulphate,	$MgSO_4$	5.5	.32
Nitrate, NO_3	.8	Magnesium carbonate,	$MgCO_3$	41.3	2.41
Chloride, Cl	5.8	Calcium carbonate,	$CaCO_3$	89.8	5.24
Sulphate, SO_4	45.6	Oxide of iron and aluminum,	$Fe_2O_3+Al_2O_3$	11.7	.68
		Silica,	SiO_2	13.2	.77
			Total	232.9	13.57

Edinburg, Christian county, (1,071), has no general water supply.

Edwardsville, Madison county, (4 157), obtains its water supply from driven wells 69 feet deep, about five miles from city and eight miles from Mississippi river. The system is owned by the city and was established in 1898.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF EDWARDSVILLE.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
								ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
1264. .	Aug. 10, 1896	Distinct.	.3	000	662.8	17.0	8.8	1.36	.280	.000	.16	. . . . .
1454. .	Aug. 6, 1897	None. . . .	.00	000	139.2	1.6	1.8	.000	.004	.009	4.0	. . . . .
1455. .	. . do.	. . do. . . .	.00	000	140.8	1.7	.6	.000	.006	.008	4.0	. . . . .
3044. .	Aug. 10, 1897	Clear. . . .	.02	000	154.0	2.9	1.1	.002	.024	.023	3.6	. . . . .
3045. .	. . do.	. . do. . . .	.02	000	157.6	2.9	1.2	.002	.004	.014	3.6	. . . . .
3064. .	Dec. 13, 1897	. . do. . . .	.02	000	152.0	2.9	.9	.001	.014	.014	3.6	. . . . .
3200. .	Dec. 25, 1898	Slight. . .	. . . . .	000	. . . . .	2.0	. . . . .	. . . . .	. . . . .	.002	1.00	. . . . .
3202. .	. . do.	. . do. . . .	. . . . .	000	. . . . .	4.0	. . . . .	. . . . .	. . . . .	.085	1.8	. . . . .
3261. .	Feb 14, 1899	V slight.	.02	000	154.0	2.7	1.1	.000	.010	.003	3.4	. . . . .
3287. .	Feb. 18, 1899	. . do. . . .	.02	000	154.8	2.9	.9	.000	.012	.002	3.4	. . . . .
4960. .	April 25, 1899	. . do. . . .	.07	000	153.6	3.2	1.1	.001	.030	.016	2.8	. . . . .
4961. .	. . do.	. . do. . . .	.09	000	164.4	3.2	1.3	.002	.040	.160	2.75	. . . . .
14863. .	Aug. 29, 1906	Clear. . . .	.00	000	277.0	7.5	2.35	.012	.050	.200	1.12	157.1

Analysis of mineral content gave the following results:

LABORATORY NO. 15373, NOV. 19, 1906.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	11.1	Sodium nitrate	$NaNO_3$	15.8	.92
Ammonium, NH	.1	Sodium chloride	NaCl	11.6	.67
Magnesium, Mg	17.9	Sodium sulphate	Na_2SO_4	6.8	.40
Calcium, Ca	52.9	Ammonium sulphate	$(NH_4)_2SO_4$	.4	.02
Iron Fe	.6	Magnesium sulphate	$MgSO_4$	55.4	3.21
Aluminium, Al_2O_3	2.6	Magnesium carbonate	$MgCO_3$	23.2	1.35
Nitrate, NO_3	11.5	Calcium carbonate	$CaCO_3$	131.1	7.69
Chloride, Cl	7.0	Iron Carbonate	$FeCO_3$	1.2	.07
Sulphate, SO_4	49.1	Alumina	Al_2O_3	2.6	.15
Silica, SiO_2	8.5	Silica	SiO_2	8.5	.50
Bases	3.3	Bases		3.3	.19
			Total	259.9	13.17

Effingham, Effingham county, (3,774), is located on the Little Wabash river, from which the city water supply is obtained. The system is owned by private parties and was established in 1895. It is located on the banks of the river and compound Duplex pumps are used. The daily consumption is about 500,000 gallons.

For sanitary analysis, see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 14084, APRIL 28, 1896.

Ions.	Parts per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	2.5	Potassium nitrate	KNO_3	6.5	.38
Sodium, Na	9.3	Sodium nitrate	$NaNO_3$	3.6	.21
Magnesium, Mg	20.2	Sodium chloride	NaCl	7.4	.43
Calcium, Ca	27.7	Ammonium sulphate	$(NH_4)_2SO_4$	.4	.02
Ferrous, Fe	6.9	Sodium sulphate	Na_2SO_4	17.0	.99
Aluminium Al	7.9	Magnesium sulphate	$MgSO_4$	38.4	2.24
Silica, Si	3.8	Magnesium carbonate	$MgCO_3$	42.9	2.50
Nitrate, NO_3	6.6	Calcium carbonate	$CaCO_3$	69.2	4.03
Chloride, Cl	4.5	Ferrous carbonate	$FeCO_3$	14.3	.83
Sulphate, SO_4	42.4	Alumina	Al_2O_3	7.9	.46
		Silica	SiO_2	38.9	2.77
		Bases		11.0	.64
			Total	257.5	15.00

Eldorado, Saline county, (1,445) has no general supply.

Elgin, Kane county, (22,433), is located on Fox river, from which part of the city water supply is obtained. The major supply is obtained from deep wells, one 2,000 and three 1,300 feet deep. The system is owned by city. The water is pumped to reservoir by centrifugal pumps. The well water is treated by aeration and the mixed well and river water is filtered. The water bearing strata are St. Peter, 560 to 570 feet, and Madison 1,050 to 1,300 feet.

For sanitary analysis see the following table:

SANITARY EXAMINATION OF WATER FROM DEEP ARTESIAN WELLS AT ELGIN, ILLINOIS—CITY SUPPLY.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
9113	May 16, 1901	Decided.....	.02	Gassy	351.6	11.00	2.30	.624	.025	.000	.260	.....	.....	.....	.....	.....
9114	May 16, 1901	..do.....	.02	Gassy	380.0	13.00	1.80	.544	.006	.000	.190	.....	.....	.....	.....	.....
12909	Feb. 11, 1905	Consid'rab'e	.4	.000	365.0	4.7	2.65	1.840	.056	.000	.120	00	.....	.....	.....	.....
13787	Dec. 4, 1905	Decided.....	.4	2Earthy	391.0	2.5	3.7	.896	.144	.000	.400	164.6	.....	.....	.....	.....
14106	Mar. 12, 1906	..do.....	.3	Earthy	357.0	1.50	4.40	.920	.052	.000	.120	360.4	3	1—	2—	2—
14211	April, 10, 1906	...do.....	.3	3Earthy	346.0	1.40	3.8	1.000	.056	.000	.280	294.	2	1—	2—	2—
14327	May, 7, 1906	Slight.....	.2	.000	372.0	1.75	3.45	1.344	.118	.001	.320	293.8	0	1—	2—	2—
14508	June 11, 1906	Decided.....	.6	2Musty	355.0	5.0	4.25	.248	.118	.004	.008	333.7	5	1—	2—	2—
14614	July 11, 1906	Distinct....	1.0	.000	382.0	5.0	5.0	.240	.160	.001	.280	329.8	20	1—	2—	2—
14775	Aug. 13, 1906	Decided.....	.6	.000	377.0	5.0	3.9	2.600	.112	.000	.160	328.0	7	1—	.....	.....
15002	Sept. 18, 1906	..do.....	.3	.000	392.	5.5	3.5	2.00	.088	.002	.240	343.6	3	1—	2—	2—
15185	Oct. 16, 1906	..do.....	.6	.000	392.	4.0	4.85	1.84	.960	.002	.200	343.7	69	1 +	1 + 1—	2—
15345	Nov. 12, 1906	..do.....	.7	.000	366.0	5.0	3.6	2.640	.080	.000	.080	336.0	9	1—	2—	2—
15450	Dec. 10, 1906	..do.....	.6	.000	379.0	5.0	4.3	2.4	.080	.003	.120	343.7	0	1—	2—	2—

SANITARY EXAMINATION OF WATER FROM THE FOX RIVER AT ELGIN, ILLINOIS—CITY SUPPLY.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as—				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
1231	Aug. 7,1906	Slight	.15	.000	247.6	2.3	6.6	.030	.320	.000	.250					
6232	Nov. 6,1899	Distinct	.04	.000	324.	5.2	6.5	.020	.400	.001	.280					
8750	Nov. 6,1900	do.	Muddy.	.000	303.6	4.0	8.4	.136	.512	.006	.234					
8812	Nov. 22,1900	Slight	.2	.000	302.8	4.8	8.7	.070	.328	.004	.756					
10348	April 9,1902	Distinct	.3	.000	308.8	4.05	12.3	.038	.400	.010	.350					
10846	Jan. 12,1903	do.	.3	.000	396.4	4.5	11.	.064	.320	.016	1.064					
10866	Jan. 29,1903	Decided.	Muddy.	Musty.	365.2	4.2	9.6	.080	.304	.012	1.188					
19784	Dec. 4,1905	do.	.4	3Earthy	333.0	2.5	8.3	.116	.352	.004	.400	132.3				
19999	Feb. 12,1906	do.	.4	Earthy	320.0	3.00	11.35	.064	.184	.006	.554	269.6	20	1 +	2—	1 + 1 —
14107	Mar. 12,1906	Very decid'd	.5	do.	192.0	2.0	14.6	.084	.480	.006	.670	163.2	1,000	1 +	2—	2 —
14209	April 11,1906	Decided.	.5	3Earthy	293.0	2.75	13.05	.088	.448	.002	.280	200.0	14.900	1 +	2 +	1 + 1 —
14325	May 7,1906	Distinct	.4	.000	343.	2.0	13.8	.096	1.024	.002	.320	223.0	1,200	1 +	2 +	2 —
14509	June 11,1906	Decided.	Muddy.	3Earthy	354.0	3.0	6.0	.056	.608	.005	.200	225.0	1,500	1 +	2 +	2 +
14613	July 12,1906	do.	.4	Musty	296.0	3.5	14.0	.144	.576	.001	.44	197.8	230	1 +	2 —	2 —
14776	Aug. 13,1906	do.	.4	5Musty	310.0	2.5	12.65	.096	.608	.007	.480	209.5	690	1 +	1—1+	2 +
15003	Sept. 16,1906	do.	.3	.000	300.0	4.0	9.2	.160	.528	.010	.280	238.0	250	1?	2 +	1 + 1 —
15183	Oct. 26,1906	Slight	.3	.000	288.0	3.0	9.1	.040	.384	.004	.360	218.9	700	1 +	2 +	2 ?
15346	Nov. 12,1906	Decided	.2	2Musty	296.0	3.0	6.85	.064	.256	.001	.320	251.5	4.100	1—	2 +	2 —
15451	Dec. 10,1906	Slight	.4	.000	334.0	3.0	9.2	.040	.216	.005	.960	240.0	1,730	1—	1? 1—	2 —

SANITARY EXAMINATION OF WATER FROM FILTERS AT ELGIN WATER WORKS PLANT—CITY SUPPLY—ELGIN, ILLINOIS.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0. 1 c. c.
6233	Nov. 6, 1899	Slight.....	.02	000	287.2	5.0	4.8	.012	.240	.000	.280	.....	.....	.....	.....	.....
8749	Nov. 6, 1900	..do.....	.03	000	304.8	4.2	6.0	.124	.272	.000	.320	.....	.....	.....	.....	.....
10312	Mar. 10, 1902	..do.....	.30	000	238.0	4.1	9.4	.320	.464	.034	.086	.....	.....	.....	.....	.....
10335	Mar. 26, 1902	Clear.....	. 2	000	330.0	3.55	6.7	.040	.208	.042	2.358	.....	.....	.....	.....	.....
10336	..do.....	..do.....	. 2	000	322.8	3.65	7.1	.060	.224	.042	2.438	.....	.....	.....	.....	.....
10349	April 9, 1902	Slight.....	. 2	000	290.8	4.15	8.3	.028	.304	.003	.397	.....	.....	.....	.....	.....
10847	Jan. 12, 1903	Clear.....	. 2	000	383.6	4.4	8.6	.064	.272	.001	1.200	.....	.....	.....	.....	.....
10865	Jan. 29, 1903	..do.....	. 0	000	352.0	4.2	5.3	.084	.192	.007	1.073	.....	.....	.....	.....	.....
11137	June 11, 1903	..do.....	. 2	000	275.2	6.2	9.8	.008	.272	.000	.480	.....	.....	.....	.....	.....
13785	Dec. 4, 1905	Decided.....	. 4	Putrid.....	376.0	3.5	4.0	1.080	.192	.000	.240	161.7	.....	.....	.....	.....
13786	..do.....	..do.....	. 4	Earthy.....	473.0	3.5	3.75	.896	.186	.000	.240	162.7	.....	.....	.....	.....
13998	Feb. 13, 1906	Slight.....	. 0	000	363.0	2.0	4.55	1.12	.080	.000	1.400	352.8	180	1+1–	1 –	1 –
14000	Feb. 12, 1906	..do.....	. 2	000	332.0	4.0	6.5	.192	.136	.006	.354	287.2	25	1 –	2 –	2 –
14001	..do.....	Decided.....	. 4	000	368.0	4.0	3.4	.92	.146	.000	.200	332.6	122	1 –	2 –	2 –
14105	Mar. 12, 1906	..do.....	. 3	Earthy.....	360.0	4.0	4.7	.76	.254	.001	.320	342.8	32	1 –	2 –	2 –
14108	Mar. 12, 1906	Clear.....	. 2	..do.....	263.0	2.5	7.0	.224	.280	.008	.710	224.2	60	1 –	1+1–	2 –
14210	April 10, 1906	Decided.....	. 3	000	355.0	3.8	3.75	.864	.184	.000	.160	292.0	93	1 ?	2 –	2 –
14212	..do.....	..do.....	. 2	2 Earthy . . .	335.0	4.05	3.7	.832	.184	.001	.040	294.0	220	1 –	2 –	2 –
14326	May 7, 1906	Clear.....	. 3	3 Earthy . . .	342.0	3.0	5.75	.720	.240	.003	.160	264.1	860	1 +	2 –	2 –
14328	..do.....	Slight.....	. 3	000	369.0	3.5	3.4	.848	.158	.000	.160	264.1	168	1 –	2 –	2 –
14510	June 11, 1906	Distinct.....	. 2	2 Earthy . . .	359.0	3.5	7.3	.056	.280	.000	.200	234.7	620	1 ?	2 –	2 –
14511	..do.....	..do.....	1.0	..do.....	358.0	4.5	6.8	.048	.280	.000	.200	230.9	230	1 +	1+1–	2 –
14615	July 11, 1906	Clear.....	. 2	000	335.0	3.5	7.5	.032	.256	.014	.320	232.8	.....	.....	.....	.....
14616	..do.....	000	. 3	000	321.0	3.5	7.35	.080	.280	.014	.480	230.8	70	1 –	2 –	2 –
14773	Aug. 13, 1906	Clear.....	. 1	000	306.0	3.0	5.85	.072	.206	.065	.290	217.2	250	1 +	2 +	1 ? 1 +
14774	..do.....	..do.....	. 0	000	297.0	3.5	5.75	.064	.210	.070	.330	221.1	180	1 +	2 –	2 –
15004	Sept. 18, 1906	..do.....	. 3	000	300.0	3.0	5.75	.024	.216	.000	.440	232.3	149	2 –	2 –	1 ? 1 –

Sanitary Examination Elgin. Water Supply—Concluded.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bactaria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
15005	Sept. 18, 1906	Clear........	.3	000	296.0	3.0	6.0	.024	.248	.002	.480	230.4	64	1?	2+	2–
15182	Oct. 16, 1906	..do..........	.0	000	294.0	2.0	7.0	.040	.190	.002	.480	217.0	45	1+	1+1–	2–
15184	..do..........	..do..........	.2	000	296.0	3.0	6.95	.012	.212	.000	.520	229.5	0	1–	2–	2–
15347	Nov. 12, 1906	..do..........	.0	000	296.0	3.0	5.15	.064	.184	.005	.360	243.8	133	1+	1+1–	2–
15348	..do..........	..do..........	.0	000	296.0	3.0	5.3	.072	.184	.006	.400	241.9	165	1+	1+1–	2–
15448	Dec. 10, 1906	..do..........	.2	000	352.0	3.0	6.15	.640	.160	.003	.360	276.5	220	1+	2–	1?1–
15449	..do..........	..do..........	.2	000	356.0	3.0	6.2	.832	.160	.003	.560	286.1	200	1+	2–	2–

Mineral analysis is as follows:

Amounts stated in Parts per Million.

Ions.	13784 Fox River Raw	13785 Deep Wells	13894 Fox River Raw	13895 Deep Wells	13999 Fox River Raw	14509 Fox River Raw	14511 Fox River Filtered
Potassium, K	4.2	10.0	1.9	8.1	3.3	*.....	.....*
Sodium, Na	6.5	21.3	3.1	31.0	6.0	8.1	7.6
Ammonium, (NH_4)	.....	1.4	1.2	1.0	.1	.1	1
Magnesium, Mg	35.2	27.5	21.1	28.9	31.2	38.6	41.7
Calcium. Ca	66.7	66.9	50.9	53.7	50.2	53.5	60.4
Ferrous, Fe	.5	.5	.9	.6	.9	1.6	1.1
Aluminium, Al	1.2	1.3	.7	.5	1.4	15.9	1.5
Nitrate, NO_3	1.7	1.0	3.0	.9	2.4	.9	.9
Chloride, Cl	2.5	3.5	2.0	2.0	3.0	3.0	4.5
Sulphate, SO_4	35.5	8.2	29.2	2.8	45.2	25.2	76.4
Silica, SiO_2	11.1	10.0	12.3	12.1	13.2	23.9	1.7

Amounts stated in Parts per Million.

Hypothetical Combinations.		13784	13785	13894	13895	13999	14509	14511
Potassium nitrate,	KNO_3	2.8	1.7	4.9	1.5	3.9	....	....
Potassium chloride,	KCl	5.9	7.4	....	4.2	3.4	....	....
Potassium sulphate.	K_2SO_4	....	12.2	....	5.1	....	....	....
Potassium carbonate,	K_2CO_3	....	....	....	5.3	....	....	....
Sodium nitrate,	$NaNO_3$	....	....	....	....	....	1.2	1.2
Sodium chloride,	NaCl	....	....	3.3	....	2.3	5.0	7.4
Sodium sulphate,	Na_2SO_4	19.9	2.1	5.5	....	15.7	17.9	13.6
Sodium carbonate	Na_2CO_3	....	54.5	....	71.3	....	....	....
Ammonium sulphate,	$(NH_4)_2SO_4$	....	....	4.4	....	.4	.4	.4
Ammonium carbonate,	$(NH_4)_2CO_3$	....	3.7	....	27	....	....	....
Magnesium sulphate,	$MgSO_4$	27.6	....	28.0	....	43:0	16.0	83.9
Magnesium carbonate,	$MgCO_3$	103.5	95.6	36.5	100.1	77.9	122.6	85.5
Calcium carbonate,	$CaCO_3$	166.6	164.7	127.1	134.0	150.3	133.5	150.8
Ferrous carbonate,	$FeCO_3$	1.1	1.0	1.9	1.2	1.9	3.3	2.3
Alumina,	Al_2O_3	2.2	2.5	1.4	.9	2.7	15.9	2.8
Silica,	SiO_2	11.1	10.0	12.3	12.1	13.2	23.9	1.7
Bases,	.....	....	....	....	....	....	11.3	1.6
Total		340.7	356.4	225.3	338.4	314.6	351.0	351.2

Amounts stated in Grains per U. S. gallon.

Hypothetical Combinations.		13784	13785	13894	13895	13999	14509	14511
Potassium nitrate,	KNO_3	.16	.10	.29	.09	.23	....	....
Potassium chloride,	KCl	.34	.43	....	.25	.20	....	....
Potassium sulphate,	K_2SO_4	....	.71	....	.30	....	....	....
Potassium carbonate,	K_2CO_3	....	....	....	.31	....	....	....
Sodium nitrate,	$NaNO_3$	....	....	....	....	....	.07	.07
Sodium chloride.	NaCl	....	....	.19	....	.13	.29	.43
Sodium sulphate,	Na_2SO_4	1.15	.12	.32	....	.92	1.04	.79
Sodium carbonate,	Na_2CO_3	....	3.18	....	4.16	....	....	....
Ammonium sulphate,	$(NH_4)_2SO_4$	....	....	.26	....	.02	.02	.02
Ammonium carbonate,	$(NH_4)_2CO_3$	....	.22	....	.16	....	....	....
Magnesium sulphate,	$MgSO_4$	1.62	....	1.63	....	2.51	.93	4.89
Magnesium carbonate,	$MgCO_3$	6.03	5.58	2.13	5.84	4.54	7.15	4.99
Calcium carbonate,	$CaCO_3$	9.72	9.60	7.41	7.82	8.77	7.79	8.80
Ferrous carbonate,	$FeCO_3$	.06	.06	.11	.07	.11	.19	.13
Alumina,	Al_2O_3	.13	.15	.08	.05	.16	.93	.16
Silica,	SiO_2	.65	.58	.72	.71	.71	1.39	.10
Bases,	.....	....	....	....	....	....	.66	.09
Total		19.86	20.73	13.14	19.76	18.36	20.46	20.47

*Potassium and sodium were not separated.

ANALYSES OF WATER FROM FOX RIVER IN ELGIN, ILLINOIS, AUGUST 1st TO DECEMBER 31st. 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended Matter.	Total solids.	Silica SiO_2	Iron Fe	Aluminium. Al.	Calcium, Ca	Magnesium, Mg	Sodium and Potassium, Na	Bi-Carbonate, HCO_3	Sulphate, SO_4	Chlorine, Cl	Nitrate, NO_3
1901	Aug.	3-10	110	39	304	26	.2	....	42	36	11	304	27	6.	2.5
1902	.. do	11-20	30	8.4	270	15	.1	....	40	35	10	240	31	4.7	3.4
1903	.. do	21-30	50	30	280	10	.06	....	44	34	19	252	31	7.	3.
1904	.. do	31-8	50	7	264	12	.05	....	41	34	17	291	29	6.5	1.2
1905	Sep	11-19	50	31	234	9.4	.2	....	32	35	14	260	29	5.	1.8
1906	.. do	20-29	40	30	265	9.4	.03	....	43	29	10	273	25	6.5	2.0
1907	.. do	30-9	40	20	252	7.0	.03	....	43	34	11	254	49	5.	1.7
1908	Oct	10-18	20	15	265	5.8	.08	....	42	35	7.7	270	31	5.5	1.2
1909	.. do	20-29	30	21	285	8.2	.05	....	51	37	19	300	33	7.2	.6
1910	Nov	1-8	20	10	306	10	.04	....	51	35	10	316	37	7.5	1.5
1911	.. do	9-19	10	4.4	289	6.0	.03	....	50	33	13	310	36	5.5	1.2
1912	.. do	20-30	15	13	293	8.6	.03	....	57	37	14	300	45	7.	3.
1913	Dec	1-10	10	5.2	315	11	.06	....	55	27	12	300	51	7.5	4.
1914	.. do	11-20	10	24	348	10	.13	....	62	37	8.8	309	47	6.5	2.5
1915	.. do	21-31	5	9.6	373	9.2	.12	....	65	39	13	366	53	5.5	3.5
Average	.....	.....	33	17.8	290	11	.81	....	47	35	12.6	290	37	6.2	2.2

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	3.0	.17
Sodium chloride,	NaCl	10.2	.59
Sodium sulphate,	Na_2SO_4	24.1	1.14
Magnesium sulphate,	$MgSO_4$	25.9	1.51
Magnesium carbonate,	$MgCO_3$	103.2	6.01
Calcium carbonate,	$CaCO_3$	117.3	6.83
Iron carbonate,	$FeCO_3$	1.7	.10
Alumina,	Al_2O_3	.....	.....
Silica,	SiO_2	11.7	.64
Total		296.4	17.26

Elmhurst, DuPage county, (1,728), obtains its water supply from Mammoth Spring, three miles south of the town.

For sanitary analysis, see final table.

Analysis of the mineral content gave the following results:

LABORATORY NO. 4349.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon
Potassium, K	.8	Potassium nitrate	KNO_3	2.4	.14
Sodium, Na	11.7	Potassium chloride	KCl	1.7	.10
Magnesium, Mg	40.4	Potassium sulphate	K_2SO_4	2.1	.12
Calcium, Ca	97.2	Sodium sulphate	Na_2SO_4	25.9	2.09
Ferrous, Fe	.6	Magnesium sulphate	$MgSO_4$	85.0	4.96
Aluminium, Al	1.7	Magnesium carbonate	$MgCO_3$	81.0	4.72
Silicon, Si	2.2	Calcium carbonate	$CaCO_3$	242.8	14.16
Nitrate, NO_3	1.5	Ferrous carbonate	$FeCO_3$	1.3	0.7
Chloride, Cl	.8	Alumina	Al_2O_3	3.2	.18
Sulphate, SO_4	93.2	Silica	SiO_2	4.6	.27
			Total	460.	26.81

Elmwood, Peoria county, (1,582), obtains its water supply from wells 1300 feet deep. The system is owned by the city and was established in 1895 at a cost of $20,000. Two Dean pumps and one Cook deep well pump are used. The daily consumption is 35,000 gallons.

El Paso, Woodford county (1,441), obtains its water supply from wells 110 feet deep. The system is owned by the city and was established in 1890.

For sanitary analysis, see final table.

Eureka, Woodford county (1,661), is located on Walnut creek and the Mackinaw river. The water supply is obtained from a well ninety feet deep. The system is owned by the city and was established in 1905. One single plunger deep well pump and one triplex fire pump, with a daily capacity of 300,000 gallons, are used. The daily consumption is 20,000 gallons.

Evanston, Cook county (19,259, estimated 23,000), is located on Lake Michigan, from which the city water supply is obtained. The system is owned by the city and was established in 1873. The plant is located on the lake shore, north of the city. Three Holly pumps are used, with capacities of 2,000,000, 5,000,000 and 12,000,000 gallons, respectively. The water is not treated. The daily consumption is about 6,200,000.

For sanitary analysis see the following table:

SANITARY EXAMINATION OF WATER FROM LAKE MICHIGAN–UNFILTERED—TAP, CITY HALL–CITY SUPPLY OF EVANSTON.

Serial number.	Date of collection.	Appearance.				Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
									ammonia.			
		Turbidity	Sediment.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
2811	Oct. 18, 1897	Distinct...	Lit..	.04	00	152.4	3.0	3.5	.012	.140	.002	.050
2971	Nov. 24, 1897	..do.....	Cons.	.10	00	300.0	3.0	8.3	.612	.360	.000	.200
3001	Nov. 29, 1897	Slight....	Lit..	.03	00	134.8	2.7	2.5	.001	.068	.000	.400
3104	Dec. 28, 1897	..do.....	..do..	.04	00	144.0	3.0	2.9	.001	.076	.000	.150
3868	July 25, 1898	..do.....	..do..	.02	00	136.4	3.1	2.9	.001	.068	.000	.100
4122	Sept. 26, 1898	Distinct....	..do..	.03	00	159.2	3.1	2.9	.002	.118	.000	.040
4161	Oct. 3, 1898	Slight.....	..do..	.02	00	142.8	3.1	2.1	.004	.082	.000	.200
4162	Oct. 3, 1898	..do.....	..do..	.02	00	138.8	3.1	2.0	.006	.072	.000	.150
4192	Oct. 11, 1898	..do.....	..do..	.03	00	136.8	2.9	2.4	.014	.084	.000	.300
4234	Oct. 20, 1898	Distinct....	..do..	.06	00	161.2	3.0	3.0	.012	.017	.002	.250
4296	Nov. 1, 1899	..do.....	..do..	Muddy...	00	242.0	3.0	4.5	.010	.019	.004	.300
4365	Nov. 14, 1898	..do.....	Cons.	..do.....	00	178.0	3.4	3.0	.006	.066	.005	.150
4440	Nov. 30, 1898	Decided....	..do..	..do.....	00	194.8	4.8	3.7	.072	.082	.030	.300
4529	Dec. 22, 1898	Slight.....	Lit..	.05	00	164.0	3.4	2.4	.004	.068	.000	.100
11854	Mar. 7, 1904	V.slight...	V.lit.	.00	00	152.0	3.3	3.0	.018	.120	.000	.160
11876	Mar. 16, 1904	Distinct...	Lit..	.10	00	164.4	3.1	3.3	.012	.130	.000	.160
11891	Mar. 21, 1904	V. slight. .	V.lit.	.00	00	132.0	3.0	2.9	.020	.092	.000	.120
11918	Mar. 28, 1904	Slight.....	..do..	.10	00	146.8	3.1	3.0	.026	.114	.001	.120
11951	April 8, 1904	Distinct....	Lit..	Muddy...	00	162.4	3.1	4.3	.030	.163	.000	.080
11991	April 25, 1904	.....	.....		00	161.6	3.0	4.7	.012	.130	.002	.160
12021	May 5, 1904	Decided...	Cons.	Muddy...	00	210.4	3.1	5.5	.016	.152	.002	.160
11960	April 11, 1904	Distinct...	Lit..	.10	Pecu.	147.2	1.25	2.9	.018	.132	.001	.200
12060	May 17, 1904	Decided...	Cons.	Muddy...	00	160.8	3.6	3.8	.010	.116	.000	.120
12078	May 30, 1904	..do.....	..do..	..do.....	00	352.0	9.3	4.5	.220	.172	.075	2.325
12106	June 1, 1904	Distinct...	..do..	.20	00	172.8	3.0	3.5	.048	.142	.000	.080
12178	June 21, 1904	Decided...	..do..	Muddy...	00	217.2	3.2	4.2	.034	.....	.000	.160
12195	.....	Distinct....	Lit..	.00	00	147.6	3.05	3.5	.060	.....	.000	.160
12253	July 20, 1904	Slight.....	V.lit.	.00	Gas..	144.4	2.95	4.1	.042	.170	.000	.120
12271	July 25, 1904	Decided...	Cons.	Muddy...	Mus..	164.8	3.1	3.9	.044	.152	.000	.160
12295	Aug. 1, 1904	Distinct...	..do..	.00	00	170.0	2.9	2.6	.038	.126	.000	.160
12350	Aug. 16, 1904	Decided...	..do..	Muddy...	00	270.8	2.95	4.6	.040	.188	.000	.129
12380	Aug. 25, 1904	..do.....	..do..	..do.....	00	234.8	3.3	5.6	.008	.208	.000	.040
12395	Aug. 30, 1904	..do.....	Much	..do.....	00	280.0	3.0	3.3	.028	.170	.000	.360
12410	Sept. 6, 1904	..do.....	Cons.	..do.....	00	264.0	3.2	4.7	.034	.294	.000	.320
12498	Sept. 26, 1904	..do.....	Much	..do.....	00	182.4	3.35	5.8	.044	.336	.002	.278
12513	Oct. 3, 1904	..do.....	..do..	..do.....	00	238.0	3.25	7.8	.012	.216	.002	.320
12532	Oct. 10, 1904	..do.....	Cons.	..do.....	Mus..	196.0	3.25	2.9	.042	.220	.002	.440
12566	Oct. 20, 1904	..do.....	..do..	..do.....	00	183.6	3.3	3.4	.036	.166	.000	.200
12604	Oct. 31, 1904	..do.....	..do..	..do.....	00	172.4	3.05	5.6	.036	.210	.000	.080
12641	Nov. 10, 1904	Distinct...	..do..	.00	00	162.0	3.2	3.8	.020	.148	.000	.080
12672	Nov. 18, 1904	..do.....	..do..	Muddy...	00	179.2	3.25	3.1	.056	.120	.001	.160
12701	Nov. 29, 1904	.....	.....	.....	.....	178.0	3.15	4.0	.012	.106	.000	.240
12752	Dec. 15, 1904	.....	.....	.....	.....	168.0	3.25	3.2	.032	.....	trace.	.160
12792	Dec. 27, 1904	.....	.....	.....	.....	161.2	3.15	3.2	056	.110	.002	.200

SANITRY ANALYSIS OF WATER FROM LAKE MICHIGAN–UNFILTERED–EVANSTON CITY SUPPLY–TAP, CITY HALL. 1905.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0,1 c. c.
12815	Jan. 6,1905	Decided	Mud ...	000	177.6	3.6	3.2	.052	.116	.002	.120	.....	.....	.....	.....	.....
12829	Jan. 10,1905	.....	.....	.....	240.8	3.2	4.4	.042	.194	.007	.160	.....	.....	.....	.....	.....
12847	Jan. 6,1905	.....	.....	.....	210.4	3.3	3.55	.044	.156	.002	.240	.....	.....	.....	.....	.....
12865	Jan. 24,1905	.....	.....	.....	142.8	2.7	2.5	.028	.066	.001	.200	.....	.....	.....	.....	.....
12882	Jan. 31,1905	.....	.....	.....	176.4	3.15	3.25	.038	.114	.001	.200	.....	.....	.....	.....	.....
12896	Feb. 6,1905	Sample lost	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12910	Feb. 15,1905	.....	.....	.....	190.0	3.4	3.85	.042	1.48	.002	.240	.....	.....	.....	.....	.....
12920	Feb. 21,1905	.....	.....	.....	154.8	3.7	2.55	.036	.088	.002	.240	.....	.....	.....	.....	.....
12941	Feb. 27,1905	.....	.....	.....	162.4	3.5	3.25	.068	.130	Trace....	.200	.....	.....	.....	.....	.....
12958	Mar. 6,1905	.....	.....	.....	176.4	3.45	4.00	.038	.140	.000	.160	.....	.....	.....	.....	.....
12985	Mar. 16,1905	.....	.....	.....	156.	3.5	2.8	.054	.100	.001	.240	.....	.....	.....	.....	.....
13003	Mar. 21,1905	.....	.....	.....	148.	3.3	2.65	.030	.106	.002	.200	.....	.....	.....	.....	.....
13049	April 3,1905	.....	.....	.....	195.6	3.9	5.2	.050	.216	.002	.360	.....	.....	.....	.....	.....
13071	April 11,1905	.....	.....	.....	150.4	3.45	3.7	.052	.132	.000	.200	.....	.....	.....	.....	.....
13096	April 21,1905	.....	.....	.....	162.4	3.4	3.85	.054	.164	.001	.240	.....	.....	.....	.....	.....
13124	May 3,1905	.....	.....	.....	208.4	3.3	6.3	.046	.208	.002	.200	.....	.....	.....	.....	.....
13141	May 10,1905	.....	.....	.....	152.4	3.1	3.0	.020	.136	Trace....	.200	.....	.....	.....	.....	.....
13206	May 31,1905	.....	.....	.....	240.4	3.15	4.2	.038	.202	.002	.200	.....	.....	.....	.....	.....
13235	June 12,1905	.....	.....	.....	265.6	3.15	3.9	.032	.176	.000	.240	.....	.....	.....	.....	.....
13265	June 20,1905	.....	.....	.....	301.6	2.95	5.4	.058	.216	.000	.240	.....	.....	.....	.....	.....
13307	July 5,1905	.....	.....	.....	147.6	3.7	2.9	.038	.084	Trace....	.160	.....	.....	.....	.....	.....
13429	Aug. 9,1905	.....	.....	.....	330.4	2.95	5.6	.050	.228	.000	.160	.....	.....	.....	.....	.....
13515	Sept. 11,1905	.....	.....	.....	162.8	2.95	2.75	.038	.138	.001	.239	.....	.....	.....	.....	.....
13602	Sept. 25,1905	.....	.....	.....	458.	2.7	15.6	.032	.226	.000	.160	.....	.....	.....	.....	.....
13617	Oct. 2,1905	.....	.....	.....	202.	2.8	3.95	.032	.178	.001	.240	.....	.....	.....	.....	.....
13658	Oct. 9,1905	.....	.....	.....	182.	2.2	4.5	.026	.152	.000	.160	.....	2950	1+	2+	2—
13668	Oct. 16,1905	.....	.....	.....	143.	3.15	4.1	.046	.128	.001	.32	.....	.....	.....	.....	.....
13679	Oct. 23,1905	000	.....	.....	157.	3.5	4.45	.082	.148	.000	.012	.....	.....	.....	.....	.....
13706	Oct. 20,1905	.....	.....	.....	174.	2.9	3.30	.036	.122	.001	.160	.....	.....	.....	.....	.....

Sanitary Analysis of Water from Lake Michigan—Concluded.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
								Free.	Albuminoid.							
13720	Nov. 6, 1905	.....	.....	.....	118.	3.15	4.1	.012	.145	.000	.200	.....	1560	1+	1+	2 +
13739	Nov. 13, 1905	Decided	000	000	130.	4.0	2.75	.020	.124	.000	.320	115.6	.....	.....	.....	.....
13769	Nov. 22, 1905	Slight	00	000	149.0	3.5	2.05	.044	.114	.000	.240	119.5	.....	.....	.....	.....
13798	Dec. 4, 1905	Decided	.1	2Earthy	194.	3.0	4.05	.042	.122	.004	.24	121.6	8940	1+	1+	1—
13818	Dec. 12, 1905	..do.....	00	000	165.	3.0	4.3	.042	.178	.003	.20	117.6	.....	.....	.....	.....
13849	Dec. 19, 1905	..do.....	Mud ...	3Earthy	277.	3.5	6.55	.014	.202	.001	.28	119.0	.....	.....	.....	.....

SANITARY EXAMINATION OF WATER FROM LAKE MICHIGAN–UNFILTERED–TAP, CITY HALL–EVANSTON CITY SUPPLY. 1906.

Serial number	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
13885	Jan. 2, 1906	Slight.....	.000	.000	158.	3.0	2.9	.050	.118	.000	.200	117.4	11230	1—	.....	.....
13916	Jan. 15, 1906	Clear.....	.000	.000	172.	3.5	3.65	.014	.112	.001	.200	74.8	647	1—	2+	1+1—
13949	Jan. 29, 1906	Decided.....	Cons....	.00	192.	3.5	3.85	.040	.130	.001	.240	117.4	.....	.....	.....	.....
13973	Feb. 5, 1906	Decided.....	.00	.00	196.	4.5	4.15	.032	.122	.001	.20	136.0	.....	.....	.....	.....
14012	Feb. 14, 1906	Decided.....	.00	.00	222.	4.5	5.00	.072	.150	.001	.320	143.6	.....	1—	2+	2—
14023	Feb. 19, 1906	Decided.....	Mud....	Ear.	188.	2.5	3.3	.086	.122	.002	.200	131.0	1400	1+	1+1—	2—
14062	Feb. 28, 1906	Decided.....	Mud....	.00	241.	2.0	5.35	.080	.174	.002	.240	146.2	1500	1+	2+	2—
14074	Mar. 5, 1906	Decided.....	.8	.00	253.	2.5	5.4	.102	.172	.003	.290	136.0	5800	1—	2+	2+
14103	Mar. 13, 1906	Decided.....	Mud....	Ear.	304.	4.5	6.7	.062	.236	.004	.360	138.6	940	1+	1+1—	2—
14104	Mar. 13, 1906	Decided.....	Mud.....	Ear.	251.	4.0	5.5	.066	.216	.004	.360	136.0	500	1—	2+	2—
14141	Mar. 26, 1906	Decided.....	.2	Ear.	153.	4.0	2.8	.036	.118	.000	.20	106.4	10	1—	2—	2—
14161	April 3, 1906	Decided.....	.2	.00	201.	2.5	4.6	.048	.206	.001	.280	114.0	540	1+	1+	2—
14199	April 9, 1906	Decided.....	.....	5Ear.	188.	3.95	4.05	.050	.160	.002	.240	112.	1840	1—	2+	2—
14224	April 16, 1906	Decided.....	.000	.00	218.	3.3	4.45	.066	.220	.001	.160	112.0	4000	1+	1+1—	.....
14242	April 23, 1906	V. Decided..	.00	4Ear.	214.	2.0	4.75	.030	.188	.000	.200	106.4	2100	1+	2+	1+1—
14318	May 7, 1906	Decided.....	.00	.00	300.	3.0	3.75	.048	.174	.000	.280	118.	1590	1?	1+1—	2—
14358	May 14, 1906	Decided.....	.00	Veg.	158.	4.0	3.8	.046	.174	.000	.200	104.	356	1+	2—	2—
14406	May 21, 1906	Decided.....	.00	.00	214.	3.5	5.2	.036	.216	.001	.31	111.6	640	1+	2+	2—
14452	May 28, 1906	Decided.....	.00	.00	229.	5.0	4.25	.038	.140	.000	.120	102.	5500	1+	2+	1+1—
14518	June 13, 1906	Decided.....	Mud....	3Ear.	313.	3.5	5.4	.040	.174	.000	.200	116.4	1150	1—	2—	2—
14582	July 3, 1906	Distinct.....	.2	.00	176.	4.5	3.95	.016	.160	.001	.680	116.4	2100	1+	2+	2+
14592	July 9, 1906	Distinct.....	.2	.00	196.	5.0	4.35	.080	.216	Trace	.200	114.4	800	1+	1+1—	2—
14632	July 16, 1906	Slight.....	.2	.00	208.	4.5	3.9	.040	.128	.000	.240	116.4	320	1+	2—	2—
14817	Aug. 20, 1906	V. Slight....	.00	.00	165.	5.0	3.3	.050	.130	.001	.280	114.4	70	1+	2—	2—
14865	Aug. 28, 1906	Clear.....	Lit....	.00	164.	3.0	3.45	.006	.088	.000	.200	107.5	500	1+	2+	1+1—
15000	Sept. 18, 1906	Decided.....	.00	.00	173.	5.0	2.55	.010	.080	.001	.200	128.6	163	1+	1+1—	2+
15001	Sept. 18, 1906	Clear.....	.00	.00	153.	4.5	2.75	.010	.064	.000	.280	119.	61	1+	1? 1—	2—
15160	Oct. 15, 1906	Decided.....	.00	.00	145.	3.0	3.05	.018	.132	.003	.360	115.2	1260	1—	2+	1—1+
15210	Oct. 22, 1906	Decided.....	.1	.00	172.	2.5	3.95	.022	.124	.024	.200	117.1	470	1—	2+	2—
15349	Nov. 12, 1906	Decided.....	.1	.00	157.	4.0	3.3	.018	.120	.000	.160	117.1	135	1+	1+1—	2—
15437	Dec. 10, 1906	Decided.....	.00	.00	170.	4.0	3.45	.020	.102	.000	.160	111.4	20	1—	1+1?	2+

SANITARY EXAMINATION OF WATER FROM FILTER AT EVANSTON CITY HALL—SOURCE, LAKE MICHIGAN. Dec. 1, 1905 to Jan. 1, 1907.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
								Free.	Albuminoid.							
*13799	Dec. 4,1905	Clear.....	.00	.00	.....	.....	.....	.....	.....	.....	.....	.....	35	.....	2—	.....
13850	Dec. 19,1905	..do.....	.00	3Earthy	141.	3.0	3.3	.010	.070	.000	.200	119.0	.....	.....	.....	.....
13886	Jan. 2,1906	..do.....	.00	.00	155.	3.0	2.35	.066	.070	.000	.320	119.0	10,895	.....	.....	.....
13917	Jan. 15,1906	..do.....	.00	.00	153.	3.0	2.05	.028	.076	.000	.200	112.2	20	1—	2—	2—
13950	Jan. 29,1906	..do.....	.00	.000	158.	3.5	2.8	.028	.106	.001	.240	119.0	.....	.....	.....	.....
14013	Feb. 14,1906	..do.....	.00	.00	164.	3.5	3.6	.048	.076	.000	.360	139.6	.....	.....	2—	.....
14024	Feb. 19,1906	..do.....	.00	.00	167.	1.5	3.1	.026	.072	.000	.200	128.6	150	1—	2—	2—
14063	Feb. 28,1906	..do.....	.00	.00	157.	2.0	2.75	.050	.096	.000	.240	137.0	50	1—	2—	2—
14075	Mar. 5,1906	..do.....	.00	.00	151.	2.5	3.2	.032	.108	.000	.560	133.6	350	1—	2—	2—
14142	Mar. 26,1906	None.....	.00	Earthy	150.	4.0	2.7	.026	.092	.000	.240	106.4	110	1 +	1 +	2—
															1—	
14162	April 2,1906	Clear.....	.00	.00	142.	3.5	2.2	.014	.126	.000	.240	114.0	9	1—	2—	2—
*14198	April 9,1906	.....	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,700	1—	2—	1—
14359	May 14,1906	..do.....	.00	.00	126.	5.0	2.8	.038	.124	.000	.240	104.0	47	1—	2—	2—
14453	May 28,1906	..do.....	.00	.00	166.	5.5	2.15	.046	.072	.000	.160	107.	6	1—	2—	2—
14593	July 9,1906	..do.....	.1	.00	135.	4.5	2.6	.016	.072	.000	.16	114.4	2,000	1—	2—	2—
14633	July 16,1906	..do.....	.1	.00	142.	5.0	1.75	.016	.048	.002	.44	124.0	140	1—	2—	2—
14866	Aug. 28,1906	..do.....	.00	.00	147.	3.0	2.4	.004	.058	.000	.200	115.2	110	1—	2—	2—
15161	Oct 15,1906	..do.....	.00	.00	142.	3.5	2.8	.024	.086	.000	.240	115.2	207	1 +	1?	2—
															1—	
15211	Oct. 22,1906	..do.....	.00	.00	146.	3.0	3.65	.028	.078	.000	.320	117.1	85	1—	2—	2—
15350	Nov. 12,1906	V. slight....	.00	.00	134.	6.0	2.25	.016	.106	.000	.200	119.0	155	1—	2—	2—

*Bacteriological only.

Mineral analysis would show same results as Lake Michigan.

Fairbury, Livingston county (2,187), obtains its water supply from a well 2,000 feet deep in sandstone. The system was established in 1890 at a cost of $20,000 and is owned by the city. An air lift pump is used. The daily consumption is about 100,000 gallons.

Fairfield, Wayne county (2,338), obtains its water supply from an artificial lake or reservoir. The system is owned by a company and was established in 1897.

Farmer City, DeWitt county (1,664), obtains its supply from an artesian well 176 feet deep. The system is owned by the city and was established in 1894 at a cost of $16,000. A Downie deep well double acting pump is used. The daily consumption is 50,000 gallons. For sanitary analysis see final table.

Analysis of the mineral content gave the following results:

LABORATORY NO. 3686, JUNE 14, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	3686.			3,686	3,686
Potassium, K	6.5	Potassium nitrate,	KNO_3	1.5	.08
Sodium, Na	185.3	Potassium chloride,	KCl	11.2	.65
Ammonium, (NH_4)	4.1	Sodium chloride,	NaCl	185.7	10.83
Magnesum, Mg	24.4	Sodium sulphate,	Na_2SO_4	3.5	.20
Calcium, Ca	58.6	Sodium carbonate,	Na_2CO_3	255.1	15.14
Ferrous, Fe	1.9	Ammonium carbonate,	$(NH_4)_2CO_3$	10.9	.64
Aluminium, Al	.4	Magnesium carbonate,	$MgCO_3$	85.0	4.95
Silicon, Si	7.1	Calcium carbonate,	$CaCO_3$	146.4	8.53
Nitrate, NO_3	.9	Ferrous carbonate,	$FeCO_3$	3.9	.22
Chloride, Cl	118.	Alumina,	Al_2O_3	.7	.04
Sulphate, SO_4	2.4	Silica,	SiO_2	15.1	.87
		Total		719.0	42.15

Farmington, Fulton county (1,729), obtains its water supply from a well 1,465 feet deep. The system is owned by the city and was established in 1894.

Flora, Clay county (2,311), has no general water supply. The report says one is needed and that a sewer system is also badly needed.

Forreston, Ogle county [?],047), obtains its water supply from a well 300 feet deep. The system is owned by the city and was established in 1890.

Fort Sheridan, Lake county, (1,575), is located on Lake Michigan and obtains its water supply from the lake. The system is owned by the United States government and was established in 1889.

Freeburg, St. Clair county, (1,214), obtains its water supply from a lake. The system is owned by the city and was established in 1898.

Freeport, Stevenson county, (13,258), is located on the Pecatonica river. The city water supply is obtained from wells in the drift. The system is owned by the Freeport Water Company and was established in 1882 at a cost of $232,000. The pumps are horizontal, compound crank and fly wheel. The daily consumption is 1,235,000 gallons. The water is treated with lime and filtered.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF FREEPORT.

Serial number.	Date of collection	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.	
								Free.	Albuminoid.			
17	Sept. 17, 1895	None.	None	.000	204.	.6	.066	.040	trace	2.9	.....	.....
27	Sept. 27, 1895	..do.	..do.	.000	382.6	.9	.000	.022	0.00	1.7	.....	.....
199	Nov. 14, 1895	.....	.....	.....	372.8	.....	.....	.....	.....	.....	.....	.....
200	Nov. 14, 1895	.....	.....	.....	530.4	.....	.....	.....	.....	.....	.....	.....
373	Jan. 14, 1896	.....	.....	.....	328.4	3.1	1.9	.000	1.238	.....	.....	.....
553	Mar. 7, 1896	.....	.....	.....	410.8	1.3	.5	.000	.04	.....	.....	.....
1511	Oct. 16, 1896	None.	.03	.000	380.8	12.0	1.4	.014	.02	.009	2.7	.....
1545	Oct. 24, 1896	..do.	.02	.000	368.0	12.5	1.0	.024	.022	.006	2.8	.....
2629	Sept. 5, 1897	.....	.03	.000	386.0	13.0	1.7	.062	.064	.068	.23	.....
10034	Dec. 10, 1901	Clear.	.01	.000	352.2	10.	2.	.012	.022	.012	1.508	.....
15220	Oct. 22, 1906	Clear.	.0	.0	886.	117.	2.7	.006	.046	.000	43.00	378.2
15222	Oct. 22, 1906	..do.	.0	.0	461.	19.	1.5	.006	.046	.001	4.48	364.8

Fulton, Whiteside county (2,685), is located on the Mississippi river. The municipal supply is obtained from an artesian well 1,204 feet deep. The plant is owned by the city and was established in 1888 at a cost of $35,000. A Smith-Vaile pump, with 30,000 gallons per hour capacity, is used, and the daily consumption is 70,800 gallons. The water is not treated.

Galena, JoDaviess county (5,005), located on the Galena river, obtains its water supply from an artesian well 500 feet deep. The system is owned by the Galena Water Company and was established in 1879.

Galesburg, Knox county (18,607, estimated 25,000), obtains it water supply from two artesian wells 1,240 feet deep and forty-two wells eighty feet deep. The system is owned by the city and was established in 1887 at a cost (to date) of $277,302.64. The water is not treated and is pumped with Holly Gaskill pumps. The daily consumption is 800,000 gallons. The annual cost of pumping is $20,000.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF GALESBURG.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
611	Mar. 23, 1896	.....	.....	.....	485.6	14.5	2.7	.....	.....	.000	.2	.....
1581	Nov. 2, 1896	Distinct	.15	000	789.6	55.0	4.5	.080	.320	.005	.08	.....
1582	..do	..do	.5	000	568.0	19.0	1.9	.720	.072	.000	.064	.....
1584	..do	..do	Red ..	000	769.2	45.0	2.6	.32	.168	.000	.096	.....
2264	Nov. 26, 1896	Slight	.04	000	986.8	73.0	4.0	.062	.19	.000	.4	.....
6499	Dec. 11, 1899	Distinct	.10	000	871.6	62.5	2.1	.064	.102	.01	.56	.....
6500	..do	Slight.	.03	000	1456.8	157.5	1.9	.560	.030	.09	.64	.....
6501	..do	Distinct	.20	000	949.6	74.5	2.1	.4	.096	.02	.4	.....
9195	July 19, 1901	..do	Yel ..	00	855.6	47.0	3.0	.016	.048	.000	.6	.....
10474	June 23, 1902	..do	..do ..	00	693.6	14.0	2.3	.560	.046	.011	.069	.....
11981	April 1904	.....	.....	.....	454.8	25.0	4.1	1.6	.078	.001	.08	.....
11982	..do	.....	.....	.....	963.2	66.5	3.5	.32	.046	.100	.88	.....
12160	June 16, 1904	Slight	.1	000	1153.2	92.25	1.4	.428	.044	.035	.285	.....
12196	.....	Very slight . . .	00	000	791.6	56.5	3.6	.056	.196	.000	.08	.....
12197	.....	..do	000	000	800.0	56.5	3.7	.032	.184	.000	.04	.....
12228	July 12, 1904	Very decided . .	000	000	1405.6	72.75	4.6	.240	.304	.040	.24	.....
12229	..do	..do	000	000	1329.2	70.25	4.5	.240	.304	.032	.208	.....
13664	Oct. 12, 1905	000	000	E'rth	1052.0	77.0	3.2	.480	.082	.017	.28	.....
13730	Nov. 8, 1905	Very slight . . .	000	000	1460.0	121.	4.2	1.056	.036	.046	.20	.....
15172	Oct. 15, 1906	..do	000	0	659.0	49.	7.5	1.120	.400	.000	.120	295.7
14274	May 30, 1906	Distinct	.4	000	921.0	54.5	3.35	.704	.134	.007	.24	340.

An analysis of the mineral content gave the following results:

Ions.	Parts Per Million.		
Laboratory No.	6,500	11,981	11,982
Date	Dec. 11, 1899.	April 24, 1904.	April 24, 1904.
Potassium, K	18.5		
Sodium, Na	344.4	22.6	130.8
Ammonium, NH_4	.7	2.	.5
Magnesium, Mg	38.6	37.3	47.1
Calcium, Ca	83.2	79.8	130.1
Ferrous, Fe	.42		
Aluminium, Al	.4		
Silica, SiO_2	4.9	6.4	5.8
Nitrate, NO_3	2.7	.3	1.7
Chloride, Cl	157.5	25.	66.5
Sulphate, SO_4	644.4	30.4	361.6

Hypothetical Combinations.		Parts Per Million.			Grains Per U. S. Gallon.		
		6,500	11,981	11,982	6,500	11,981	11,982
Potassium nitrate,	KNO_3	4.5			.26		
Potassium chloride,	KCl	32.0			1.86		
Sodium nitrate,	$NaNO_3$		.5	2.3		.03	.13
Sodium chloride,	NaCl	234.3	41.3	109.7	13.67	2.40	6.40
Sodium sulphate,	Na_2SO_4	778.1	19.2	267.2	45.39	1.12	15.58
Ammonium sulphate,	$(NH_4)_2SO_4$	2.6	7.50	1.7	.15	.44	.10
Magnesium sulphate,	$MgSO_4$	171.0	9.40	224.7	9.98	.55	13.10
Magnesium carbonate,	$MgCO_3$	14.5	123.2	6.5	.85	7.18	.38
Calcium carbonate,	$CaCO_3$	207.8	244.5	325.8	12.11	14.25	18.99
Oxide of iron and alumina	$Fe_2O_3 + Al_2O_3$		9.5	6.8		.55	.40
Ferrous carbonate.	$FeCO_3$	.9			.05		
Alumina,	Al_2O_3	.8			.04		
Silica	SiO_2	10.4	13.7	12.3	.60	.80	.71
	Total	1,456.9	468.8	927.0	84.96	27.32	55.79

...Galva, Henry county (2,682), obtains its water supply from deep wells 1,500 feet deep. The system is owned by the city and was established in 1894.

Gardner, Grundy county (1,036), has no general city supply.

Geneseo, Henry county (3,356), is located about a mile from Green river. Source of municipal supply is springs and wells. The plant is owned by the city and was established in 1902 at a cost of $20,000. The pumping station is located two miles north of the city. A Gould triplex pump, with capacity of 25,000 gallons per hour, is used. The water is not treated and the daily consumption is about 160,000 gallons. A new well was put in in 1906. For sanitary analysis of new well see final table.

Mineral analysis of the spring water gave the following results:

LABORATORY NO. 9171. JULY 26, 1901.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	1.7	Potassium nitrate,	KNO_3	.3	.02
Sodium, Na	8.1	Potassium chloride,	KCl	3.2	.19
Ammonium, (NH_4)	.1	Sodium chloride,	NaCl	5.1	.30
Magnesium, Mg	32.7	Sodium sulphate,	Na_2SO_4	18.8	1.09
Calcium, Ca	76.9	Ammonium sulphate,	$(NH_4)_2SO_4$	.4	.02
Ferrous, Fe	.8	Magnesium sulphate,	$MgSO_4$	15.6	.90
Aluminium, Al	3.1	Magnesium carbonate,	$MgCO_3$	103.3	5.99
Silica, Si	23.5	Calcium carbonate,	$CaCO_3$	192.1	11.14
Nitrate, NO_3	.17	Ferrous carbonate,	$FeCO_3$	1.6	.09
Chloride, Cl	4.6	Alumina,	Al_2O_3	5.8	.34
Sulphate, SO_4	38.6	Silica,	SiO_2	50.0	2.90
		Total		396.2	22.98

Geneva, Kane county (2,446), obtains its water supply from artesian wells 2,500 feet deep. The system is owned by the city.

Genoa, DeKalb county (1,140), obtains its water supply from a well 1,500 feet deep. The system is owned by the village and was established at a cost of $2,500. A Downie pump and air pressure tanks are used. The daily consumption is 50,000 gallons.

For sanitary analysis see final table.

Germantown, Vermilion county (1,782), obtains its water supply from the Danville City Water Company. It was annexed to Danville in March, 1907.

Gibson City, Ford county (2,054), obtains its water supply from wells. The plant is owned by the city and was installed at a cost of $30,000. The wells are eighteen feet, twenty-four feet, forty feet and forty-five feet deep.

Gilman, Iroquois county (1,441), has sent no report.

Girard, Macoupin county (1,661), has no general water supply.

Glencoe, Cook county (1,020), obtains its water supply from Lake Michigan. The water is furnished by the city of Winnetka.

For sanitary analysis see Winnetka in final table.

Golconda, Pope county (1,140), is located on the Ohio river. The water supply is obtained from the river. It is used for sprinkling streets. It is owned by Jo Williamson & Co.

Granite City, Madison county (3,122, including Madison and Venice) is located on the Mississippi river. The water supply is obtained from the river. The ownership is private. The water is treated by coagulation and sedimentation. The pumping station and settling basins are located on bank of river. Compound non-condensing and triple expansion condensing pumps are used. The daily consumption is from 2,000,000 to 3,000,000 gallons. Capacity of settling basins about 4,000,000 gallons.

Grayville, White county (1948) is located on Wabash river. The water supply is obtained from the river. The system is owned by the city and was established in 1895.

Greenfield, Greene county (1,085), has no general water supply.

Greenup, Cumberland county (1,085), is located on the Embarrass river. The water supply is obtained from the river. The system is owned by the city and was established in 1897.

Greenview, Menard county (1,019) located on Green Creek, has sent no report.

Greenville, Bond county, (2,504) obtains the city water supply from driven wells from 45 to 50 feet deep, through sand and gravel. Cook strainers are used on 8 inch pipes. The plant is owned by the city and was established in 1883 or 1884 at a cost of $20,000. Two Harris pumps are used. The water is pumped direct from suction pipes into the mains (Hawley system.) The daily consumption is about 150,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 3948, AUGUST 13, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	1.9	Potassium nitrate,	KNO_3	4.9	.28
Sodium, Na	27.8	Sodium nitrate,	$NaNO_3$	.8	.05
Ammonium, (NH_4)		Sodium chloride,	NaCl	39.6	2.30
Magnesium, Mg	40.8	Sodium sulphate,	$CaSO_4$	37.1	2.16
Calcium, Ca	111.0	Magnesium sulphate,	$MgSO_4$	65.1	3.79
Ferrous, Fe	.2	Magnesium carbonate,	$MgCO_3$	96.4	5.62
Aluminium, Al	1.1	Calcium carbonate,	$CaCO_3$	277.3	16.17
Silicon, SiO_2	13.6	Ferrous carbonate,	$FeCO_3$	.5	.03
Nitrate, NO_3	3.6	Alumina,	Al_2O_3	2.0	.11
Chloride, Cl	24.	Silica,	SiO_2	28.8	1.68
Sulphate, SO_4	77.1				
		Total		552.5	32.19

Griggsville, Pike county (1,404) has no general water supply.

Grossdale, Cook county (1,111) has sent no report.

Hamilton, Hancock county (1,344) is located on the Mississippi river. It has no general water system.

Harrisburg, Saline county (2,202), located on Saline river, obtains its water supply from the creek. The system is owned by the city and was established in 1901.

Harvard, McHenry county (2,602) obtains its water supply from an artesian well 1,800 feet deep. The system is owned by the city and was established in 1893.

Harvey, Cook county (5,395) is located on Calumet river. The water supply is obtained from wells 1,600 to 1,800 feet deep. The system is owned by the North Shore Electric Company and was established in 1890.

Havana, Mason county (3,268) is located on the Illinois river. Municipal supply is obtained from ten wells, each 75 feet deep. The system is owned by the city and was established in 1889 at a cost of $40,000. Two Deane

duplex tandem compound pumps with a capacity of 250,000 gallons each are used. The daily consumption is 500,000 gallons. Quality of water is good. For sanitary analyses see final table. An analysis of the mineral contents gave the following results:

Ions.	Parts Per Million.	
	3,752	14,711
Potassium, K	1.2	....
Sodium, Na	4.9	8.9
Magnesium, Mg	14.0	13.0
Calcium, Ca	39.5	37.5
Ferrous, Fe	.3	.6
Aluminium, Al	.3	.7
Silica, SiO_2	13.3	13.2
Nitrate, NO_3	2.4	4.1
Chloride, Cl	2.2	4.0
Sulphate, SO_4	20.9	20.9

Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
		3,752	14,711	3,752	14,711
Potassium nitrate,	KNO_3	3.2		.18	
Sodium nitrate	$NaNO_3$	.6	5.6	.03	.33
Sodium chloride,	NaCl	3.6	6.6	.21	.38
Sodium suphate,	Na_2SO_4	10.3	14.8	.59	.86
Magnesium sulphate,	$MgSO_4$	17.4	13.7	1.01	.80
Magnesium carbonate	$MgCO_3$	36.5	35.3	2.13	2.06
Calcium carbonate,	$CaCO_3$	98.6	93.6	5.74	5.46
Oxide of Iron and Alumina	Al_2O_3		1.2		.07
Ferrous carbonate,	$FeCO_3$	.6		.03	
Alumina,	Al_2O_3	.6	7.7	.03	.45
Silica,	SiO_2	28.4	13.2	1.65	.77
Bases			.4		.03
	Total	199.8	192.1	11.60	11.20

Henry, Marshall county (1,637) is located on the Illinois river. The water supply is obtained from wells, 1,355 feet deep. The system is owned by the city and was established in 1902, at a cost of $29,500. Two pumps are used and the daily consumption is 30,000 gallons. The water is pumped direct to the mains through the system which includes large pressure tanks at the pumping station.

For sanitary analysis see final table.

An analysis of mineral content gave the following results:

LABORATORY NO. 14893, NOV. 6, 1906.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Milliion.	Grains Per U.S.Gallon.
Sodium, Na	907.7	Sodium nitrate,	$NaNO_3$	2.2	.12
Magnesium, Mg	17.4	Sodium chloride,	NaCl	1798.7	104.91
Calcium, Ca	37.7	Sodium sulphate,	Na_2SO_4	266.4	15.53
Ferrous, Fe	2.8	Sodium carbonate,	Na_2CO_3	259.1	15.11
Silica, SiO_2	5.9	Calcium carbonate,	$CaCO_3$	94.1	5.49
Nitrate, NO_3	1.6	Magnesium carbonate,	$MgCO_3$	60.3	3.51
Chloride, Cl	10.9	Ferrous carbonate	$FeCO_3$	5.8	.34
Sulphate, SO_4	180.0	Alumina,	Al_2O_3	5.9	.34
		Silica,	SiO_2	3.3	.19
		Bases,		1.2	.07
		Total		2497.0	145.61

Herrin, Williamson county (1,559) located about four miles from Big Muddy river, has no general water supply.

Highland, Madison county (1,970), obtains its water supply from a reservoir. It is used for sprinkling streets. The system is owned by the Highland Water Company and was established about 1903.

Highland Park, Lake county (2,806) is located on Lake Michigan, from which the city supply is obtained. The pumping stations are located on the Lake Shore. Deane pumps are used. The water is said to have shown slight contamination for last two years.

Hillsboro, Montgomery county (1,937) obtains city supply from group of springs and reservoir. The plant is owned by the city and was installed in 1900 at a cost of about $18,000. Two Worthington pumps are used.

Hinsdale, DuPage county (2,578) obtains its water supply from wells 600 feet deep. The system is owned by the city and was established in 1891.

Homer, Champaign county (1,080) located on Salt Fork Creek, has no general water supply.

Hoopeston, Vermillion county, (3,823, estimated 6,100), obtains its water supply from 3 wells, 110 to 250 feet deep. The system is owned by the city and was established in 1888 at a cost of $80,000. There are two Dean pumps. The daily consumption is 300,000 gallons.

Jacksonville, Morgan county (15,078) has obtained its supply from wells, a creek, and a lake near the city. The system is owned by the city and was established in 1886 at a cost of $400,000. Smith Vaile & Worthington pumps each of 2,000,000 gallons capacity are used. The daily consumption is 1,000,000 gallons. The capacity of the reservoir is 5,000,000 gallons. A new supply is to be obtained from wells 80 feet deep in the Illinois river bottoms west of Bluffs. The water is to be pumped to the reservoir as heretofore.

For sanitary analysis of the old supply and the proposed supply see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF JACKSONVILLE.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.	
								Free.	Albuminoid.			
1514	Oct. 16, 1898	Distinct.....	Mud..	000	879.2	280.0	5.0	.024	.256	Trace	1.15	.....
1515	..do.....	..do.....	Yel..	000	2476.0	990.0	4.1	1.320	.014	.000	.2	.....
1618	Nov. 10, 1898	Slight.....	.04	000	862.0	320.0	4.0	.000	.21	.065	.9	.....
3712	June 21, 1899	Distinct.....	.02	000	2466.0	1000.0	4.6	1.2	.022	.000	.5	.....
5926	Sept. 21, 1899	..do.....	.60	000	370.8	5.	9.7	.014	.440	.000	.4	.....
8993	Feb. 12, 1901	Clear.....	.01	000	406.4	17.0	2.1	.052	.078	.002	1.758	.....
14114	Mar. 13, 1906	..do.....	.00	000	321.0	1.5	1.8	.048	.162	.005	.23	176.4

An analysis of the mineral content of the proposed supply gave the following results:

LABORATORY NO. 14072, APRIL 9, 1906, AND 14113, APRIL 13, 1906.

Ions	Parts Per Million.		Hypothetical Combinations.	Parts Per Million.		Grains Per U.S. Gal.	
	14072	14113		14072	14113	14072	14118
Potassium, K	.8	23.9	Potassium nitrate, KNO_3	2.0	1.3	.12	.04
Sodium, Na	6.5	16.3	Potassium chloride, KCl		3.2		.2
Ammonium, $(NH)_4$	.1		Potassium sulphate, K_2SO_4		47.2		
Magnesium, Mg	27.1	25.1	Sodium Chloride, NaCl	4.1		.24	2.75
Calcium, Ca	84.5	40.8	Sodium sulphate, Na_2SO_4	15.1	50.3	.88	2.93
Ferrous, Fe	.8	.2	Ammonium sulphate, $(NH_4)_2SO_4$	.4		0.2	
Silicon, Si		17.9	Magnesium sulphate, $MgSO_4$	4.8	40.9	.28	2.38
Nitrate, NO_3	1.2	.8	Magnesium carbonate, $MgCO_3$	125.0	58.2	7.29	3.39
Chloride, Cl	2.5	2.0	Calcium carbonate, $CaCO_3$	210.9	101.8	12.30	5.94
Sulphate, SO_4	14.3	92.6	Ferrous carbonate, $FeCO_3$	1.7	.4	.10	.02
			Alumina, Al_2O_3	2.3	1.6	.13	.09
			Silica, SiO_2	17.1	17.9	1.00	1.04
			Total	383.4	323.8	22.36	18.86

Jerseyville, Jersey county (3,517) obtains its water supply from two wells, 2,200 feet deep.

For sanitary analysis see final table.

Analysis of mineral content gave the following results.

LABORATORY NO. 3750. JUNE. 27, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	3750			3750	3750
Potassium, K	34.1	Potassium nitrate,	KNO_3	1.1	0.06
Sodium, Na	719.5	Potassium chloride,	KCl	64.0	3.75
Ammonium (NH_4)	1.4	Sodium chloride	NaCl	1713.1	99.92
Magnesium, Mg	49.4	Sodium sulphate,	Na_2SO_4	140.6	8.19
Calcium, Ca	110.1	Ammonium sulphate,	$(NH_4)_2 SO_4$	5.1	.29
Ferrous, Fe	1.2	Magnesium sulphate	$MgSO_4$	250.5	14.61
Aluminium, Al	9.1	Calcium sulphate,	$CaSO_4$	160.8	9.37
Silicon, Si	4.6	Calcium carbonate,	$CaCO_3$	156.8	9.14
Nitrate, NO_3	.7	Ferrous carbonate,	$FeCO_3$	2.6	.15
Chloride, Cl	1070.0	Alumina,	$Al_2 O_3$	1.8	.10
Sulphate, SO_4	412.6	Silica,	SiO_2	9.8	.57
		Total		2506.2	146.13

Joliet, Will county (29,353) is located on the Desplaines river. The water supply is obtained from a deep well, driven wells and from Hickory creek. For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF JOLIET.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
631	Mar. 26, 1896	.....	.....	.....	480.0	9.0	1.6	.01	.07	.002	4.0	.....
742	April 20, 1896	.....	.....	.....	518.0	8.0	2.5	.014	.104	.016	1.4	.....
1566	Oct. 27, 1896	Slight	.03	.000	490.0	15.0	2.3	.048	.072	.013	.5	.....
1594	Nov. 3, 1896	..do.	.02	.000	494.4	16.0	1.5	.016	.070	.003	.5	.....
2349	Nov. 19, 1896	..do.	.02	.000	440.4	15.0	1.8	.004	.932	.017	1.5	.....
2505	July 29, 1897	..do.	.04	.000	454.0	14.0	3.0	.040	.068	.009	.35	.....
4245	Oct. 24, 1898	Distinct.	.05	.000	492.0	16.0	2.9	.016	.090	.01	.3	.....
7415	April 26, 1900	Slight.	.02	.000	492.8	14.1	2.0	.070	.036	.017	1.52	.....
7416	..do.	..do.	.02	.000	287.2	11.0	2.4	.066	.056	.008	1.80	.....
7418	..do.	..do.	.02	.000	520.8	30.0	1.4	.032	.012	.001	.16	.....
7419	..do.	Distinct.	.06	.000	458.4	10.5	3.5	.084	.126	.015	1.6	.....
7420	..do.	Slight.	.01	.000	490.4	23.5	1.00	.490	.010	.001	.16	.....
10104	Dec. 16, 1901	..do.	.01	.000	525.2	11.0	3.100	.016	.074	.001	.553	.....
12375	Aug. 25, 1904	..do.	.00	.000	666.8	33.25	2.200	.116	.062	.007	2.04	.....
12377	..do.	..do.	.00	.000	478.4	10.5	2.6	.016	.080	.000	.40	.....
12440	Sept. 12, 1904	Distinct.	.10	.000	460.	9.0	2.3	.080	.144	.000	.32	.....
15492	Dec. 26, 1906	Clear.	.0	.0	542.0	19.0	3.4	.040	.080	.005	1.20	261.4

Jonesboro, Union county (1130) obtains its water supply from a well 400 feet deep. The system is owned by the city and was established in 1900.

Kangley, LaSalle county (1,004) obtains its water supply from a well 60 feet deep. The system is owned by the city and was estableshed in 1904.

Kankakee, Kankakee county (13,596) is located on the Kankakee river.

The water supply is obtained from the river. The system is owned by a private company. The water is treated with aluminium sulphate and after sedimentation is filtered through mechanical filters. Iron sulphate and lime will be subtituted for the sulphate of aluminum, early in 1907. There are two compound duplex pumps of 1,500,000 gallons capacity and one Deane compound duplex condensing pump of 3,000,000 capacity. The daily consumption is 1,600,000 gallons.

For sanitary analysis see the following table:

ANALYSES OF WATER FROM KANKAKEE RIVER, KANKAKEE, ILLINOIS—CITY SUPPLY—UNFILTERED. 1906.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
666	April 4, 1896	.....	.....	.....	247.6	2.1	13.0	.....	.....	.013	.75	.....	.....	.....	.....	.....
8630	Oct. 5, 1900	Slight.....	.1	.00	277.6	3.8	6.1	.184	.256	.002	.118	.....	.....	.....	.....	.....
10116	Dec. 19, 1901	..do.....	.2	.00	324.0	3.2	8.8	.132	.176	.016	2.704	.....	.....	.....	.....	.....
10117	..do.....	..do.....	.2	Vinegar	346.4	3.2	9.5	.080	.192	.012	2.388	.....	.....	.....	.....	.....
10317	Mar. 16, 1902	Decided.....	Mud	.00	460.4	1.9	26.7	.096	.496	.030	3.57	.....	.....	.....	.....	.....
10435	June 5, 1902	Distinct....	Mud	.00	307.2	1.9	19.2	.112	.480	.040	1.16	.....	.....	.....	.....	.....
10436	..do.....	Very slight . .	.9	.00	290.4	1.6	19.2	.068	.416	.000	.8	.....	.....	.....	.....	.....
10800	Dec. 11, 1902	Distinct....	.7	.00	314.4	3.2	9.0	.074	.288	.001	.44	.....	.....	.....	.....	.....
14158	April 2, 1906	Decided....	.4	.00	317.	2.0	10.7	.072	.432	.003	1.20	146.4	1720	1 +	2 +	2 –
14268	April 30, 1906	V.decided..	.5	.....	343.	2.0	14.1	.072	.432	.004	.600	180.	590	1 +	2 –	2 +
14450	May 28, 1906	Decided....	.6	.00	394.	3.0	9.95	.136	.344	.020	.66	167.4	1100	1 +	2 +	2 –
14532	June 19, 1906	..do.....	.3	Earthy...	330.	2.5	9.6	.056	.640	.005	.475	192.	280	1 –	2 +	1?
																1 –
14782	Aug. 13, 1906	..do.....	.4	..do.....	349.	.5	10.35	.104	.304	.006	.52	168.7	400	1 +	2 +	2 –
15103	Oct. 4, 1906	..do.....	.4	.00	326.	3.0	9.75	.080	.270	.000	.48	155.5	6200	1 –	1 +	1 +
															1 ?	1?
15271	Oct. 30, 1906	..do.....	.2	.00	291.	2.0	5.7	.040	.240	.001	.32	201.6	300	1 –	2 +	1 +
																1 –
153777	Nov. 20, 1906	Distinct....	.4	.00	306.	3.	5.8	.016	.152	.003	.36	195.8	1400	1 +	2 +	1 –
																1 +
15455	Dec. 15, 1906	Decided....	.4	.00	299.	3.0	12.6	.072	.296	.004	1.56	150.5	4250	1 +	2 +	2 +

ANALYSIS OF WATER FROM KANKAKEE RIVER—FILTERED—CITY SUPPLY, KANKAKEE, ILLINOIS. 1906.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
667	April 4, 1898	.....	.....	.....	246.0	1.90	12.9	.....	.....	.008	.70	.....	.....	.....	.....	.....
3946	Aug. 11, 1898	Distinct.....	.06	.00	248.0	3.4	6.2	.038	.30	.001	.25	.....	.....	.....	.....	.....
3947	..do.....	..do.....	.06	.00	170.0	3.3	5.2	.082	.28	.013	.25	.....	.....	.....	.....	.....
9759	Nov. 14, 1901	..do.....	.2	.00	278.4	3.8	6.1	.036	.144	.000	.600	.....	.....	.....	.....	.....
9763	Dec. 14, 1901	..do.....	.15	.00	270.	3.8	6.4	.02	.224	.002	.478	.....	.....	.....	.....	.....
10656	Oct. 1, 1902	Slight.....	.4	.00	252.8	2.3	8.8	.04	.128	.000	.400	.....	.....	.....	.....	.....
10798	Dec. 11, 1902	Very slight.	.3	.00	304.8	3.6	8.6	.056	.240	.000	.440	.....	.....	.....	.....	.....
10799	..do.....	Clear.....	.4	.00	309.2	3.2	7.9	.074	.232	.000	.400	.....	.....	.....	.....	.....
11030	May 4, 1903	Very slight.	.8	.00	226.4	1.6	14.9	.084	.400	.000	.240	.....	.....	.....	.....	.....
11031	..do.....	..do.....	.8	.00	230.4	1.6	13.8	.084	.384	.000	.160	.....	.....	.....	.....	.....
11843	Mar. 3, 1904	Distinct.....	.....	Musty.....	133.6	1.6	9.0	.468	.240	.001	.56	.....	.....	.....	.....	.....
14016	Feb. 19, 1906	Clear.....	.2	.00	338.	3.0	6.6	.080	.184	.000	.240	178.0	.....	.....	.....	.....
14017	..do.....	..do.....	.2	.00	362.	3.0	6.65	.056	.176	.000	.360	181.4	138	1—	2—	2—
14159	April 2, 1906	Very slight.	.00	.00	260.	2.0	4.3	.072	.208	.000	1.08	117.8	171	1 + 1—	2—	1 + 1—
14266	April 30, 1906	Clear.....	.4	.....	328.	2.0	11.5	.048	.336	.000	.64	184.0	69	1—	2—	2—
14451	May 28, 1906	Distinct....	.4	.00	299.	3.	6.5	.184	.064	.000	.66	167.4	135	1 +	1 + 1 —	1 + 1—
14533	June 19, 1906	Clear.....	.1	.00	314.	4.0	6.5	.040	.184	.000	.68	165.	140	1—		2—2—
14783	Aug. 13, 1906	Slight.....	.2	Earthy	314.	1.5	6.05	.024	.160	.000	.60	172.6	300	1 +		2+2—
15104	Oct. 4, 1906	..do.....	.4	.00	273.	3.0	4.7	.020	.126	.006	.48	144.0	80	1?	1?	1 + 1?
15272	Oct. 30, 1906	Very slight.	.0	.00	291.	3.0	4.4	.032	.160	.000	.16	188.2	82	1 +	1 + 2—	2—
15378	Nov. 20, 1906	Slight.....	.1	2Earthy	307.	3.	3.8	.008	.128	.003	.40	182.4	370	1 +	1 + 1—	2—
15456	Dec. 15, 1906	Clear.....	.2	.00	303.	4.0	5.15	.040	.136	.000	1.56	71.3	95	1—	2—	2—

An analysis of the mineral content gave the following results:

Laboratory Number	3946	Aug. 11, 1898	Laboratory Number	14158	April 26, 1906
..do.....	3947	..do.....	.. do	14159	..do.....
..do.....	5373	Aug. 14, 1899	.. do	14265	June 9, 1906
..do.....	14016	Mar. 23, 1906	.. do	14266	..do.....
..do.....	14017	..do.....			

Amounts stated in Parts per Million.

Ions.	3946	3947	5373	14016	14017	14158	14159	14265	14266
Potassium, K	.....	.....	.....	.....	.....	2.0	2.7	2.0	1.6
Sodium, Na	9.1	9.9	11.9	9.7	8.9	5.3	5.5	6.9	10.0
Ammonium, (NH_4)	.....	.....	.....	.1	.1	.1	.09	0.1	0.1
Magnesium, Mg	13.6	7.7	13.5	22.3	20.6	17.6	18.9	21.4	20.6
Calcium, Ca	46.5	48.09	40.0	72.9	66.9	56.7	54.3	73.2	75.1
Ferrous, Fe	.....	.....	.....	.7	.6	4.2	.14	1.9	0.7
Aluminium, Al	.....	.....	.....	1.0	1.5	10.8	1.4	2.7	0.4
Silicon, Si	4.9	3.1	14.4	6.5	4.5	37.2	4.5	8.1	.....
Nitrate, NO_3	1.1	1.1	3.9	1.1	1.6	5.3	4.8	2.8	2.8
Chloride, Cl	3.4	3.3	2.2	3.0	3.0	2.0	2.0	2.0	2.0
Sulphate, SO_4	37.6	34.6	39.7	75.6	74.0	50.0	86.8	46.0	50.0
Bases,	.....	.....	.....	.....	.....	16.5	.....	.....	1.4

Amounts stated in Parts per Million.

Hypothetical Combinations.		3946	3947	5373	14016	14017	14158	14159	14265	14266
Potassium nitrate,	KNO_3	.....	.....	.....	.....	.....	5.2	7.0	4.6	4.1
Potassium chloride,	KCl	.....	.....	.....	.....	.....	.....	.....	.4	.....
Sodium nitrate,	$NaNO_3$	1.5	1.5	5.3	1.5	2.2	2.9	.7	.....	.4
Sodium chloride,	NaCl	5.6	5.4	3.6	5.0	3.0	3.3	3.3	3.0	3.3
Sodium sulphate,	Na_2SO_4	20.1	13.5	14.4	22.5	19.4	9.9	12.3	17.6	26.5
Ammonium sulphate,	$(NH_4)_2SO_4$	.....	.....	.....	.4	.4	.4	.4	.4	.4
Magnesium sulphate,	$MgSO_4$	30.1	31.9	37.6	75.3	75.9	53.9	93.4	42.4	39.9
Magnesium carbonate,	$MgCO_3$	51.4	35.9	20.6	24.6	18.4	23.2	5.2	44.3	43.3
Calcium carbonate,	$CaCO_3$	125.4	71.6	100.0	180.0	167.0	141.5	131.8	182.7	187.5
Oxide of iron and alumina,	Fe_2O_3+ Al_2O_3	1.7	2.6	4.7	.....	.....	.....	.....	.....	.....
Ferrous carbonate,	$FeCO_3$	.....	.....	.....	1.5	1.2	8.7	.3	3.9	1.5
Alumina,	Al_2O_3	.....	.....	.....	1.0	1.5	10.8	1.4	2.7	.4
Silica,	SiO_2	10.5	6.6	30.6	6.5	4.5	37.2	4.5	8.1	4.8
Bases,		.....	.....	.....	.....	.....	16.5	.....	5.3	1.4
Total		246.3	169.0	216.8	318.3	295.5	313.5	260.3	315.4	313.5

Amounts stated in Grains per U. S. gallon.

Hypothetical Combinations.		3946	3947	5373	14016	14017	14158	14159	14265	14266
Potassium nitrate,	KNO_3	.....	.....	.....	.....	.....	.30	.40	.27	.24
Potassium chloride,	KCl	.....	.....	.....	.....	.....	.....	.....	.02	.....
Sodium nitrate,	$NaNO_3$	.08	.08	.31	.09	.13	.17	.04	.....	.02
Sodium chloride,	NaCl	.33	0.31	.21	.29	.29	.19	.19	.17	.19
Sodium sulphate,	Na_2SO_4	1.17	.78	.84	1.31	1.13	.58	.72	1.03	1.55
Ammonium sulphate,	$(NH_4)_2SO_4$	.....	.....	.....	.02	.02	.02	.02	.02	.02
Magnesium sulphate,	$MgSO_4$	1.75	1.86	2.19	4.39	4.43	3.14	5.44	2.47	2.33
Magnesium carbonate,	$MgCO_3$	2.99	2.09	1.19	1.43	1.07	1.35	.30	2.59	2.52
Calcium carbonate,	$CaCO_3$	7.30	4.17	5.83	10.5	9.74	8.25	7.69	10.66	10.94
Oxide of iron and alumina,	Fe_2O_3+ Al_2O_3	.09	.15	.27	.....	.....	.....	.....	.....	.....
Ferrous carbonate,	$FeCO_3$	.....	.....	.....	.09	.07	.51	.02	.23	.09
Alumina,	Al_2O_3	.....	.....	.....	.06	.09	.63	.08	.16	.02
Silica,	SiO_2	.61	.38	1.78	.38	.26	2.17	.26	.47	.28
Bases,		.....	.....	.....	.....	.....	.96	.....	.....	.08
Total		14.32	9.82	12.62	18.56	17.24	18.27	15.16	18.40	18.28

ANALYSES OF WATER FROM THE KANKAKEE RIVER AT KANKAKEE, ILLINOIS, AUGUST 1st TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica, SiO_2	Iron Fe.	Aluminium, Al	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium, Na.	Bi-Carbonate HCO_3	Sulphate, SO_4	Chlorine, Cl.	Nitrate, NO_3
2201	Aug.	4-10	30	13.	329	22	.2	....	59	21	18.	234	69	4.7	4.
2202	..do.	11-18	40	7.6	273	16	.1	....	56	20	8.5	213	53	5.5	3.
2203	..do.	21-30	70	28.	326	21	.07	....	55	21	17.	207	57	3.5	3.5
2204	..do.	31- 9	50	26.	283	17	.14	....	57	24	14.	201	52	4.5	2.
2205	Sept.	10-19	10	16.	289	14	.12	....	55	27	12.	226	56	5.	.6
2206	..do.	20-29	30	13.	286	12	.15	....	58	18	16.	226	38	5.5	1.8
2207	Oct.	1- 8	60	40.	285	16	.06	....	58	22	16.	225	53	5.0	2.0
2208	..do.	11-19	14	14.	300	11	.04	....	61	.....	12.	250	60	6.0	1.7
2209	..do.	21-29	30	19.	302	15	.06	....	63	27	17.	262	63	8.	1.
2210	..do.	30- 8	10	4.5	306	17	.03	....	64	24	13.	263	62	4.8	.6
2211	Nov.	9-19	30	18.	295	11	.04	....	55	16	10.	219	74	6.5	4.0
2212	..do.	20-30	20	19.	314	16	.05	....	61	23	22.	203	83	6.	8.
2213	Dec.	1-10	....	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....
2214	..do.	11-14	10	19.	312	17	.34	....	55	31	25.	180	90	10.	8.
2215	No	Sample	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Average			31	25.	300	16	.17	....	58	23	15.	224	62	5.8	3.1

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	4.3	.28
Sodium chloride,	NaCl	9.6	.56
Sodium sulphate,	Na_2SO_4	30.8	1.80
Magnesium sulphate,	$MgSO_4$	51.6	3.00
Magnesium carbonate,	$MgCO_3$	43.6	5.54
Calcium carbonate,	$CaCO_3$	144.7	8.45
Iron carbonate,	$FeCO_3$	.4	.02
Silica,	SiO_2	16.0	.93
Total		301.1	17.55

Kansas, Edgar county (1,049) has no general water supply.

Keithsburg, Mercer county (1,566) is located on the Mississippi river. The municipal supply is obtained from shallow wells. The system is owned by the city and was established in 1893 at a cost of $15,000. The system includes a stand tower. The water is not used by citizens on account of excessive hardness. The pumps are Deane compound.

Kewanee, Henry county (8,382) obtains its water supply from artesian wells 1,485 feet deep. The system is owned by the city. The pumps are Buffalo compound. The daily consumption is about 300,000 gallons. New wells and a new pumping station are contemplated.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF KEWANEE.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.	Alkalinity
		Turbidity.	Color.	Odor.				Free.	Albuminoid.			
1782....	Dec. 29, 1896	..do.....	.02	.000	1144.0	190.0	1.9	.136	.008	.4	14.	.....
1783....	..do.....	..do.....	.03	.000	1151.6	190.0	3.7	.124	.008	.95	.32	.....
1785....	..do.....	Distinct..	.03	.000	1149.6	189.0	3.6	.218	.062	1.15	.90	.....
1795....	Jan. 4, 1897	..do.....	Yel..	.....	1143.6	190.0	2.8	1.120	.022	.000	.15	.....
10521....	July 28, 1902	Clear.....	Clear	.000	1175.6	188.0	5.5	1.44	.040	.008	.072	.....
10897....	Feb. 19, 1903	Decided...	.20	.000	1294.4	395.0	6.00	1.2	.032	.016	.384	.....
10898....	..do.....	Distinct..	.1	.000	1226.0	310.0	5.7	.736	.112	.006	.314	.....
10923....	Mar. 7, 1903	Decided...	.1	.000	1043.2	144.0	4.7	.136	.070	.021	1.779	.....
11378....	Sept. 17, 1903	Slight....	.00	.000	1277.6	410.0	5.9	12.80	.014	.004	.10	.....
11379....	..do.....	Decided...	Yel..	.000	1397.6	480.0	7.1	15.2	.044	.000	.080	.....
11459....	Nov. 10, 1903	Ve'y slight	.00	Mus.	1273.6	410.0	6.6	.328	.130	.004	.156	.....
11842....	Mar. 3, 1904	Distinct...	Yel..	.000	1283.6	415.0	6.7	.880	.010	.400	.160	.....
11916....	Mar. 28, 1904	Decided...	..do..	.000	1385.2	452.2	6.9	1.40	.016	.001	.080	.....
12416....	Sept. 7, 1904	.....	.....	.....	1162.4	335.0	5.5	1.00	.102	.160	.32	.....
12417....	..do.....	.....	.....	.....	765.6	47.5	2.5	1.00	.070	.010	.070	.....
12418....	..do.....	.....	.....	.....	1362.0	457.5	3.0	1.40	.036	.000	.12	.....
12459....	Sept. 16, 1904	Decided...	Yel.	Mus.	970.4	149.0	2.4	.176	.100	.007	.20	.....
12497....	Sept. 27, 1904	Clear.....	.000	.000	900.4	120.0	6.2	.084	.056	.036	.244	.....
14430....	June 21, 1906	Slight....	.000	.000	1289.0	410.0	5.15	.938	.056	.026	.13	223.

An analysis of mineral content gave the following results:

Ions.	Amounts Stated in Parts per Million.		
Laboratory No.	3,390	12,418	14,430
Date	March 24, 1898.	Sept. 7, 1904.	July 10, 1906.
Potassium, K	18.9		8.7
Sodium, Na	365.9	2.3	317.8
Ammonium (NH_4)	1.9	1.7	1.2
Magnesium, Mg	25.3	27.3	27.0
Calcium, Ca	65.1	79.1	73.3
Ferrous, Fe	1.2		1.5
Aluminium, Al		6.1	1.7
Silicon, Si	3.9		13.0
Nitrate, NO_3	.3	.6	.6
Chloride, Cl	400.	457.5	386.0
Sulphate, SO_4	256.9	256.4	244.4

Hypothetical Combinations.		Parts Per Million.			Grains Per Gallon.		
		3390	12418	14430	3390	12418	14430
Potassium nitrate,	KNO_3	5.4	.....	1.0	.31	.....	.06
Potassium chloride,	KCl	23.3	.....	15.8	1.88	.....	.92
Sodium nitrate,	$NaNO_3$	.....	.8	.....	.....	.05	.....
Sodium chloride,	NaCl	633.9	754.9	624.6	36.97	44.04	36.43
Sodium sulphate,	Na_2SO_4	360.9	169.9	221.1	21.05	9.91	12.90
Ammonium sulphate,	$(NH_4)_2SO_4$	6.9	6.2	4.4	.40	.36	.26
Magnesium sulphate	$MgSO_4$	11.7	135.9	115.1	.68	7.93	6.11
Magnesium carbonate,	$MgCO_3$	.....	.....	12.8	.....	.....	.75
Calcium sulphate,	$CaSO_4$	79.8	40.1	.....	4.64	2.34	.....
Calcium carbonate,	$CaCO_3$	162.7	168.0	183.0	9.48	9.80	10.67
Oxide of Iron and Aluminium	Fe_2O_3+ Al_2O_3	.....	4.4	.....	.....	.26	.....
Ferrous carbonate,	$FeCO_3$	2.5	.....	3.1	.14	.....	.18
Alumina,	Al_2O_3	.....	.....	1.7	.....	.....	.10
Silica,	SiO_2	8.4	13.0	13.0	.49	.76	.76
Bases,		.....	.....	.8	.....	.....	.05
		1,304.5	1,293.2	1196.4	76.04	75.45	69.19

Kinmundy, Marion county (1,221) has sent no report.

Kirkwood, Warren county (1,008) obtains its water from a well 110 feet deep. The system is owned by the city and was established about 1897.

Knoxville, Knox county (1.857) obtains its water supply from a well 1,350 feet deep four blocks from business center. The system is owned by the city, and was established in 1894 at a cost of $16,000. The water is raised by air lift pumps, with capacity of 140 gallons per minute.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 1701, DEC. 5, 1896.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S.Gallon
Potassium, K	18.6	Potassium nitrate,	KNO_3	.7	.04
Sodium, Na	414.0	Potassium chloride,	KCl	34.9	2.03
Ammonium, NH_4	1.33	Sodium chloride,	NaCl	287.7	16.79
Magnesium, Mg	25.8	Sodium sulphate,	Na_2SO_4	550.7	32.06
Calcium, Ca	57.6	Ammonium carbonate,	$(NH_4)_2CO_3$	7.1	.41
Ferrous, Fe	5.0	Magnesium sulphate,	$MgSO_4$	27.9	1.62
Aluminium, Al	3.2	Magnesium carbonate,	$MgCO_3$	71.3	4.16
Silicon, Si	26.3	Calcium carbonate,	$CaCO_3$	143.8	8.40
Nitrate, NO_3	.4	Ferrous carbonate,	$FeCO_3$	12.1	.71
Chloride, Cl	191.	Alumina,	Al_2O_3	6.	.35
Sulphate, SO_4	394.5	Silica,	SiO_2	55.9	3.26
		Total		1198.1	69.83

Lacon, Marshall county (1,601) is located on the Illinois river. The municipal water supply is obtained from one driven well 50 feet deep. The system is owned by the city, having been installed in 1893. The daily consumption is 120,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S.Gallon
	14,148			14,148	14,148
Potassium, K	1.9	Potassium nitrate,	KNO_3	4.9	.29
Sodium, Na	12.7	Sodium nitrate,	$NaNO_3$	22.4	1.31
Magnesium, Mg	39.2	Sodium chloride,	NaCl	16.8	.98
Calcium, Ca	87.3	Magnesium chloride	$MgCl_2$	6.4	.37
Ferrous, Fe	.5	Magnesium sulphate	$MgSO_4$	47.1	2.75
Aluminium, Al_2O_3	9.3	Magnesium carbonate,	$MgCO_3$	97.0	5.66
Silica, SiO_2	22.0	Calcium carbonate,	$CaCO_3$	217.9	12.71
Nitrate, NO_3	19.0	Ferrous carbonate,	$FeCO_3$	1.0	.06
Chloride, Cl	15.0	Alumina,	Al_2O_3	9.3	.54
Suphate, SO_4	37.6	Silica,	SiO_2	22.0	1.28
		Bases		1.7	.10
			Total	446.5	26.05

Ladd, Bureau county (1,324) obtains its water supply from the shaft of the Illinois Third Vein Coal Company, depth of 180 feet. The coal company furnishes the water.

LaGrange, Cook county (3,969) obtains its water supply from artesian wells. The system is owned by the LaGrange Service Company.

LaHarpe, Hancock county (1,591), obtains its water supply from wells 43 and 63 feet deep about 500 feet from the business center of city. The system is owned by the city and was installed in 1894 at a cost of $15,000. The pumps used are of the Gould duplex type with a capacity of 250 gallons each per minute. The system includes a stand tower. The daily consumption is 50,000 gallons.

Lake Forest, Lake county (2,215) is located on Lake Michigan. The water supply is obtained from the lake, which is said to be polluted by sewage and manufacturing wastes. The system was established in 1892 at a cost of $100,000, and is owned by the Lake Forest Water Supply Company. The water is filtered before it reaches the consumer.

For sanitary analysis see the following table:

RESULTS OF ANALYSES OF WATER TAKEN FROM LAKE MICHIGAN AT LAKE FOREST, ILL.—UNFILTERED.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0. 1 c. c.
1094	July 8, 1896	.....	.....	.....	257.2	32.0	3.9	.096	.106	.000	.100	.....	.....	.....	.....	.....
11121	May 29, 1903	Slight.....	00	000	148.0	2.6	2.3	.012	.06	.001	.160	.....	.....	.....	.....	.....
11491	Oct. 18, 1903	Decided....	.1	Sour.....	148.0	3.0	3.6	.014	.146	.001	.080	.....	.....	.....	.....	.....
11607	Nov. 16, 1903	Distinct....	Muddy	00	162.4	3.0	3.7	.014	.124	.000	.120	.....	.....	.....	.....	.....
11685	Dec. 14, 1903	..do.....	Muddy	00	166.8	3.7	4.4	.024	.156	.001	.200	.....	.....	.....	.....	.....
11759	Jan. 18, 1904	..do.....	00	00	151.2	3.6	4.0	.032	.106	.000	.200	.....	.....	.....	.....	.....
11825	Feb. 22, 1904	Slight.....	00	00	193.5	3.8	4.3	.046	.112	.000	.040	.....	.....	.....	.....	.....
11889	Mar. 22, 1904	Distinct....	.2	Peculiar..	144.0	3.0	3.2	.026	.088	.000	.080	.....	.....	.....	.....	.....
12457	Sept. 16, 1904	Slight.....	.0	00	155.6	3.3	2.6	.042	.128	.000	.160	.....	.....	.....	.....	.....
12567	Oct. 20, 1904	..do.....	000	Moldy....	150.0	3.4	2.8	.034	.104	.000	.160	.....	.....	.....	.....	.....
12765	Dec. 17, 1904	Decided....	Whit'h	0	220.0	3.15	2.2	.044	.120	.000	.360	.....	.....	.....	.....	.....
12856	Jan. 19, 1905	Very slight.	00	00	145.2	3.15	2.5	.056	.116	.000	.120	.....	.....	.....	.....	.....
12956	Mar. 6, 1905	.....	.....	.....	211.6	3.4	4.4	.056	.134	.002	.320	.....	.....	.....	.....	.....
13070	April 10, 1905	.....	.....	.....	149.6	3.4	3.45	.038	.122	.000	.160	.....	.....	.....	.....	.....
13384	July 26, 1905	.....	.....	.....	148.0	3.1	3.05	.036	.092	.000	.160	.....	.....	.....	.....	.....
13607	Sept. 29, 1905	.....	.....	.....	155.	2.1	3.2	.032	.106	.000	.120	.....	.....	.....	.....	.....
13789	Dec. 4, 1905	Decided....	.1	2Vegetable	192.	3.0	2.25	.026	.170	.002	.200	111.8	.....	.....	.....	.....
13876	Jan. 2, 1906	..do.....	1	00	162.	3.5	2.95	.074	.102	.000	.440	103.8	.....	.....	.....	.....
13985	Feb. 7, 1906	..do.....	1.5	00	189.	4.5	3.25	.088	.164	.002	.280	143.6	320	1-	2-	2-
14076	Mar. 5, 1906	..do.....	.4	00	318.	3.5	6.	.098	.162	.002	.240	132.4	6,500	1-	2-	2+
14170	April 2, 1906	Very deci'd.	.2	3 Distinct	211.	3.6	4.25	.064	.144	.001	.200	112.2	1,050	1-	2+	2-
14320	May 7, 1906	Slight.....	00	00	161.	3.0	3.05	.018	.164	.000	.400	118.	13,400	1+	1+	2-
															1?	
14479	June 4, 1906	..do.....	00	3 Earthy...	174.0	3.5	4.2	.050	.168	.000	.280	116.4	1,240	1-	2-	2-
14576	July 3, 1906	..do.....	00	00	142.	5.	3.3	.016	.192	.001	1.20	114.4	60,000	1+	2-	1+1-
14841	Aug. 22, 1906	Clear.....	00	00	159.	2.50	3.3	.044	.118	.000	.040	118.3	320	1+	2-	2+
15155	Oct. 15, 1906	Very deci'd.	.2	00	225.	3.5	5.4	.054	.136	.002	.280	113.3	1,500	1?	2+	1+
																1-
15311	Nov. 6, 1906	Decided.....	00	00	142.	4.2	2.85	.026	.104	.002	.120	111.4	7,600	1-	2-	2-
15415	Dec. 3, 1906	Slight.....	00	00	175.	4.0	3.2	.260	.112	.000	.360	117.1	15,000	1+	1+	1+
															1-	1-

SANITARY ANALYSIS OF WATER TAKEN FROM LAKE MICHIGAN—FILTERED—AT LAKE FOREST, ILL., WATER WORKS.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
4281	Oct. 28, 1908	Distinct	Muddy	.00	176.0	3.1	2.3	.006	.078	.000	.25	.....	.....	.....	.....	.....
11490	Oct. 18, 1903	V. Slight . . .	.00	.00	142.0	3.8	3.2	.008	.080	.000	.080	.....	.....	.....	.....	.....
11608	Nov. 16, 1903	Slight	.00	.00	132.8	3.1	2.9	.010	.080	.000	.120	.....	.....	.....	.....	.....
11686	Dec. 14, 1903	. . do	.00	.00	148.4	3.6	3.0	.020	.128	.001	.080	.....	.....	.....	.....	.....
11760	Jan. 18, 1904	. . do	.00	.00	147.2	3.6	3.6	.028	.100	.000	.200	.....	.....	.....	.....	.....
11826	Feb. 22, 1904	V. Slight . . .	.00	.00	194.5	3.8	3.6	.060	.102	.....	.....	.....	.....	.....	.....	.....
11890	Mar. 21, 1904	. . do	.1	.00	141.2	3.0	3.0	.028	.082	.000	.160	.....	.....	.....	.....	.....
12458	Sept. 16, 1904	. . do	.00	.00	146.0	3.3	1.8	.036	.110	.000	.120	.....	.....	.....	.....	.....
12568	Oct. 20, 1904	Clear	.00	.00	140.8	3.3	2.0	.050	.082	.000	.160	.....	.....	.....	.....	.....
12766	Dec. 17, 1904	Decided	White .	.0	174.0	3.2	2.4	.060	.102	.000	.200	.....	.....	.....	.....	.....
12857	Jan. 19, 1905	None	None . .	Oily	140.4	3.2	2.15	.040	.082	.000	.120	.....	.....	.....	.....	.....
12957	Mar. 6, 1905	.....	.....	.....	145.6	3.45	2.65	.052	.078	.001	.240	.....	.....	.....	.....	.....
13069	April 10, 1905	.....	.....	.....	143.2	3.4	2.85	.042	.114	.000	.200	.....	.....	.....	.....	.....
13383	July 26, 1905	.....	.....	.....	144.	3.1	2.5	.032	.082	.000	.160	.....	.....	.....	.....	.....
13608	Sept. 29, 1905	.....	.....	.....	151.	2.25	2.75	.024	.088	.000	.120	.....	.....	.....	.....	.....
13803	Dec. 4, 1905	Distinct	.1	.00	164.	3.0	3.9	.024	.116	.000	.20	119.6	.....	.....	.....	.....
13877	Jan. 2, 1906	Clear	.0	.00	150.	3.5	2.65	.048	.086	.000	.160	112.2	.....	.....	.....	.....
13986	Feb. 7, 1906	Decided	1.5	.00	179.	4.5	2.9	.088	.150	.001	.280	138.6	80	1–	2–	2–
14077	Mar. 5, 1906	. . do	.3	.00	170.	3.5	3.5	.070	.112	.002	.280	133.6	1800	1–	1–1+	2–
14171	April 2, 1906	. . do	.2	.00	166.	3.15	3.2	.034	.116	.001	.024	110.2	185	1+	2+	2–
14321	May 7, 1906	Slight	.00	.00	156.	3.0	2.4	.074	.162	.000	.20	110.	545	1–	1–1?	2–
14480	June 4, 1906	V. Slight . . .	.00	2Earthy	170.0	4.0	3.3	.046	.124	.000	.280	116.4	560	1?	2–	2–
14575	July 3, 1906	Clear	.000	.00	125.0	4.5	2.6	.016	.120	Trace	.280	98.9	740	1+	2–	2–
14842	Aug. 22, 1906	. . do	.000	.00	145.	3.50	4.0	.010	.088	.000	.160	122.2	120	1–	2–	2–
15156	Oct. 15, 1906	V. Slight	.000	.00	137.	3.0	2.8	.020	.098	.000	.280	115.2	500	1?	2+	1?
																1–
15312	Nov. 6, 1906	Slight	.00	.00	133.	3.0	2.15	.024	.092	.000	.240	109.4	1040	1–	2–	2–
15414	Dec. 3, 1906	. . do	.00	.00	141.	3.0	2.4	.010	.082	.000	.280	115.2	720	1–	2–	2–

Lanark, Carroll county (1,306) obtains its city supply from one well 600 feet deep. The system is owned by the city and was established in 1888 at a cost of about $15,000. The water is pumped by one deep well and one duplex pump. The daily consumption is about 25,000 gallons. The plant is located about two blocks from the business center, and includes a reservoir and stand tower.

LaSalle, LaSalle county (10,446 estimated 15,000) is located on the Illinois river. The city water supply is now obtained from one well 41 feet deep in the Illinois river bottoms. The system is owned by the city and was installed in 1904 at a cost of $32,000. The pumps used are one Worthington and one Holly with capacity of 3,000,000 gallons. The daily consumption is 150,000 gallons. The present supply is said to be deteriorating on account of pollution.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF LA SALLE.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
172....	Nov. 7, 1905	.....	.....	.....	444.8	.....	.....	.....	.....	.....	.....	.....
253....	Nov. 10, 1895	.....	.....	.....	753.							
344....	Dec. 30, 1895	.....	.....	.....	558.0	93.0	1.4	.....	.0	.030	3.40	.....
404....	Jan. 20, 1896	.....	.....	.....	593.2	104.	1.3	.....	.....	.018	2.6	.....
536....	Mar. 2, 1896	.....	.....	.....	541.2	94.0	1.4	.000	.000	.012	2.0	.....
926....	June 1, 1896	Slight.....	.2	.000	446.8	63.0	2.7	.008	.080	.004	1.25	.....
927....	June 1, 1896	..do.....	.01	.000	940.8	25.0	.85	.014	.11	.000	3.0	.....
2819....	Oct. 19, 1897	Clear.....	.02	.000	417.2	65.0	2.7	.02	.052	.000	1.0	.....
7691....	Mar. 7, 1900	Slight.....	.02	.000	391.2	43.0	2.4	.04	.068	.002	.4	.....
9353....	Sept. 5, 1901	..do.....	.02	.000	392.0	43.0	4.2	.064	.108	.002	.318	.....
10279....	Feb. 18, 1902	..do.....	.01	M'sty	430.4	45.0	3.8	.042	.076	.016	.784	.....
10615....	Sept. 16, 1902	Ve'y slight	.0	.000	354.0	22.	1.7	.03	.048	.001	2.0	.....
10616....	Sept. 15, 1902	Distinct...	.1	.000	399.6	26.5	4.3	.046	.112	.003	.637	.....
10618....	Sept. 15, 1902	Ve'y slight	.0	.000	796.0	240.0	3.5	.800	.046	.000	.16	.....
10663....	Oct. 1, 1903	Decided...	Mud..	.000	378.8	21.75	9.4	.012	.152	.020	1.26	.....
10889....	Feb. 10, 1903	Distinct...	..do..	M'sty	347.6	28.0	4.6	.320	.16	.01	1.63	.....
10890....	Feb. 10, 1903	Ve'y slight	.000	.000	448.4	64.0	1.7	.200	.09	.00	1.72	.....
14099....	Mar. 12, 1906	Clear.....	.000	.000	502.	17.5	2.3	.048	.176	.001	1.12	325.0

An analysis of the mineral content gave the following results:

Ions.	Amounts stated in parts per Million.		
Laboratory No.	10, 279	10, 663	14, 099
Date	Feb. 18, 1902.	Oct. 1, 1902.	Mar. 16, 1906.
Potassium, K	5.4	....	2.0
Sodium, Na	28.9	12.2	16.2
Magnesium, Mg	41.1	14.1	43.6
Calcium, Ca	75.3		112.5
Ferrous, Fe	.9		.3
Aluminium, Al	.4		1.8
Silica, Si	2.8	3.4	9.3
Nitrate, NO_3	3.6	5.6	4.9
Chloride, Cl	45.0	22.0	17.5
Sulphate, SO_4	49.9	39.0	113.6

Hypothetical Combinations.		Parts per Million			Grains per U. S Gallon.		
	Laboratory No.	10, 279	10, 663	14, 099	10, 279	10, 663	14, 099
Potassium nitrate,	KNO_3	5.8		5.2	.34		.30
Potassium chloride,	KCl	5.8			.34		
Sodium nitrate,	$NaNO_3$		7.7	2.3		.45	.13
Sodium chloride,	NaCl	69.8	25.9	28.9	4.07	1.51	1.69
Sodium sulphate,	Na_2SO_4	4.8		13.0	.28		.76
Magnesium chloride,	$MgCl_2$		8.5			.50	
Magnesium sulphate,	$MgSO_4$	58.4	48.8	131.4	3.40	2.85	7.66
Magnesium carbonate,	$MgCO_3$	102.1	7.4	58.9	5.95	.43	3.43
Calcium carbonate,	$CaCO_3$	188.2	177.7	280.8	10.98	10.37	16.38
Oxide of iron, Aluminium,	Fe_2O_3 + Al_2O_3		38.4			2.24	
Ferrous carbonate,	$FeCO_3$	1.9		.6	.11		.03
Alumina,	Al_2O_3	.8		1.8	.05		.10
Silica,	SiO_2	5.9	7.2	9.3	.34	.42	.54
	Total	443.5	321.6	532.2	25.86	18.77	31.02

Lawrenceville, Lawrence county (1,300) is situated on the Embarras river. The city supply is obtained from three wells 300 and 260 feet deep. The system is owned by a private company and was established in 1898 at a cost of $30,000. The plant is located on the south bank of the river. Three deep well pumps and one pressure pump are used. The capacity of the latter is 100,000 gallons.

Lebanon, St. Clair county (1812) has no general water supply.

Lemont, Cook county (2,449) obtains its water supply from a well 2,200 feet deep. The system is owned by the city and was established in 1892.

Lena, Stephenson county (1,252) obtains it water supply from a well 800 to 900 feet deep. The system is owned by the city.

LeRoy, McLean county (1629) obtains its water from a well 100 feet deep. The system is owned by the city and was established in 1893.

Lewistown, Fulton county (2,504) obtains its water supply from wells 12 to 16 feet deep, in the Spoon river bottoms. The system is owned by the city and was established in 1888 at a cost of $30,000. The plant is located three miles from the city. The daily consumption is 60,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 2127. APRIL (?) 1897.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon
Potassium, K	1.5	Potassium nitrate	KNO_3	3.8	.22
Sodium, Na	9.5	Sodium nitrate	$NaNO_3$	4.6	.26
Magnesium, Mg	23.7	Sodium chloride	NaCl	11.6	.67
Calcium, Ca	61.4	Sodium sulphate	Na_2SO_4	11.5	.67
Silica, Si	4.0	Magnesium sulphate	$MgSO_4$	48.8	2.84
Nitrate, NO_3	5.4	Magnesium carbonate	$MgCO_3$	50.0	2.91
Chloride, Cl	7.0	Calcium carbonate	$CaCO_3$	153.3	8.94
Sulphate, SO_4	46.6	Oxide of iron and Aluminium	Fe_2O_3 + Al_2O_3	1.1	.06
		Silica	SiO_2	8.5	.49
			Total	293.1	17.06

Lexington, McLean county (1,415) is located one mile from the Mackinac river. The city supply is obtained from one well 115 feet deep. The system is owned by the city and was established in 1895. The system includes a stand pipe of 33,000 gallons capacity. A Gould deep well pump is used. The daily consumption is 50,000 gallons. Water is not treated. The supply is said to be fine.

Lincoln, Logan county (8,962, estimated 12.000) situated on Salt Creek, obtains its water supply from driven wells 30 and 35 feet deep in gravel beds near Salt Creek. The system is owned by a company and was established in 1886 at a cost of $85.000. The creek water was used until 1902 when the wells were put in. The pumps have a capacity of 4,500,000 and the daily consumption is 700,000 gallons.

Litchfield, Montgomery county (5,918) is situated on Long Branch Creek. The water supply is obtained from Shoal Creek, etc.

For sanitary analysis see final table.

Lockport, Will county (2,659) situated on Desplaines river, the Illinois and Michigan Canal and the drainage canal. The water supply is obtained from deep rock wells. The system is owned by the city and was established in 1890.

For sanitary analysis see final table.

McHenry, McHenry county (1,013, estimated 1,100) situated on Fox river, obtains its water supply from an artesian well. The system is owned by the city and was established in 1897 at a cost of $21,600. The system includes a standpipe.

McLeansboro, Hamilton county (1,758, estimated 2,500) obtains its water supply from wells and ponds. The system is owned by the city and was established in 1898 at a cost of $12,000.

Macomb, McDonough county (5,375) obtains its water supply from wells 40 feet and 1,300 to 1,500 feet deep. The system is owned by the city and was established in 1893.

Madison, Madison county (1,979, estimated 4,000) is situated on Mississippi river. It obtains its water supply from the Granite City Water Company, which see.

Marengo, McHenry county (2,005) located on Kishwaukee river. The supply is obtained from wells 20 feet deep. The system is owned by the city and was established in 1903. A Worthington pump is used.

Marion, Williamson county (2,510) has sent no report.

Marissa, St. Clair county (1,086) has no general water supply.

Maroa, Macon county (1,213) obtains its water supply from driven wells 82 feet deep. The system is owned by the city, and was established in 1892 at a cost of $12,000. Two deep well and one force pump are used. The daily consumption is 100,000 gallons.

For sanitary analysis see final table.

Marseilles, LaSalle county (2559) is located on the Illinois river and the Illinois and Michigan canal. The city supply is obtained from artesian wells 612 feet deep. The system is owned by a private company and was established in 1902 at a cost of $50,000. Two triplex pumps are used. The daily consumption is 120,000 gallons.

Marshall, Clark county (?77) has sent no report. The water supply is obtained from a driven well 21 feet deep.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Sodium, Na	9.4	Sodium nitrate	$NaNO_3$	3.5	.20
Magnesium, Mg	14.3	Sodium chloride	NaCl	8.3	.48
Silica, Si	5.1	Sodium sulphate	Na_2SO_4	16.0	.93
Calcium, Ca	52.6	Magnesium sulphate	$MgSO_4$	20.0	1.17
Nitrate, NO_3	2.5	Magnesium carbonate	$MgCO_3$	35.5	2.07
Chloride, Cl	5.0	Calcium carbonate	$CaCO_3$	131.5	7.67
Sulphate, SO_4	27.3	Oxide of iron and Aluminium	Fe_2O_3+ Al_2O_3	2.4	.14 .....
		Silica	SiO_2	10.8	.63
			Total	228.0	13.29

Martinsville, Clark county (1,000) is located on North Fork Creek. It has no general water supply.

Mascoutah, St. Clair county (2,171) is situated near Silver Creek. The water supply is obtained from wells 48 feet deep. The system is owned by the city and was completed in 1906 at a cost of $15,000.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 14566, JULY. 11, 1906.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Sodium, Na	49.7	Sodium nitrate	$NaNO_3$	1.0	.06
Ammonium, NH_4	.7	Sodium chloride	NaCl	125.4	7.31
Magnesium, Mg	63.0	Ammonium chloride	NH_4Cl	2.1	.12
Calcium, Ca	216.3	Magnesium chloride	$MgCl_2$	10.2	.59
Iron Fe	9.4	Magnesium sulphate	$MgSO_4$	298.6	17.42
Alumina	5.4	Calcium sulphate	$CaSO_4$	118.8	6.93
Nitrate, NO_3	.7	Calcium carbonate	$CaCO_3$	452.5	26.39
Chlorine, Cl	85.0	Iron carbonate	$FeCO_3$	19.5	1.14
Sulphate, SO_4	322.0	Alumina	Al_2O_3	5.4	.31
Silica, SiO_2	26.8	Silica	SiO_2	26.8	1.56
Bases	.4	Bases		.4	.02
			Total	1060.7	61.85

Mason City, Mason county (1,890) has sent no report. According to *Leverett, the water supply is obtained from 10 wells 72 feet deep.

Mattoon, Coles county (9,622, estimated 12,600) obtains its water supply from deep wells. The system is owned by the Mattoon Clear Water Company and was established in 1885. The pumps used are Smith-Vaile, Cook, Hughes and Deane. The daily consumption is 600,000 gallons. There is a reservoir of 5,000,000 gallons capacity for the use in case of fire. At present (1907) Mattoon has under consideration the building of a reservoir to supply water for manufacturing purposes.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF MATTOON.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
1775	Aug. 29, 1896	Distinct.	Yellow	000	485.6	16.0	7.6	9.	.288	.01	.1	.....
10625	Sept. 18, 1902	Decided.	..do....	000	441.2	11.0	6.3	9.4	.176	.000	.004	.....
10672	Oct. 5, 1902	..do.....	..do....	000	527.6	16.0	8.8	7.2	.320	.004	.086	.....
10673	..do.....	..do.....	..do....	000	485.6	15.0	10.3	8.4	.624	.003	.087	.....
10674	..do.....	..do.....	..do....	000	542.0	14.0	8.8	8.4	.320	.001	.129	.....
13279	June 27, 1905	Distinct.	..do....	000	476.4	17.5	6.4	7.0	.198	.001	.040	.....
13874	Jan. 2, 1905	Decided..	.2	000	462.0	9.0	5.75	2.804	.162	.002	.080	445.
14351	April 13, 1906	V	Yellow	000	536.0	14.0	5.6	9.60	.152	.010	.119	424.
14352	..do.....	Decided..	.05	Oily ...	526.0	13.5	5.9	7.60	.216	.003	.32	392.

* Leverett, page 689 Monograph XXXVIII U. S. Geol. Survey.

An analysis of the mineral content gave the following results:

LABORATORY NO. 1373. JUNE 14, 1896.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	1373.			1, 373	1, 373
Potassium, K	2.7	Potassium nitrate,	KNO_3	.4	.02
Sodium, Na	25.6	Potassium chloride,	KCl	4.7	.27
Ammonium, (NH_4)	13.	Sodium chloride,	NaCl	20.9	1.22
Magnesium, Mg	52.9	Sodium sulphate,	Na_2SO_4	39.6	2.30
Calcium, Ca	103.3	Sodium carbonate,	Na_2CO_3	15.6	.90
Ferrous, Fe	3.8	Ammonium carbonate,	$(NH_4)_2CO_3$	34.3	2.00
Aluminium, Al	10.2	Magnesium carbonate,	$MgCO_3$	185.1	10.79
Silica, Si	26.7	Calcium carbonate,	$CaCO_3$	257.9	15.04
Nitrate, NO_3	.2	Ferrous carbonate,	$FeCO_3$	8.	.47
Chloride, Cl	15.0	Alumina,	Al_2O_3	19.2	1.11
Sulphate, SO_4	26.7	Silica,	SiO_2	25.2	1.46
		Total		610.9	25.58

Maywood, Cook county (4,532) is situated on Desplaines river. The water supply is obtained from artesian wells 1,500 feet deep. The system is owned by the city, having been established in 1895 at a cost of $200,000. Worthington pumps are used. The daily consumption is 450,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 5633. AUGUST 14, 1899.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	4.6	Potassium nitrate,	KNO_3	1.1	.06
Sodium, Na	42.2	Potassium chloride,	KCl	7.9	.46
Ammonium, (NH_4)	.5	Sodium chloride,	NaCl	.8	.05
Magnesium, Mg	49.5	Sodium sulphate,	Na_2SO_4	129.4	7.55
Calcium, Ca	93.6	Ammonium sulphate,	$(NH_4)_2SO_4$	1.8	.10
Ferrous, Fe	.4	Magnesium sulphate,	$MgSO_4$	190.2	11.09
Aluminium, Al	.4	Magnesium carbonate,	$MgCO_3$	39.1	2.27
Silicon, Si	6.5	Calcium carbonate,	$CaCO_3$	233.9	13.64
Nitrate, NO_3	.7	Ferrous carbonate,	$FeCO_3$	.8	.05
Chloride, Cl	4.2	Alumina,	Al_2O_3	.8	.05
Sulphate, SO_4	240.3	Silica,	SiO_2	13.9	.81
		Total		619.7	36.13

Melrose Park, Cook county (2592) obtains its water supply from wells one-half mile from business center. The system is owned by the city and was established at a cost of $42,000. One 700,000 gallon Worthington and one 1,500,000 gallon Smith-Vaile pump are used.

Mendota, LaSalle county (3,736) obtains its water supply from two wells 480 feet deep. The system is owned by the city and was established in 1887.

Air lift pumps with 1,000,000 gallons daily capacity are used.

For sanitary analysis see final table.

Metropolis, Massac county (4,069) is located on Ohio river. The water supply is obtained from the river. The system is owned by the the city and was established about 1891.

For sanitary analysis see final table.

Milford, Iroquois county (1,077; estimated at 1,400) is located on Sugar Creek. The water supply is obtained from wells 65 feet deep. The system is owned by the city, and was established in 1896 at a cost of $15,000. Gould triplex pumps with 300,000 gallons daily capacity are used. The daily consumption is 80,000 to 125,000 gallons.

Millstadt, St. Clair county (1,172) has no general supply.

Minonk, Woodford county (2,545) obtains its water supply from a well 1,765 feet deep. The system is owned by the city. A straight lift pump of 60 gallons capacity per minute is used. The daily consumption is 58,000 gallons.

For sanitary analysis see table, page—

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 3539. MAY 3, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	27.4	Potassium nitrate,	KNO_3	2.9	.17
Sodium, Na	845.7	Potassium chloride,	KCl	51.1	2.98
Ammonium (NH_4)	1.0	Sodium chloride	NaCl	1575.0	91.90
Magnesium, Mg	4.2	Sodium sulphate,	Na_2SO_4	175.4	10.23
Calcium, Ca	8.2	Sodium carbonate,	Na_2CO_3	372.8	21.75
Ferrous, Fe	.7	Ammonium carbonate,	$(NH_4)_2CO_3$	2.7	.12
Aluminium, Al	.53	Magnesium carbonate	$MgCO_3$	14.6	.80
Silicon, Si	4.4	Ferrous carbonate,	$FeCO_3$	1.5	.08
Nitrate, NO_3	1.76	Alumina,	Al_2O_3	1.0	.06
Chloride, Cl	980.0	Silica,	SiO_2	9.4	.55
Sulphate, SO_4	118.56	Calcium carbonate,	$CaCO_3$	20.4	1.19
		Total		2226.8	129.83

Moline, Rock Island county (17,248, estimated 23,000) is located on the Mississippi river from which the city supply is obtained. The system is owned by the city and was established in 1883 at a cost of $73,453. The water is filtered through Jewell filters. Lime and iron are used in the treatment. The pumps used are two Holly, six million gallons daily capacity and five million gallons daily capacity and one Deane, one and one-half million gallons daily capacity. The daily consumption is 2,385,450 gallons.

For sanitary analysis see the following table:

SANITARY ANALYSES OF WATER FROM MISSISSIPPI RIVER–UNFILTERED–CITY SUPPLY OF MOLINE, ILLINOIS.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
								Free.	Albuminoid.							
13840	Dec. 18, 1905	Decided	.6	3Earthy	216.	1.5	12.9	.088	.272	.000	.28	136.0	. . . . .	1 ?	2 +	. . . . .
13918	Jan. 15, 1906	. . do	.4	000	245.	1.0	11.65	.088	.240	.001	.440	88.0	1,000	1+	1 +	1+
															1 –	1–
14025	Feb. 19, 1906	. . do	.5	000	264.	2.5	11.25	.112	.216	.003	.24	171.4	8,100	1–	1 +	1+
															1 –	1–
14231	April 16, 1906	Distinct	Mud. . .	2Earthy	202.	1.7	6.0	.080	.280	.001	.04	62.0	12,500	1+	1 ?	2–
															1 +	
14366	May 14, 1906	Decided	.4	000	391.	1.5	14.75	.176	.428	.006	.24	93.0	4,800	1+	2+	2–
14786	Aug. 13, 1906	. . do	Mud . . .	000	508.	2.0	16.00	.024	.560	.050	.27	128.	320	1+	2 +	2–
14952	Sept. 10, 1906	. . do	. . do . . .	2Earthy	384.	2.0	15.9	.016	.480	.010	.230	124.8	900	1 ?	2 +	2+
15299	Nov. 5, 1906	. . do	.8	000	195.	1.0	13.9	.056	.264	.002	.320	117.1	*133,000	1+	1 +	1+
															1 –	1–
15300	. . do	. . do	.8	000	192.	1.0	9.95	.056	.312	.002	.240	119.0	*272,000	1+	2 +	1+
																1–
15301	. . do	. . do	.8	000	200.	1.0	13.7	.064	.344	.002	.280	126.7	*690,000	1+	2 +	2–
15397	Nov. 26, 1906	. . do	Mud . . .	000	235.	2.0	12.35	.048	.280	.002	.680	130.6	8,200	1–	2 –	2–
15399	. . do	. . do	. . do . . .	000	221.	2.0	12.65	.040	.280	.001	.440	126.7	5,500	1 +	2 +	2–
15400	. . do	. . do	. . do . . .	000	201.	2.0	12.7	.080	.264	.001	.440	126.7	6,700	1 –	2 –	2+

* First set of plates were lost. Second set plated after samples had stood at room temperature for ten hours.

SANITARY EXAMINATION OF WATER FROM THE MISSISSIPPI RIVER—FILTERED—CITY SUPPLY OF MOLINE, ILLINOIS.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as—				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
13841	Dec. 18, 1905	Decided.....	.4	3Earthy...	162.	1.5	9.10	.068	.240	.000	.28	86.6	.....	1+	2–	2–
13919	Jan. 15, 1906	..do.....	.2	.000	155.	1.5	7.45	.096	.192	.001	.360	107.2	238	1–	2?	1+1–
14026	Feb. 19, 1906	..do.....	.2	.000	183.	2.0	7.4	.112	.136	.003	.32	128.6	1,690	.....	2+	2–
14232	April 16, 1906	Clear.....	.1	2Earthy...	104.	1.1	3.80	.080	.176	.005	.80	40.0	1,550	1–	2+	2–
14367	May 14, 1906	..do.....	.00	.000	127.	2.0	5.2	.064	.174	.006	.20	52.	7	1–	2–	2–
14787	Aug. 13, 1906	V. Slight . . .	Muddy.	.000	164.	2.0	7.85	.024	.184	.000	.48	104.7	61	1?	2+	2–
14953	Sept. 10, 1906	Clear.....	.00	.000	214.	2.0	8.3	.024	.192	.000	.200	109.4	13	?	1+1–	2–
15302	Nov. 5, 1906	..do.....	.3	.000	107.	1.0	7.85	.032	.160	.002	.320	73.0	2,400	1+	2–	2–
15398	Nov. 26, 1906	..do.....	.6	.000	130.	3.0	7.80	.056	.160	.000	.440	82.0	270	1+	1+1–	1+1–

An analysis of the mineral content gave the following results:

Laboratory No. 14366 and No. 14367, July 3, 1906.

Ions.	Parts Per Million. Raw. 14366	Filtered. 14367	Hypothetical Combinations.		Parts Per Million. 14366	14367	Grains Per U. S. Gallon. 14366	14367
Sodium, Na	5.9	8.7	Sodium nitrate,	$NaNO_3$	1.5	1.2	.09	.07
Ammonium, (NH_4)	.2	.1	Sodium chloride,	NaCl	2.5	3.3	.15	.19
Magnesium, Mg	11.0	4.7	Sodium sulphate,	Na_2SO_4	13.9	21.9	.81	1.27
Calcium, Ca	28.7	23.3	Ammonium sulphate,	$(NH_4)_2SO_4$	.7	.4	.04	.02
Iron, Fe	6.1	....	Magnesium sulphate,	$MgSO_4$	1.1	5.9	.06	.34
Alumina, Al_2O_3	12.4	1.5	Magnesium carbonate,	$MgCO_3$	37.4	12.1	2.18	.71
Nitrate, NO_3	1.1	.9	Calcium carbonate,	$CaCO_3$	71.6	58.2	4.18	3.39
Chloride, Cl	1.5	2.0	Iron carbonate,	$FeCO_3$	12.6	.....	.73	.....
Sulphate, SO_4	10.8	19.8	Alumina,	Al_2O_3	12.4	1.5	.72	.09
Silica, SiO_2	104.1	31.7	Silica,	SiO_2	104.1	31.7	6.12	1.85
Bases,	42 0	.4	Bases,		42.0	.4	2.45	.02
			Total		299.8	136.6	17.53	7.95

Momence, Kankakee county (2,026, estimated 2,550) is located on the Kankakee river from which the water supply was first obtained. It is now obtained from three wells 100 feet deep in limestone. The system is owned by the city and was established in 1905 at a cost of $35,000. The daily consumption is 100,000 gallons.

For sanitary analysis see final table.

Monmouth, Warren county (7,460) obtains its water supply from three artesian wells from 1,100 to 1,300 feet deep. The system is owned by the city.

Monticello, Piatt county (1,982, estimated 2,500) is located on the Sangamon river. The city water supply is obtained from two wells 300 feet deep. The system is owned by the city and was installed in 1902 at a cost of $30,000. The daily consumption is about 100,000 gallons.

Morgan Park, Cook county (2,329) obtains its water supply from two wells 1,100 and 1,400 feet deep. The system is owned by the city and was established in 1892.

Morris, Grundy county (4,273, estimated 5,500) is located on the Illinois river. The city supply is obtained from artesian wells, one 800 feet and one 650 feet deep. The system is owned by the city and was established in 1893 at a cost of $50,000. The reservoir is located under the city hall. Two Deane compound pumps are used with a capacity of 100,000 gallons each. The daily consumption is 100,000 gallons.

For sanitary analysis see final table.

Morrison, Whiteside county (2,308, estimated 2,500) is located on Rock Creek. The city water supply is obtained from a spring and an artesian well 1,645 feet deep. The system is owned by the city and was established in 1881 at a cost of $50,000. The standpipe is one mile from the pumping station. Compound duplex pumps with capacity of one million gallons each are used. The daily consumption is 225,000 gallons. Flow of spring is estimated at 200 gallons per minute and flow of artesian well at 60 gallons per minute.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF MORRISON.

Serial number.	Date of collection	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.
		Turbidity.	Color.	Odor.				Free.	Albuminoid.		
3093	Dec. 28, 1897	Slight	.01	.000	324.	1.	1.4	.18	.03	.000	.12
3273	Feb. 15, 1898	Very slight	.02	.000	289.2	1.6	.9	.224	.022	.000	.65
3274	do	do	.02	.000	291.2	1.6	.9	.186	.014	.003	.80
3302	Feb. 23, 1898	do	.02	.000	296.8	3.7	1.0	.001	.008	.000	1.0
3303	do	do	.02	.000	384.0	1.6	1.1	.194	.010	.000	.35
10620	Sept 15, 1902	Clear	.0	.000	338.8	5.0	1.2	.088	.02	.001	1.52

An analysis of the mineral content gave the following results; Lab. No. 3,093, Dec. 25, 1897.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	7.8	Potassium nitrate.	KNO_3	.9	.06
Sodium, Na	10.2	Potassium chloride,	KCl	2.1	.11
Ammonium, (NH_4)	.24	Potassium sulphate,	K_2SO_4	13.4	.81
Magnesium, Mg	31.8	Sodium sulphate,	Na_2SO_4	19.0	1.15
Calcium, Ca	61.6	Sodium carbonate,	Na_2CO_3	6.6	.38
Silicon, Si	3.2	Ammonium carbonate,	$(NH_4)_2CO_3$	.6	.03
Nitrate, NO_3	5.0	Magnesium carbonate,	$MgCO_3$	110.8	6.45
Chloride, Cl	1.0	Calcium carbonate,	$CaCO_3$	153.9	8.97
Sulphate, SO_4	20.8	Oxide of iron and Alumina,	$Fe_2O_3 + Al_2O_3$	.1	.01
		Silica,	SiO_2	6.6	.38
		Total		314.0	18.34

Mound City, Pulaski county (2,705, estimated 3,300) is located on the Ohio river. The city water supply is obtained from artesian wells 30 to 60 feet deep. The system is owned by Mound City Water, Light, Power, Heat & Mfg. Co., and was installed in 1900 at a cost of $50,000. The compound duplex pumps with daily capacity of 1,500,000 gallons each are used. The daily consumption is about 300,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 8927, DEC. 29, 1900, AND 14052, APRIL 9, 1906.

Ions	Parts Per Million.		Hypothetical Combinations	Parts Per Million.		Grains Per U. S. Gal.	
	8927	14052		8927	14052	8927	14052
Potassium, K	22.8	5.3	Potassium nitrate, KNO_3	.3	1.8	.02	.1
Sodium, Na	33.6	47.6	Potassium chloride, KCl	43.3	8.8	2.51	.5
Ammonium, (NH_4)	.34	.4	Sodium Chloride, NaCl	74.8	100.3	4.34	5.85
Magnesium, Mg	9.7	10.9	Sodium sulphate, Na_2SO_4	13.	20.4	.75	1.19
Calcium, Ca	27.3	38.9	Sodium carbonate, Na_2CO_3	.....	3.5	.....	.20
Ferrous, Fe	.6	.6	Ammonium carbonate, $(NH_4)_2CO_3$	.9	1.1	.05	.06
Aluminium, Al	.2	.3	Magnesium carbonate, $MgCO_3$	33.6	37.7	1.95	2.20
Silicon, Si	4.1	.9	Calcium sulphate, $CaSO_4$	12.4	.....	.72	.....
Nitrate, NO_3	.2	1.1	Calcium carbonate, $CaCO_3$	84.3	97.1	4.89	5.66
Chloride, Cl	66.	65.	Iron carbonate, $FeCO_3$	1.3	1.2	.07	.07
Sulphate, SO_4	12.2	13.8	Alumina, Al_2O_3	.3	.3	.02	.02
			Silica, SiO_2	8.8	9.1	.51	.53
			Total	273.	281.3	15.83	16.39

Mount Carmel, Wabash county (4,311) is situated on the Wabash river, from which the water supply is obtained. The system is owned by a company. The water is piped to a settling basin from which it is pumped to the mains and to a stand tower.

Mount Carroll, Carroll county (1,965) is located on Carroll Creek. The water supply is obtained from a well 2,500 feet deep. The system is owned by the city and was established in 1888.

Mount Morris, Ogle county (1,048) obtains its water supply from a well 500 feet deep. The system is owned by the city and was established in 1895 at a cost of $3,000. The system includes a stand tower. An Otto gasoline engine is used.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 2598, AUG. 25, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S.Gallon.
Potassium, K	2.0	Potassium nitrate,	KNO_3	5.2	.30
Sodium, Na	15.5	Sodium nitrate,	$NaNO_3$	57.3	3.34
Magnesium, Mg	41.1	Magnesium nitrate,	$Mg(NO_3)_2$	3.2	.10
Calcium, Ca	78.6	Magnesium chloride,	$MgCl_3$	74.9	4.37
Ferrous, Fe	.6	Magsesium sulphate,	$MgSO_4$	30.2	1.76
Aluminium, Al	.5	Magnesium carbonate,	$MgCO_3$	53.6	3.12
Silica, Si	6.2	Calcium carbonate,	$CaCO_3$	196.2	11.50
Nitrate, NO_3	47.5	Ferrous carbonate,	$FeCO_3$	1.3	.07
Chloride, Cl	28.0	Alumina,	Al_2O_3	1.0	.06
Sulphate, SO_4	24.1	Silica,	SiO_2	13.1	.75
		Total		436.0	25.47

Mount Olive, Macoupin county (2,935) obtains its water supply from a reservoir located one and one-quarter miles from the city. The reservoir covers 45 acres and has a capacity of 250,000,000 gallons. The system was installed in 1905 and is owned by the city.

Mount Pulaski, Logan county (1,643) obtains its water supply from three wells. The system is owned by the city and was established in 1895.

Mt. Sterling, Brown county (1,960) obtains its water supply from well 2,500 feet deep, located on the outskirts of the city. The system is owned by the city. Air lift pumps are used. The daily consumption is 60,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

Ions.	Amounts Stated in Parts per Million.		
Laboratory No.	3,373	3,374	9,648
Date	Feb. 22, 1898.	Feb. 22, 1898.	Nov. 2, 1901.
Potassium, K	58.6	9.9	18.6
Sodium, Na	1064.6	206.7	445.2
Ammonium (NH_4)	.6	.....	.7
Magnesium, Mg	72.4	23.6	20.1
Calcium, Ca	170.8	39.6	56.6
Ferrous, Fe	4.0	1.4	21.0
Aluminium, Al	1.5	.8	15.
Silicon, Si	5.6	5.1	13.6
Nitrate, NO_3	.7	.9	.9
Chloride, Cl	1310.0	73.0	445.0
Sulphate, SO_4	855.1	61.6	268.5

HYPOTHETICAL COMBINATIONS.

		Parts per Million			Grains per U. S. Gallon.		
		3373	3374	9648	3373	3374	9648
Potassium nitrate,	KNO_3	1.2	1.5	1.5	.06	.09	.09
Potassium chloride,	KCl	111.0	17.8	34.3	6.47	1.030	2.00
Sodium chloride,	NaCl	2071.7	106.4	707.4	120.85	6.20	41.26
Sodium sulphate,	Na_2SO_4	770.0	90.5	397.2	44.92	5.28	23.17
Sodium carbonate,	Na_2CO_3	.....	312.5	87.9	.....	17.46	5.12
Ammonium sulphate,	$(NH_4)_2SO_4$	2.3	.....	.....	.13	.....	.....
Ammonium carbonate,	$(NH_4)_2CO_3$	.....	.....	1.9	.....	.....	.11
Magnesium sulphate,	$MgSO_4$	359.9	.....	.....	20.99	.....	.....
Magnesium carbonate,	$MgCO_3$	.....	82.4	70.1	.....	4.80	4.08
Calcium sulphate.	$CaSO_4$	63.8	.....	.....	3.75	.....	.....
Calcium carbonate.	$CaCO_3$	379.8	97.8	141.5	12.15	5.70	8.26
Ferrous carbonate,	$FeCO_3$	8.2	2.9	43.5	.48	.16	2.51
Alumina,	Al_2O_3	2.9	1.6	28.2	.16	.09	1.64
Silica,	SiO_2	12.0	10.8	28.8	.70	.63	1.68
Total.....		3782.8	724.2	1542.3	210.66	41.44	89.92

Mount Vernon, Jefferson county (5,216, estimated 10,000) is located on Casey Fork Creek. The city water supply is obtained from artificial lakes, one located four and one-half miles north of the city and one in the city. The system is owned by a private company and was established about 1891.

For sanitary analysis see final table.

Moweaqua, Shelby county (1,478, estimated 2,000) obtains its water supply from well 56 feet deep. The system is owned by the city and was established in 1893 at a cost of $50,000. Pressure direct from pump. Water is obtained from limestone stratum.

For sanitary analysis see final table.

Murphysboro, Jackson county (6,463, estimated 9,000) is situated on Big Muddy river, from which it obtains its water supply. The system is owned by a private company and was installed in 1890 at a cost of about $75,000. Two duplex condensing pumps with capacity of 2,500,000 gallons each are used. The daily consumption is 1,000,000 gallons.

Naperville, DuPage county (2,629, estimated 3,100) is situated on DuPage river. The city water supply is obtained from one well 1,425 feet deep; water bearing stratum is the St. Peter's sandstone. The system is owned by the city and was established in 1904 at a cost of $3,100. One Snow pump is used. The daily consumption is 9,000 gallons

For sanitary analysis see final table.

Nashville, Washington county (2,184, estimated 2,600) situated on Town Creek, has no general water supply.

Nauvoo, Hancock county (1321) located on Mississippi river, has no general water supply. A proposed supply is to be pumped from Mississippi river.

Neoga, Cumberland county (1,126, estimated 1220) situated one mile east of the Little Wabash river, has no general water supply.

Newman, Douglas county (1,166) located on Brushy Fork Creek, has no general water supply.

Newton, Jasper county (1,630, estimated 3,000) is located on the Embarras river, from which it obtains its water supply. The system is owned 'by the city and was established in. 1894 at a cost of $10,000. The system includes a stand tower of 80,000 gallons capacity. The daily consumption is 100,000 gallons.

Nilwood, Macoupin county (1,378) has no general water supply.

Nokomis, Montgomery county (1,371, estimated 1,500) obtains its water supply from six bored wells 41 feet deep. The system is owned by the city, having been installed in 1894 at a cost of $10,000. A Gardner fire pump of one million gallons capacity is used. The daily consumption is about 60,000 gallons.

Normal, McLean county (3,795, estimated 4,500) obtains its water supply from wells 180 feet deep. The system is owned by the city and was established in 1898 at a cost of $20,000. The daily consumption is 75,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 4273, OCT. 27, 1898.

Ions.	Parts Per Million.	Hypothetical combinations.		Parts Per Million.	Grains Per U.S.Gallon.
Potassium, K	2.8	Potassium nitrate,	KNO_3	2.8	.16
Sodium, Na	71.8	Pottasium chloride,	KCl	3.3	.19
Ammonium, (NH_4)	1.4	Sodium chloride,	NaCl	13.8	.80
Magnesium, Mg	23.8	Sodium carbonate,	Na_2CO_3	152.9	8.92
Calcium, Ca	52.3	Ammonium carbonate,	$(NH_4)_2CO_3$	3.7	.21
Ferrous, Fe	1.4	Magnesium carbonate,	$MgCO_3$	82.9	4.83
Aluminium, Al	.7	Calcium carbonate,	$CaCO_3$	130.7	7.62
Silica, Si	7.6	Ferrous carbonate,	$FeCO_3$	2.8	.16
Nitrate, NO_3	1.7	Alumina,	Al_2O_3	1.3	.08
Chloride, Cl	10.0	Silica,	SiO_2	16.2	.91
		Total		410.4	23.88

North Chicago, Lake county (1,150) is located on Lake Michigan and obtains its water supply from the lake. The system is owned by the village.

For sanitary analysis see final table.

North Peoria, Peoria county (2,358) has been annexed to Peoria and is supplied by the Peoria Water Works Co.

Oakland, Coles county (1,198) has no general water supply.

Oak Park, Cook county (7,500). Water supply is obtained from deep wells. The system is owned by a company.

O'Dell, Livingston county (1,000) obtains water supply from well 1,365 feet deep. The system is owned by the village and was established in 1897. There is a Ramsey pump to send water to a reservoir and an Ingersoll Sargent air compressor with a capacity of 3,000 gallons per hour. The daily consumption is about 2,500 gallons.

Odin, Marion county (1,180) has sent no report.

O'Fallon, St. Clair county (1,267, estimated 2,000) has no general water supply. A system is under consideration and will probably be installed during the spring of 1907.

Olney, Richland county (4,260) obtains its water supply from the Fox river. The system is owned by the city.

Onarga, Iroquois county (1,270, estimated 1,600) is situated near Spring Creek. Its water supply is obtained from wells from 100 to 110 feet deep. The system is owned by the city and was established in 1904 at a cost of $18,500.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 13946, FEB. 10, 1906.

Ions.	Parts Per Million.	Hypothetical combinations.		Parts Per Million.	Grains Per U.S.Gallon.
Potassium, K	2.5	Potassium nitrate,	KNO_3	2.6	.15
Sodium, Na	70.2	Potassium chloride,	KCl	2.9	.17
Ammonium, NH_4	2.4	Sodium chloride,	NaCl	10.1	.59
Magnesium, Mg	72.1	Ammonium sulphate,	$(NH_4)_2SO_4$	8.8	.51
Calcium, Ca	184.8	Sodium sulphate,	Na_2SO_4	204.2	11.90
Ferrous, Fe	.7	Magnesium sulphate,	$MgSO_4$	356.4	20.79
Nitrate, NO_3	1.6	Calcium sulphate,	$CaSO_4$	5.2	.30
Chloride, Cl	7.5	Iron carbonate,	$FeCO_3$	457.6	26.69
Silica, Si	14.4	Alumina,	Al_2O_3	1.5	.09
Sulphate, SO_4	432.4	Silica,	SiO_2	4.6	.26
		Bases,		14.4	.84
		Total		1068.3	62.29

Oquawka, Henderson county (1,010) has no general water supply.

Oregon, Ogle county (1,577) has sent no report. The city water supply is said to be obtained from an artesian well 1,600 feet deep.

For sanitary analysis see final table.

The analysis of the mineral content gave the following results:

LABORATORY NO. 14431, JUNE 23, 1906.

Ions.	Parts Per Million.	Hypothetical combinations.		Parts Per Million.	Grains Per U.S.Gallon.
Potassium, K	5.6	Potassium nitrate,	KNO_3	.8	.05
Sodium, Na	5.5	Potassium chloride,	KCl	10.1	.50
Ammonium, NH_4	.1	Sodium chloride,	NaCl	2.0	.12
Magnesium, Mg	37.9	Sodium sulphate,	$Na_2 SO_4$	14.5	.85
Calcium, Ca	64.7	Ammonium sulphate,	$(NH_4)_2 SO_4$	.4	.02
Iron, Fe	.3	Magnesium sulphate,	$MgSO_4$	8.0	.47
Alumina, $Al_2 O_3$	.8	Magnesium carbonate,	$MgCO_3$	125.7	7.33
Nitrate, NO_3	.5	Calcium carbonate,	$CaCO_3$	161.5	9.42
Chlorine, Cl	6.0	Iron carbonate,	$FeCO_3$	.6	.03
Sulphate, SO_4	16.5	Alumina,	$Al_2 O_3$	.8	.05
Silica, SiO_2	6.7	Silica,	SiO_2	6.7	.39
Bases,	.4	Bases,	.....	.4	.02
		Total		331.5	19.34

Ottawa, LaSalle county (10,588), is sitauted at the junction of the Illinois and Fox rivers. The water supply is obtained from artesian wells. The system is owned by the city and was established in 1895 at a cost of $160,000. The daily consumption is 439,351 gallons.

For sanitary analysis see following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF OTTAWA.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
41	Oct. 3, 1895	None.	.0	.000	385.2	7.0	5.	.008	.272	.000	.16	.....
407	Jan. 18, 1896	.....	.....	.....	338.	14.	.8	.09	.045	.008	.35	.....
419	Jan. 21, 1896	.....	.....	.....	364.4	12.	1.8	.376	.098	.005	.224	.....
422	Jan. 22, 1896	.....	.....	.....	426.8	14.	1.1	.73	.032	.002	.075	.....
1444	Oct. 5, 1896	Slight.	.03	.000	358.8	16.	1.	.424	.006	.000	.02	.....
1476	Oct. 7, 1896	Decided.	.15	.000	344.0	3.2	7.	.002	.256	.009	1.8	.....
1477	..do.	None.	.04	.000	360.	14.	1.4	.52	.088	.000	.2	.....
1495	Oct. 11, 1896	Slight.	.02	.000	346.4	16.0	1.1	.4	.032	.000	.06	.....
1507	Oct. 14, 1896	..do.	.05	.000	446.6	23.	1.6	.64	.022	.000	.06	.....
1508	..do.	None.	.04	.000	368.	21.0	1.2	.72	.016	.000	.06	.....
2022	Mar. 16, 1897	Slight.	.04	.000	372.8	25.	1.	.512	.016	.002	.05	.....
3876	July 25, 1898	..do.	.02	.000	370.4	31.	1.8	.51	.018	.000	.1	.....
4573	Jan. 3, 1899	..do.	.02	.000	378.0	32.0	1.3	.36	.024	.000	.10	.....
14618	July 10, 1906	Clear.	.2	.0	434.	56.0	1.95	.72	.064	.000	.56	310.0
14938	Sept. 10, 1906	..do.	.0	.0	409.	31.	1.80	.654	.066	.000	.240	320.6
14939	..do.	..do.	.0	.0	408.	28.	1.25	.580	.062	.000	.040	322.5

The analysis of the mineral content gave the following results:

LABORATORY NO. 2022, MARCH 16, 1897.

Ions.	Parts Per Millions.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	2022.			2,022	2,022
Potassium, K	9.7	Potassium nitrate,	KNO_3	.4	.02
Sodium, Na	46.1	Potassium chloride,	KCl	18.3	1.07
Magnesium, Mg	26.1	Sodium chloride,	NaCl	26.8	1.56
Calcium, Ca	64.0	Sodium sulphate,	Na_2SO_4	16.5	.96
Ferrous, Fe	.4	Sodium carbonate,	Na_2CO_3	69.7	4.06
Aluminium, Al	.3	Magnesium carbonate,	$MgCO_3$	95.2	5.55
Silica, Si	11.1	Calcium carbonate,	$CaCO_3$	159.9	9.33
Nitrate, NO_3	.2	Iron carbonate,	$FeCO_3$	1.7	.10
Chloride, Cl	25.0	Silica,	SiO_2	10.2	.59
Sulphate, SO_4	4.1				
		Total		398.7	23.24

Palatine, Cook county (1,020, estimated 1,200) obtains its water supply from an artesian well 176 feet deep. The system is owned by the city and was established in 1896 at a cost of $20,000. A Westinghouse pump of 80,000 gallons capacity is used. The daily consumption is 45,000 gallons.

Pana, Christian county (5,530, estimated 7,000) obtains its water supply from driven wells 48 to 60 feet deep. The system is owned by the city and was established in 1892 at a cost of $38,000. Cook deep well pumps with 300,000 gallons daily capacity are used. The daily consumption is 200,000 gallons.

For sanitary analysis see final table.

Paris, Edgar county (6,105, estimated 9,256) obtains its water supply from a creek one and three-fourths miles from business center. Plant is located on bank of the creek. Worthington triple expansion pumps of 2,500,000 gallons capacity are used. The system was established in 1895 at a cost of $150,000. The daily consumption is 870,000 gallons.

For sanitary analysis see following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF PARIS.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
								Ammonia.			
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
1891	Feb. 8, 1897	Distinct	.15	00	264.8	3.2	3.6	.06	.12	.01	2.9
1892	.do.	.do.	.15	00	270.8	3.1	3.7	.056	.128	.01.	2.9
8962	Jan. 23, 1901	Slight.	.05	Must.	257.2	3.6	5.7	.034	.178	.001	3.04
8984	Feb. 6, 1901	Distinct.	1.	00	263.6	3.2	3.4	.014	.094	.004	2.71
10172	Jan. 8, 1902	Decided.	Mud.	00	328.0	4.8	9.0	.752	.392	.01	.79
10228	Feb. 1, 1902	Slight.	000	00	321.6	5.0	8.4	.56	.304	.01	.83
10229	.do.	.do.	.05	00	254.8	4.7	7.0	.032	.344	.01	1.09

The analysis of the mineral content gave the following results:

LABORATORY NO. 10179, JAN. 17, 1902.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S. Gallon.
Potassium, K	5.4	Potassium nitrate	KNO_3	5.8	.34
Sodium, Na	28.9	Potassium chloride	KCl	5.8	.34
Magnesium, Mg	41.6	Sodium chloride	NaCl	69.8	4.07
Calcium, Ca	74.5	Sodium sulphate	Na_2SO_4	4.8	.28
Iron Fe	.9	Magnesium sulphate	$MgSO_4$	58.4	3.40
Aluminium, Al	.4	Magnesium carbonate	$MgCO_3$	102.1	5.95
Silica, SiO_2	2.8	Calcium carbonate	$CaCO_3$	188.2	10.98
Nitrate, NO_3	3.6	Iron carbonate	$FeCO_3$	1.9	.11
Chloride, Cl	62.	Alumina	Al_2O_3	.8	.05
Sulphate, SO_4	49.9	Silica	SiO_2	5.9	.34
			Total	443.5	25.86

Park Ridge, Cook county (1,340) obtains its water supply from two wells 1,503 and 1,450 feet deep. The system is owned by the village and was established in 1874.

Paxton, Ford county (3,036) obtains its water supply from wells 148 to 162 feet deep. The system is owned by the city. The pumps are of the Gould, triplex and Gould power head type. The pumping station, one tank and one reservoir are located in business part of the city. The daily consumption is about 50,000 gallons.

Pecatonica, Winnebago county (1,045) obtains its water supply from wells about 100 feet deep. The system is owned by the village and was established about 1888.

Pekin, Tazewell county (8,420) located on the Illinois river. The city water supply is obtained from wells 80 to 128 feet deep in the gravel beds of the Illinois river. These wells yield 3,000,000 gallons per day. Many manufacturies use water from Illinois river.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF PEKIN.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
143	Nov. 4, 1895	.....	.....	.....	336.4	9.	.2	.000	.008	.000	.8	.....
3184	Nov. 19, 1897	Clear.	.01	0 0	354.4	10.	.9	.003	.02	.003	6.6	.....
5047	Nov. 17, 1898	Slight.	.01	0 0	387.2	11.	.8	.000	.01	.000	6.	.....
5376	July. 10, 1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.8	.....
5423	Sept. 23, 1799	Very slight. . . .	.01	0 0	400.8	15.	1.1	.004	.012	.000	7.4	.....
10198	Jan. 23, 1902	Clear.	. 0	0 0	398.	24.0	1.7	.02	.054	.000	8.8	.....
14548	July 12, 1906	. .do.	. 0	0 0	418.	47.5	2.0	.046	.092	.000	1.36	262.
14668	July 26, 1906	None.	. 0	0	495.	45.0	1.35	.040	.040	Trace	5.6	261.7
14814	Aug. 20, 1906	. .do.	. 0	0	546.	47.5	1.95	.028	.052	.003	5.2	269.9

The analysis of the mineral content gave the following results:

LABORATORY NO. 14584, JULY 12, 1906.

Ions.	Parts per Million.	Hypothetical Combinations.		Parts per Million.	Grains per U. S. Gallon.
Potassium, K	2.5	Potassium nitrate,	KNO_3	6.5	.38
Sodium, Na	11.3	Sodium nitrate,	$NaNO_3$	2.7	.16
Ammonium, (NH_4)	.1	Sodium chloride,	NaCl	26.9	1.57
Magnesium, Mg	40.7	Ammonium chloride,	$(NH_4)Cl$	.3	.20
Calcium, Ca	75.1	Magnesium chloride,	$MgCl_2$	41.7	2.43
Iron, Fe	.4	Magnesium sulphate,	$MgSO_4$	82.1	4.79
Alumina, Al_2O_3	1.2	Magnesium carbonate,	$MgCO_3$	46.4	2.71
Nitrate, NO_3	6.0	Calcium carbonate,	$CaCO_3$	187.5	10.94
Chloride, Cl	47.5	Iron carbonate,	$FeCO_3$	.8	.50
Sulphate, SO_4	65.5	Alumina,	Al_2O_3	1.2	.07
Silica, SiO_2	16.5	Silica, SiO_2		16.5	.96
Bases,	3.5	Bases,		3.5	.20
		Total		416.1	24.28

Peoria, Peoria county (56,100, estimated 75,000) is situated on the Illinois river. The water supply is obtained from wells 34 to 59 feet deep in gravel. The system is owned by Peoria Water Works Company and was established in 1889. The Worthington vertical compound condensing high duty pumps with a daily capacity of 7,200,000 gallons are used. The daily consumption is 4,600,000.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSES OF THE MUNICIPAL WATER SUPPLY OF PEORIA. *

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.
		Turbidity.	Color.	Odor.				Free.	Albuminoid.		
329.	Dec. 27,1895	.....	.....	.....	1298.8	96.5	.95	.012	.066	.01	18.
330.	Dec. 27,1895	.....	.....	.....	1949.6	318.	1.3	.003	.152	Tr'ce	40.
361.	Jan. 7,1896	.....	.....	.....	364.8	24.	1.1	.003	.06	.002	3.4
362.	Jan. 7,1896	.....	.....	.....	350.0	11.	2.9	.054	.092	.12	4.32
2400.	July 2,1897	V. slight	.02	000	457.2	35.	2.1	.001	.042	.000	2.4
8417.	July 10,1900	do	.04	Mus.	441.6	36.	5.9	.018	.120	.001	.76
10292.	Mar. 3,1902	Decided	Yellow...	000	452.4	33.	3.	.88	.03	.000	.07
10315.	Mar. 17,1902	Distinct	do.	000	457.2	33.5	3.3	.72	.04	.000	.04
10320.	Mar. 18,1902	Clear.	.00	000	381.2	3.4	1.6	.002	.016	.000	2.
10379.	May 3,1902	Distinct	Yellow...	000	442.0	33.5	2.3	.72	.022	.001	.1
10380.	May 5,1902	Clear.	.000	000	1475.6	212.2	2.5	1.20	.006	.002	.1
10386.	May 6.1902	Decided.	Yellow...	000	455.2	31.	2.2	.64	.036	.003	.037
10390.	May 9,1902	Distinct.	do.	000	461.2	31.5	2.2	.688	.064	.....	.....
10396.	May 14,1902	do	do.	000	451.2	33.5	1.9	.800	.022	.000	.11
10508.	July 17,1902	V. slight.	.00	000	293.2	7.8	3.1	.01	.07	.001	.88
10509.	July 17,1902	Clear.	.00	000	200.8	8.4	3.6	.010	.068	.000	.56
10536.	Aug. 17,1902	do	.00	000	324.8	9.47	4.3	.028	.148	.000	.68
10852.	Jan. 13,1903	Distinct.	.20	000	442.0	26.	1.3	.....	.042	.000	.16
10886.	Feb. 6,1903	Clear.	.00	000	429.6	25.	1.6	.96	.064	.001	.24
11095.	May 21,1903	Decided.	Yellow...	000	724.0	.....	6.3	.68	.040	.000	.08
11480.	Oct. 19,1903	do	.....	.....	.....	30.1	3.1	.006	.082	.000	1.0
11481.	Oct. 19,1903	do	.....	.....	.....	29.75	3.4	.016	.098	.000	.96
11482.	Oct. 19,1903	.....	.....	.....	.....	29.55	3.3	.008	.090	.000	1.00
11483.	Oct. 19.1903	.....	.....	.....	.....	29.5	3.1	.014	.100	.001	1.00
11484.	Oct. 19,1903	.....	.....	.....	.....	29.5	3.4	.016	.074	.001	1.08
11485.	Oct. 19,1903	.....	.....	.....	.....	23.3	2.8	.010	.084	.001	.72
11487.	Oct. 19.1903	Slight.	.000	000	466.8	13.6	3.3	.010	.064	.000	.12
11497.	Oct. 21,1903	V. slight.	.000	000	420.8	28.6	3.2	.010	.082	.000	1.20
11498.	Oct. 21,1903	do.	.000	000	416	28.7	3.3	.026	.082	.000	1.08
11499.	Oct. 21,1903	do.	.000	000	423.6	28.8	2.9	.018	.066	.000	1.04
12164.	June 17,1904	Slight.	.00	Pecu.	1592.0	2.97	3.2	.012	.024	.65	.19
12433.	Sept. 13,1904	Distinct.	Yellow...	00	.....	22.25	1.6	1.20	.070	.000	.080
12434.	Sept. 13,1904	Clear.	.0	00	.....	22.	1.5	.92	.038	.034	.086

For mineral analysis see also Averyville.

The analysis of the mineral content gave the following results:

LABORATORY NO. 10509, JULY 17, 1902.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	10,509			10,509	10,509
Potassium, K	4.0	Potassium nitrate,	KNO_3	4.1	.24
Sodium, Na	22.9	Potassium chloride,	KCl	4.6	.27
Magnesium, Mg	24.9	Sodium chloride,	NaCl	10.2	.59
Calcium, Ca	64.0	Sodium sulphate,	Na_2SO_4	58.2	3.39
Iron, Fe	1.5	Magnesium sulphate,	$MgSO_4$	1.8	.10
Alumina, Al_2O_3	.7	Magnesium carbonate,	$MgCO_3$	85.3	4.98
Silicon, Si	5.0	Calcium carbonate,	$CaCO_3$	160.0	9.33
Nitrate, NO_3	.2	Iron carbonate,	$FeCO_3$	3.2	.19
Chloride, Cl	8.4	Alumina,	Al_2O_3	1.4	.08
Sulphate, SO_4	40.7	Silica,	SiO_2	10.6	.61
		Total		339.4	19.78

*Includes analyses of test wells

Peotone, Will county, (1,003 estimated 1,200), obtains its water supply from artesian wells, 1,368 feet deep. The pumping plant is located in the center of the town.

For sanitary analysis see final table.

The analysis of the mineral content gave the following results:

LABORATORY NO. 8871, DEC. 6, 1900; NO. 14203, APRIL 14, 1906.

Ions.	Parts Per Million.		Hypothetical Combinations.	Parts Per Million.		Grains Per U. S. Gallon.	
	8,871	14,203		8,871	14,203	8,871	14,203
Potassium, K	8.3	5.0	Potassium nitrate, KNO_3	1.1	1.5	.06	.09
Sodium, Na	30.7	34.5	Potassium chloride, KCl	3.6	8.3	.21	.48
Ammonium (NH_4)	.27	.7	Potassium sulphate K_2SO_4	13.5	.....	.78	.....
Magnesium, Mg	37.4	33.8	Sodium sulphate, $NaSO_4$	94.8	106.4	5.50	6.20
Calcium, Ca	158.2	85.1	Ammonium sulphate$(NH_4)_2SO_4$	.....	2.6	.....	.15
Ferrous, Fe	.....	1.6	Ammonium carbonate$(NH_4)_2CO_3$	.7	.....	.04	.....
Aluminium, Al	2.2	6.8	Magnesium sulphate, $MgSO_4$	141.4	110.7	9.20	6.46
Silicon, Si	2.	16.1	Magnesium carbonate $MgCO_3$	31.5	39.5	1.82	2.30
Nitrate, NO_3	.7	.9	Calcium carbonate, $CaCO_3$	395.3	212.4	22.93	12.39
Chloride, Cl	1.7	4.0	Ferrous carbonate, $FeCO_3$	.....	3.3	.....	.19
Sulphate, SO_4	196.3	162.1	Alumina, Al_2O_3	.....	6.8	.....	.40
Bases	.....	1.9	Aluminium sulphate $Al_2(SO_4)_2$	13.9	.....	.80	.....
			Silica, SiO_2	4.2	16.1	.24	.94
			Bases	.....	1.9	.....	.11
			Total	700.0	509.5	41.58	29.71

Peru, LaSalle county, (6,863 estimated 7,890), is situated on the Illinois river. The water supply is obtained from three wells 1,365 feet deep. The system is owned by the city of Peru, and was installed at a cost of $75,000.

For sanitary analysis see final table.

Petersburg, Menard county (2,807) has sent no report. According to Leverett.*

The city water supply is obtained from wells 35 to 60 feet deep.

Pinckneyville, Perry county (2,357) is located on Breeze lake. The water supply is obtained from a well 2,000 feet deep. The system is owned by the city and was established in 1894.

Pittsfield, Pike county (2,293) obtains its water supply from wells 25 to 100 feet deep. The system is owned by the city.

Plano, Kendall county (1,634 estimated 2,000) is situated on Big Rock river. The city supply is obtained from a large spring, 14 feet deep and 10 feet in diameter in Silurian strata. The system is owned by the city and was established in 1891 at a cost of $20,000. Blake Duplex pumps with a capacity of 320 gallons per minute are used.

The daily consumption is 110,000 gallons.

Polo, Ogle county (1,869) obtains its water supply from wells 2,200 and 1,200 feet deep. The system is owned by the city and was established in 1891.

For sanitary analysis see final table.

*Leverett page 709, Monograph XXXVIII U. S. Geol. Survey.

The analysis of the mineral contents gave the following results:

LABORATORY NO. 10188, JAN. 17, 1902.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	1.5	Potassium nitrate	KNO_3	.6	04
Sodium, Na	7.1	Potassium chloride	KCl	4.2	.25
Magnesium, Mg	40.3	Potassium sulphate	K_2SO_4	3.5	.20
Calcium, Ca	69.3	Sodium sulphate	Na_2SO_4	22.0	1.28
Iron Fe	.4	Magnesium sulphate	$MgSO_4$	8.6	.50
Aluminium, Al	5.8	Magnesium carbonate	$MgCO_3$	134.4	7.84
Silicon, Si	4.3	Calcium carbonate	$CaCO_3$	173.2	10.11
Nitrate, NO_3	.3	Iron carbonate	$FeCO_3$	.8	.05
Chloride, Cl	2.0	Alumina	Al_2O_3	10.9	.63
Sulphate, SO_4	23.5	Silica	SiO_2	9.1	.53
			Total	367.3	21.43

Pontiac, Livingston county, (4,266 estimated 6,000) is located on Vermillion river, from which it obtains its water supply. The system is owned by the Pontiac Light & Power Company, and was established in 1891. One Gould pump and one Gordon, Ladle & Dunnes pump are used with a daily capacity of 2,000,000 gallons. The daily consumption is from 400,000 to 700,000 gallans. The water is filtered by Jewell filters, using as a coagulant lime and sulphate of iron.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF PONTIAC.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogenas			
								Ammonia			
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.
694	Sept. 9, 1896	.....	.....	.....	346.8	3.4	3.6	.006	.11	.040	5.
2671	Sept. 13, 1897	Very slight	.02	00	1110.8	25.0	3.5	.020	.14	.011	14.
2711	Sept. 24, 1897	Distinct	.1	00	335.2	5.	5.8	.022	.24	.02	.8
2932	Nov. 11, 1897	..do.	.15	00	322.8	4.	5.4	.001	.162	.000	.1
2944	Nov. 13, 1897	..do.	.15	00	318.4	4.1	6.1	.018	.18	.000	.8
2953	Nov. 15, 1897	..do.	.07	00	314.0	3.7	4.7	.01	.208	.000	.9
3402	Nov. 29, 1897	Very decided	Mud	00	556.8	1.0	28.4	.056	1.12	.032	1.4
5756	Jan. 30, 1899	..do.	..do.	00	611.6	5.	18.0	.036	.64	.005	.44
7551	Jan. 16, 1900	Distinct	.05	00	731.	21.9	3.1	.72	.16	.05	5.
11159	June 24, 1903	..do.	.1	00	416.	2.4	3.4	.016	.096	.000	2.96
11160	..do.	..do.	.1	000	351.6	2.57	4.3	.016	.128	.000	3.2
11180	July 8, 1903	Decided	Mud	00	545.2	3.4	10.1	.036	.320	.000	1.52
11181	..do.	..do.	..do.	00	394.	3.4	5.6	.1	.224	.009	1.47
11208	July 20, 1903	..do.	..do.	Dec'y	411.2	2.8	16.2	.044	.000	.000	2.48
11209	..do.	..do.	..do.	..do..	573.2	3.2	14.9	.052	.060	.012	2.38
11269	Aug. 11, 1903	Clear	.100	00	326.0	2.8	4.8	.048	.056	.000	1.8
11424	Oct. 1, 1903	Decided	Red	00	354.4	5.73	4.7	.032	.112	.000	.32
11425	..do.	Distinct	.1	00	343.6	5.6	4.6	0.16	.160	.000	.48
12107	June 2, 1904	.....	.....	.....	370.4	2.4	4.5	.112	.224	.000	4.20
12108	..do.	.....	.....	.....	311.6	2.6	2.9	.028	.096	.001	4.0

Princeton, Bureau county (4,023) obtains its city supply from wells about 2,500 feet deep.

Prophetstown, Whiteside county (1,143), is located on Rock river. The city water supply is obtained from wells. The system was established in 1905, at a cost of $16,000 and is owned by the city.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

Ions	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	2.2	Potassium nitrate,	KNO_3	5.7	.33
Sodium, Na	7.6	Sodium nitrate	$NaNO_3$	8.5	.50
Ammonium, NH_4	.1	Sodium chloride,	NaCl	13.2	.77
Magnesium, Mg	22.6	Sodium sulphate,	Na_2SO_4	.3	.02
Calcium, Ca	78.5	Ammonium sulphate,	$(NH_4)_2SO_4$	.4	.02
Iron Fe	1.0	Magnesium sulphate,	$MgSO_4$	60.8	3.55
Nitrate, NO_3	9.7	Magnesium carbonate,	$MgCO_3$	35.7	2.08
Chloride, Cl	8.0	Calcium carbonate,	$CaCO_3$	195.9	11.43
Sulphate, SO_4	49.0	Iron carbonate,	$FeCO_3$	2.1	.12
Alumina, Al_2O_3	.8	Alumina,	Al_2O_3	.8	.05
Silica, SiO_2	15.8	Silica	SiO_2	15.8	.92
		Total..		339.2	19.78

Pullman, Cook county (8,500) obtains water from the Chicago water system (Lake Michigan).

Quincy, Adams county (36,252 estimated 40,000) is situated on the Mississippi river from which it obtains its water supply. The system is owned by a private company. The water is treated with iron sulphate and lime. There are three Worthington pumps of 3,500,000, 3,000,000 and 7,'500,000 gallons capacity respectively, and a Gordon & Maxwell of 5,500,000 gallons capacity.

The average daily consumption is 1,411,534 gallons.

For sanitary analysis see the following table:

SANITARY EXAMINATION OF RAW MISSISSIPPI RIAER WATER—CITIZENS' WATER WORKS CO., QUINCY, ILLINOIS, 1905-1906

Serial number	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.			
								Ammonia.									
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.	.01 c. c.
12827	Jan. 9, 1905	.....	.....	.....	199.2	3.7	9.60	.06	.24	.002	.360	.....	.....	.....	.....	.....	.....
12921	Feb. 21, 1905	.....	.....	.....	210.4	3.2	7.2	.108	.128	.002	.640	.....	.....	.....	.....	.....	.....
13001	Mar. 20, 1905	.....	.....	.....	290.	2.85	11.6	.300	.352	.005	.720	.....	.....	.....	.....	.....	.....
13105	April 24, 1905	.....	.....	.....	232.4	2.55	14.40	.156	.432	.004	.360	.....	.....	.....	.....	.....	.....
13214	June 5, 1905	.....	.....	.....	238.4	1.8	14.0	.104	.288	.006	.200	.....	.....	.....	.....	.....	.....
13372	July 24, 1905	.....	.....	.....	242.0	1.75	15.9	.092	.352	.000	.240	.....	.....	.....	.....	.....	.....
*13374	..do.	.....	.....	.....	133.6	2.05	8.35	.052	.188	.000	.240	.....	.....	.....	.....	.....	.....
13521	Sept. 11, 1905	.....	.....	.....	351.	1.5	11.0	.076	.432	.007	.353	.....	.....	.....	.....	.....	.....
13659	Oct. 9, 1905	.....	.....	.....	245.	1.7	16.15	.048	.432	.000	.160	.....	19300	1 +	2 +	2 +	.....
13718	Nov. 6, 1905	V. Decided.	.3	.00	314.	2.35	17.6	.088	.118	.010	.20	.....	15350	1 ?	2 +	2—	1+1—
13796	Dec. 4, 1905	Decided. . . .	.8	2Veg.	270.	1.01	16.35	.060	.432	.000	.20	127.4	21000	.....	1 +	1 +	.....
															1—	1—	2—
13887	Jan. 2, 1906	..do.....	.4	Earthy	225.	1.5	11.25	.112	.352	.002	.280	137.8	14300	1—	1 +	.....	.....
															1—		
13993	Feb. 12, 1906	..do.....	.4	Earthy	231.	1.5	10.2	.160	.256	.003	.560	168.8	1710	1 +	2—	1 +	.....
																1—	
14078	Mar. 5, 1906	..do.....	Muddy.	.00	586.	2.5	15.5	.240	.800	.008	.554	105.8	17700	1—	2 +	2 +	.....
14172	April 2, 1906	Muddy.....	..do....	2Earthy	1684.	2.05	41.1	.216	2.160	.020	.660	100.8	2290	1—	2—	2—	.....
14271	April 30, 1906	V. Decided.	.1	.00	179.	1.5	15.1	.088	.080	.000	.12	80.0	2100	1—	1—	2—	.....
															1 +		
14481	June 4, 1906	..do.....	Muddy.	4Earthy	864.0	2.5	24.9	.176	1.400	.018	.542	116.4	12100	1 +	2 +	2 +	.....
14573	July 2, 1906	..do.....	3	Musty	502.	3.5	18.0	.072	.800	.001	.36	124.1	1300	1 +	2 +	2 +	.....
14784	Aug. 13, 1906	..do.....	Muddy.	.00	971.	2.0	24.35	.112	1.00	.000	.56	108.6	42400	1 +	2 +	2 +	.....
14905	Sept. 4, 1906	Decided....	.2	.00	457.	3.0	14.5	.048	.672	.000	.24	140.2	23500	1 +	2 +	2 +	.....
15266	Oct. 29, 1906	V. Decided.	.6	.00	294.	1.0	3.85	.072	.312	.002	.240	147.8	1300	1—	2—	1 +	.....
																1—	
15419	Dec. 3, 1906	Decided. . . .	Muddy.	.00	296.	2.	13.25	.064	.376	.000	.520	142.1	7200	1 +	2 +	.....	.....

*Excelsior Stove & Mfg. Co.—Mississippi River.

ANALYSES OF WATER FROM MISSIISSIPPI RIVER—CLEAR WELL TAP—CITIZENS' WATER WORKS. 1905-1906.

Serial number.	Date of collection.	Appearnce.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.			
								Ammonia.									
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.	0.01 c. c.
12828	Jan. 9, 1905	.....	.....	.....	124.4	3.45	5.40	.056	.080	.000	.360	.....	.....	.....	.....	.....	.....
12922	Feb. 21, 1905	.....	.....	.....	120.	3.5	3.85	.108	.096	.005	.680	.....	.....	.....	.....	.....	.....
13002	Mar. 20, 1905	.....	.....	.....	113.2	2.85	5.00	.308	.216	.008	.720	.....	.....	.....	.....	.....	.....
13094	April 20, 1905	.....	.....	.....	104.4	2.1	6.15	.054	.128	.000	.160	.....	.....	.....	.....	.....	.....
*14095	..do.	.....	.....	.....	99.8	2.4	5.15	.056	.088	.003	.360	.....	.....	.....	.....	.....	.....
13106	April 24, 1905	.....	.....	.....	118.0	2.15	6.75	.060	.176	.003	.160	.....	.....	.....	.....	.....	.....
13215	June 5, 1905	.....	.....	.....	116.8	1.9	6.95	.072	.160	.002	.280	.....	.....	.....	.....	.....	.....
13373	July 24, 1905	.....	.....	.....	134.	1.7	9.65	.052	.220	.000	.240	.....	.....	.....	.....	.....	.....
13522	Sept. 11,1905	.....	.....	.....	156.	2.4	4.9	.104	.224	.000	.400	.....	.....	.....	.....	.....	.....
13719	Nov. 6, 1905	None.....	.3	.0	127.	1.9	10.1	.044	.080	.000	.200	.....	56	1—	2—	2—	2—
13797	Dec. 4, 1905	Clear.....	.0	.0	150.	1.5	7.55	.068	.224	.000	.200	100.0	318	.....	1—	.....	.....
															1?		
13888	Jan. 2, 1906	Slight.....	.0	Earthy	169.	1.5	5.6	.112	.192	.001	.360	100.4	1576	.....	.....	.....	.....
13994	Feb. 12, 1906	..do.....	.0	.0	140.	1.5	5.4	.128	.152	.002	.760	181.4	80	1—	2—	2—	.....
14079	Mar. 5, 1906	Clear.....	.2	.0	142.	1.5	7.1	.088	.416	.060	.520	53.0	925	1—	2—	2—	.....
14173	April 2, 1906	..do.....	.1	3Musty	186.	1.95	5.6	.200	.248	.024	.536	66.6	460	1—	2—	2—	.....
14272	April 30, 1906	None.....	.2	.0	109.	2.0	8.3	.064	.176	.000	.120	48.0	40	1—	2—	2—	.....
14482	June 4, 1906	Clear.....	.1	2Earthy	191.	3.0	7.35	.128	.200	.006	.714	89.2	3200	1 +	1 +	2—	.....
															1—		
14574	July 2, 1906	..do.....	.2	.0	144.	2.5	7.6	.040	.200	.000	.400	77.6	500000	1 +	2—	2 +	.....
14785	Aug. 13, 1906	..do.....	.1	Earthy	158.	1.5	4.9	.016	.136	.000	1.120	77.6	30	1 +	1—	2—	.....
															1 +		
14906	Sept. 4, 1906	..do.....	.1	.0	151.	3.0	5.2	.032	.152	.000	.240	84.5	125	1 +	2 +	2—	.....
*15242	Oct. 26, 1906	..do.....	.1	4Musty	184.	2.0	6.7	.048	.184	.001	.320	105.6	.....	.....	.....	.....	.....
15243	..do.....	..do.....	.1	.0	172.	2.0	6.8	.032	.176	.000	.240	105.6	.....	.....	.....	.....	.....
15265	Oct. 29, 1906	..do.....	.1	.0	172.	2.0	5.85	.024	.136	.002	.280	78.7	11	1—	2—	2—	.....
15420	Dec. 3, 1906	..do.....	.2	.0	171.	3.0	6.75	.056	.088	.002	.480	96.0	520	1 ?	1 +	1—1+	1—
*15421	..do.....	.....	.0	.0	153.	4.0	7.2	.056	.144	.002	.320	96.2	.....	.....	.....	.....	.....

* Water from reservoir.

Analysis of the mineral content gave the following results:

Ions.	Parts Per Million. Unfiltered.	Filtered.	Hypothetical Combinations.		Parts Per Million. Unfil.	Fil.	Grains Per U. S Gallon. Unfil.	Fil.
Laboratory number	14078	14079			14078	14079	14078	14079
Date	Mar. 23,1906.	Mar. 23,1906.						
Potassium, K	2.7	2.7	Potassium nitrate,	KNO_3	3.9	4.9	.23	.29
Sodium, Na	5.8	4.3	Potassium chloride,	KCl	2.3	1.5	.13	.09
Magnesium, Mg	10.7	9.3	Sodium chloride,	NaCl	2.3	1.3	.13	.08
Calcium, Ca	30.	18.4	Sodium sulphate,	Na_2SO_4	15.1	11.7	.88	.68
Iron, Fe	1.2	.7	Magnesium sulphate,	$MgSO_4$	8.3	30.5	.48	1.78
Alumina, Al_2O_3	5.1	1.2	Magnesium carbonate,	$MgCO_3$	31.2	11.1	1.82	.05
Nitrate, NO_3	2.4	3.0	Calcium carbonate,	$CaCO_3$	74.9	45.9	4.37	2.08
Chloride, Cl	2.5	1.5	Iron carbonate,	$FeCO_3$	2.5	1.5	.15	.09
Sulphate, SO_4	16.8	32.3	Alumina,	Al_2O_3	5.1	1.2	.30	.07
Silica, SiO_2	16.9	6.5	Silica,	SiO_2	16.9	6.5	.99	.38
Sus. Matter	422.5	.0			.....	.....	.....	.....
			Total		162.5	116.1	9.48	6.79

ANALYSES OF WATER FROM MISSISSIPPI RIVER AT QUINCY, ILLINOIS, AUGUST 1st TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica, SiO_2	Iron Fe.	Aluminium, Al	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium. Na.	Bi-Carbonate HCO_3	Sulphate, SO_4	Chlorine, Cl.	Nitrate, NO_3
3101	Aug	1-10	150	104	224	17	.1	....	38	17	16	180	25	5.5	1.0
3102	..do	11-20	540	287	192	23	.2	....	34	14	16	161	23	5.	2.1
3103	..do	21-30	360	190	197	21	2.	....	36	17	18	166	23	5.5	2.
3104	..do	21- 9	270	187	213	16	.2	....	36	19	22	161	25	5.	2.7
3105	Sept	10-18	245	168	187	17	.5	....	31	13	10	168	24	3.5	2.8
3106	..do	20-29	224	149	196	16	.4	....	35	18	11	156	21	9.0	1.8
3107	..do	30- 9	263	169	200	17	.12	....	38	21	12	162	22	4.5	2.0
3108	Oct	10-18	144	76	213	19	.02	....	38	21	11	190	20	6.0	1.5
3109	..do	20-31	151	86	220	15	.04	....	42	19	12	206	22	6.5	1.0
3110	..do	31- 8	50	41	223	19	.04	....	41	19	14	214	26	4.3	.5
3111	Nov	9-19	30	41	185	17	.03	....	35	16	8	174	14	7.5	.3
3112	..do	20-30	30	27	196	16	.05	....	36	17	11	182	27	3.8	2.5
3113	Dec	1-10	50	54	217	17	.32	....	37	19	11	188	29	6.2	2.5
3114	..do	11-20	25	24	190	10	.11	....	35	18	13	176	27	4.5	2.
3115	..do	21-25	10	24	244	18	.28	....	37	24	16	225	39	6.0	2.0
Average	.....	.....	170	109	207	17	.29	....	37	18	13	181	25	5.5	1.8

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	2.5	.15
Sodium chloride,	NaCl	9.1	.53
Sodium sulphate,	Na_2SO_4	26.8	1.56
Magnesium sulphate,	$MgSO_4$	22.7	1.32
Magnesium carbonate,	$MgCO_3$	46.4	2.70
Calcium carbonate,	$CaCO_3$	92.3	5.38
Iron carbonate,	$FeCO_3$	.6	.03
Alumina,	Al_2O_3	.....	.....
Silica,	SiO_2	17.0	.99
Total		217.4	12.66

Rantoul, Champaign county (1,207) obtains its water supply from wells. The system is owned by the city and was established about 1895.

For sanitary analysis see final table.

The analysis of the mineral content gave the following results:

LABORATORY NO. 3430, APRIL 5, 1898.

Ions.	Parts Per Million.	Hypothetical Combinations		Parts Per Million.	Grains Per U. S. Gallon.
	3,430			3,430	3,430
Potassium, K	3.4	Potassium nitrate,	KNO_3	2.5	.15
Sodium, Na	16.8	Potassium chloride,	KCl	1.5	.08
Ammonium. (NH_4)	.63	Potassium sulphate,	K_2SO_4	3.7	.31
Magnesium, Mg	32.6	Sodium sulphate,	Na_2SO_4	1.0	.06
Calcium. Ca	67.9	Sodium carbonate,	Na_2CO_3	38.	2.21
Iron, Fe	5.9	Ammonium carbonate.	$(NH_4)_2CO_3$	1.8	.10
Alumina, Al_2O_3	1.2	Magnesium carbonate.	$MgCO_3$	112.4	6.55
Silica, SiO_2	6.7	Calcium carbonate,	$CaCO_3$	167.9	9.78
Nitrate, NO_3	1.5	Iron carbonate,	$FeCO_3$	12.3	.71
Chloride. Cl	.7	Alumina	Al_2O_3	2.3	.12
Sulphate, SO_4	2.7	Silica,	SiO_2	14.2	.83
		Total		357.6	20.80

Redbud, Randolph county (1,169) has no general water supply.

Ridgely, Sangamon county (1,169) is a part of the city of Springfield.

River Forest, Cook county (1,539 estimated 2,300) is situated on the Desplaines river. The water supply is obtained from artesian wells 1,000 feet deep. The system is owned by the village and was established at a cost of $8,500. Blake Ingersoll air compressor pumps are used. The daily consumption is 120,000 gallons.

Riverside, Cook county (1,551) is situated on Desplaines river. The water supply is obtained from two artesian wells 1,000 and 2,000 feet deep respectively. The system is owned by the village and was established in 1895. The daily consumption is 300,000 gallons. One reservoir of 500,000 gallons is included in the system.

For sanitary analysis see final table.

Analysis of the mineral content gave the following results:

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
Laboratory No.	10689	10691			10689	10691	10689	10691
	October 8, 1902.							
Potassium, K	4.8	20.6	Potassium nitrite	KNO_2	.7	.9	.04	.05
Sodium, Na	28.1	200.6	Potassium nitrate,	KNO_3	.4	1.3	.02	.08
Ammonium, NH_4	.2	.3	Potassium chloride,	KCl	8.2	37.6	.48	2.20
Magnesium, Mg	62.1	20.2	Sodium chloride,	NaCl	42.7	336.8	2.49	19.65
Calcium, Ca	117.9	62.7	Sodium sulphate,	Na_2SO_4	35.0	130.3	2.04	7.60
Iron Fe,	1.5	.5	Sodium carbonate,	Na_2CO_3	.....	59.7	.....	3.48
Aluminium, Al	3.3	2.0	Ammonium sulphate,	$(NH_4)_2SO_4$	.7	.....	.04	.....
Silica, SiO_2	6.1	3.6	Ammonium carbonate,	$(NH_4)_2CO_3$	.....	.8	.....	.05
Nitrate, NO_3	.3	.5	Magnesium sulphate,	$MgSO_4$	228.5	.....	13.33	.....
Chloride, Cl	29.8	222.	Magnesium carbonate,	$MgCO_3$	55.9	70.1	3.26	4.09
Sulphate, SO_4	206.8	88.	Calcium carbonate,	$CaCO_3$	294.6	156.8	17.19	9.15
			Iron carbonate,	$FeCO_3$	3.2	1.0	.19	.05
			Alumina,	Al_2O_3	6.2	3.8	.36	.24
			Silica,	SiO_2	13.	7.6	.76	.44
			Total		689.1	806.7	40.20	47.06

Riverton, Sangamon county (1,511), has no general water supply.

Robinson, Crawford county (1,683 estimated 2,200) is situated on a creek. The water supply is obtained from wells from 80 to 100 feet deep. The system is owned by Robinson Water, Light & Heat Company. A reservoir and tank are located two blocks from business center of the city.

Rochelle, Ogle county (2,073) obtains its water supply from an artesian well, 1,896 feet deep. The system is owned by the city.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 11743, JANUARY 12, 1904.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	11.743			11,743	11,743
Potassium, K	1.7	Potassium nitrate,	KNO_3	2.3	.13
Sadium, Na	7.8	Potassium chloride,	KCl	1.7	.10
Ammonium, NH_4	.096	Sodium chloride,	NaCl	2.3	.13
Magnesium, Mg	24.7	Sodium sulphate,	Na_2SO_4	21.3	1.24
Calcium, Ca	81.1	Magnesium sulphate,	$MgSO_4$	1.1	.06
Iron, Fe	3.2	Magnesium carbonate,	$MgCO_3$	85.2	2.97
Alumina, Al_2O_3	1.7	Calcium carbonate,	$CaCO_3$	203.7	11.88
Silica, SiO_2	5.2	Iron carbonate,	$FeCO_3$	4.1	.24
Nitrate, NO_3	1.4	Alumina,	Al_2O_3	3.2	.19
Chloride, Cl	2.2	Silica,	SiO_2	12.7	.74
Sulphate, SO_4	15.2				
		Total		337.6	19.69

Rock Falls, Whiteside county (2,176) is located on Rock river. The water supply is furnished by the Sterling Water Co. See Sterling.

Rockford, Winnebago county (31,051) is situated on the Rock river. It obtains its water supply from wells 1,300 and 2,200 feet deep. The water is raised to the surface by centrifugal pumps. System is owned by the city.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF ROCKFORD.

Serial number.	Date of collection.	Apperance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
		Turbidity.	Color.	Odor.				Ammonia. Free.	Ammonia. Albuminoid.	Nitrites.	Nitrates.	
223	Nov . 25, 1895	.....	.....	.....	304.8	.....	.....	.....	.....	.....	.....	.....
224	..do.	.....	.....	.....	145.4	.....	.....	.....	.....	.....	.....	.....
566	Mar. 10, 1896	.....	.....	.....	294.8	2.4	.6	.03	.023	.000	.1	.....
652	April 1, 1896	.....	.....	.....	290.	2.3	.35	.006	.006	.000	.16	.....
653	April 1, 1896	.....	.....	.....	292.4	2.5	.40	.006	.005	.000	.12	.....
736	April 17, 1896	.....	.....	.....	382.8	13.	.5	.000	.019	.000	3.2	.....
776	April 27, 1896	.....	.....	.....	296.	2.7	.4	.000	.002	.000	.05	.....
833	May 12, 1896	.....	.....	.....	1066.	75.	1.25	.....	.....	.007	32.	.....
842	..do.	.....	.....	.....	301.6	3.	.5	.012	.014	.000	.3	.....
860	May 18, 1896	.....	.....	.....	302.	2.8	.8	.008	.016	.000	.15	.....
862	..do.	.....	.....	.....	309.2	2.7	.35	.001	.01	.000	.15	.....
902	May 26, 1896	Decided	.2	00	294.8	2.7	.6	.012	.060	.000	.1	.....
903	..do.	Slight	.01	00	442.8	24.	.7	.002	.052	.000	18.	.....
904	..do.	None	.00	00	292.	3.	.75	.001	.022	.000	.3	.....
1001	June 17, 1896	..do	.00	00	294.	3.3	.8	.002	.01	.000	.2	.....
2887	Nov. 3, 1897	Very slight ...	.02	00	289.2	3.2	2.	.001	.014	.000	.9	.....
3564	May 12, 1898	..do	.02	00	335.2	7.	1.1	.004	.012	.000	.6	.....
3566	..do.	..do	.02	00	432.8	10.	2.1	.062	.058	.007	.6	.....
4533	Dec. 26, 1898	..do	.02	00	290.4	6.	1.	.006	.01	.000	.2	.....
5105	May 27, 1899	..do	.01	00	297.6	4.4	.7	.001	.01	.000	.16	.....
5106	..do.	..do	.01	00	275.6	13.45	.8	.000	.026	.000	.2	.....
8869	Dec. 5, 1900	..do	.01	00	283.6	3.	1.1	.032	.024	T'ace	.12	.....
9388	Sept. 16, 1901	Clear	.00	00	298.4	2.	1.1	.02	.018	.000	.2	.....
11631	Nov. 24, 1903	Distinct	.00	000	298.4	3.2	1.5	.008	.012	.000	.16	.....
11632	..do.	Very slight ...	.00	000	345.6	11.	1.6	.048	.026	.001	8.0	.....
11633	..do.	..do	.00	000	291.2	3.4	1.5	.016	.012	.001	.20	.....
12745	Jan. 14, 1904	Decided	Mud.	Must	354.0	3.2	4.3	.080	.064	.012	1.628	.....
13670	Jan. 18, 1905	Slight	.00	000	320.	.75	1.0	.024	.032	.000	.12	.....
13748	Nov. 13, 1905	Clear	.00	000	267.	4.0	1.1	.012	.022	.000	.20	282.2
14176	April 2, 1906	..do	.10	000	311.	4.0	.9	.036	.066	.000	.200	281.2

An analysis of the mineral content gave the following results:

LABORATORY No. 8971, JANUARY 22, 1901.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
	8,971			8,971	8,971
Potassium, K	2.5	Potassium nitrate,	KNO_3	6.4	.37
Sodium, Na	43.2	Sodium nitrate,	$NaNO_3$	13.7	.80
Magnesium, Mg	17.3	Sodium chloride,	NaCl	16.5	.96
Calcium, Ca	46.2	Sodium sulphate,	Na_2SO_4	28.4	1.65
Ferrous, Fe	1.9	Sodium carbonate,	Na_2CO_3	54.9	3.20
Aluminium, Al_2O_3	7.4	Magnesium carbonate,	$MgCO_3$	60.1	3.51
Silica, SiO_2	15.1	Calcium carbonate,	$CaCO_3$	115.4	6.74
Nitrate, NO_3	13.9	Alumina,	Al_2O_3	14.0	.83
Chloride, Cl	10.0	Silica,	SiO_2	32.8	1.92
Sulphate, SO_4	19.2	Ferrous carbonate,	$FeCO_3$	3.9	.23
		Total		346.1	20.20

Rock Island, Rock Island county. (19,493) is situated on the Mississippi river. The water supply is obtained from the river. The water is pumped to gravity filters on the bluffs and is distributed by gravity throughout the greater part of the city. The higher portion of the city is supplied by an auxiliary pump and a stand tower. The system is owned by the city.

For sanitary analysis see the following table:

SANITARY ANALYSES OF WATER TAKEN FROM MISSISSIPPI RIVER AT ROCK ISLAND—RAW—CITY SUPPLY.

Serial number.	Date of collection.	APPEARANCE.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	NITROGEN AS				Alkalinity.	Bacteria per c. c.	COLON BACILLUS.		
		Turbidity.	Color.	Odor.				AMMONIA.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 cc.
								Free.	Albuminoid.							
1148	July 20, 1896	.....	.....	.....	204.0	1.7	12.4	.160	.400	.001	.30	.....	.....	.....	.....	.....
1149	..do.....	.....	.....	.....	203.6	1.6	12.6	.044	.400	.000	.20	.....	.....	.....	.....	.....
2807	Oct. 15, 1897	Distinct....	Muddy.	.00	222.4	2.0	12.2	.076	.360	.030	.25	.....	.....	.....	.....	.....
2899	Nov. 5, 1897	Decided.....	..do....	.00	199.2	1.8	13.6	.120	.400	.002	.30	.....	.....	.....	.....	.....
3589	May 16, 1898	Distinct....	.5	.00	213.6	1 7	13.1	.094	.44	.000	.40	.....	.....	.....	.....	.....
3606	May 21, 1898	..do.....	.5	.00	224.4	1.8	12.7	.116	.400	.008	.25	.....	.....	.....	.....	.....
7371	April 18, 1900	Decided.....	Muddy.	.00	222.4	1.6	12.7	.056	.296	.008	.32	.....	.....	.....	.....	.....
9012	Feb. 23, 1901	Slight.....	.3	.00	168.4	2.8	9.0	.092	.224	.003	.477	.....	.....	.....	.....	.....
9014	..do.....	V. Slight....	.3	.00	175.2	2.8	8.2	.124	.192	.003	.557	.....	.....	.....	.....	.....
9019	Mar. 1, 1901	Distinct	.5	.00	170.8	2.6	7.7	.072	.160	.004	.476	.....	.....	.....	.....	.....
9021	..do.....	V. Slight....	.4	.00	173.2	2.6	8.1	.136	.176	.003	.557	.....	.....	.....	.....	.....
9029	Mar. 12, 1901	Decided....	Muddy.	.00	213.2	2.1	13.1	.304	.416	.006	.514	.....	.....	.....	.....	.....
10294	Mar. 5, 1902	V. Decided..	..do.....	.00	429.2	2.75	25.1	.48	.832	.023	1.017	.....	.....	.....	.....	.....
10296	..do.....	..do.....	..do.....	.00	327.2	2.9	18.4	.408	.720	.018	.782	.....	.....	.....	.....	.....
13724	Nov. 7, 1905	Slight.....	.8	.00	133.0	2.15	15.35	.008	.352	.000	.200	.....	11900	1–	1–1+	2–
13897	Jan. 8, 1906	V. Decided..	.4	Earthy	203.0	1.5	12.0	.068	.352	.002	.477	129.2	1978	1–	2–	2–

ANALYSES OF WATER TAKEN FROM MISSISSIPPI RIVER AT ROCK ISLAND—FILTERED—CITY SUPPLY.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon.		
		Turbidity.	Color.	Odor.				Ammonia. Free.	Ammonia. Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
1150	July 20, 1896	....	....	....	188.0	1.6	11.8	.040	.400	.002	.300	....	....	.....	.....	.....
2808	Oct. 15, 1897	Distinct....	.4	.00	180 8	2.0	10.5	.040	.240	.003	.400	....	....	.....	.....	.....
2900	Nov. 5, 1897	Decided....	.25	.00	156.8	1.9	11.4	.162	.280	.000	.400	....	....	.....	.....	.....
3028	Dec. 7, 1897	Slight......	.2	.00	200.4	2.5	8.0	.192	.360	.000	.17	....	....	.....	.....	.....
3590	May 16, 1898	Distinct....	.15	.00	142.4	1.8	8.1	.002	.280	.000	.450	....	....	.....	.....	.....
3607	May 21, 1898	..do.......	.2	.00	154.0	1.8	7.8	.028	.240	.000	.300	....	....	.....	.....	.....
7372	April 18, 1900	..do.......	.3	.00	124.0	1.4	6.2	.024	.160	.001	.360	....	....	.....	.....	.....
9013	Feb. 23, 1901	..do.......	.4	.00	192.0	2.9	11.6	.068	.320	.001	.639	....	....	.....	.....	.....
9022	Mar. 1, 1901	Very slight.	.5	.00	180.0	2.7	9.7	.132	.240	.003	.637	....	....	.....	.....	.....
9030	Har. 12, 1901	Distinct....	Muddy	.00	176.8	2.6	9.6	.140	.256	.005	.515	....	....	.....	.....	.....
10297	Mar. 5, 1902	..do.......	.8	.00	202.0	2.9	9.8	.152	.352	.004	.956	....	....	.....	.....	.....
10298	Mar. 5, 1902	Slight......	.4	.00	161.6	2.9	7.8	.096	.288	.001	.840	....	....	.....	.....	.....
10301	Mar. 5, 1902	Very slight.	.3	.00	165.0	2.8	7.7	.080	.224	.001	1.080	....	....	.....	.....	.....
10302	Mar. 5, 1902	..do.......	.3	.00	167.6	2.9	7.2	.080	.192	.001	.960	....	....	.....	.....	.....
13636	Oct. 3, 1905	Decided....	....	....	163.0	1.4	10.75	.124	.224	.000	.160	....	....	.....	.....	.....
13637	Oct. 3, 1906	..do.......	.6	.00	159.0	1.2	10.5	.104	.160	.000	.240	....	....	.....	.....	.....
13725	Nov. 7, 1905	Slight......	.4	.00	148.0	1.4	15.55	.044	.272	.000	.280	....	1260	1?	2?	2—
13822	Dec. 12, 1905	Distinct....	.4	.00	177.0	1.0	10.5	.012	.224	.10	.320	135.2	....	2—	2—	.....
13898	Jan. 8, 1906	Decided....	.3	.00	194.0	1.5	11.25	.108	.336	.001	.520	136.0	....	1+	1?	1+
														1—	1—	1—

An analysis of the mineral content gave the following results:

IONS.

Amounts stated in parts per Million.

Laboratory No.	10326	13897
	March 17, 1902.	Feb. 15, 1906.
Potassium, K	.....	2.2
Sodium, Na	4.3	4.1
Ammonium, (NH_4)	.8	.1
Magnesium, Mg	1.9	13.7
Calcium, Ca	4.3	34.7
Ferrous, Fe	.....	.6
Aluminium, Al	.....	1.8
Silica, Si	2.1	6.4
Nitrate, NO_3	1.0	2.1
Chloride, Cl	.4	1.5
Sulphate, SO_4	9.1	16.3

Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
		10, 326	13, 897	10, 326	13, 897
Potassium nitrate,	KNO_3	.....	3.4	.....	.20
Potassium chloride,	KCl	.....	1.7	.....	.10
Sodium nitrate,	$NaNO_3$	1.4	.....	.08	.....
Sodium chloride,	NaCl	.7	1.2	.04	.07
Sodium sulphate,	Na_2SO_4	11.5	11.1	.67	.65
Sodium carbonate,	Na_2CO_3	.....	.....	.....	
Ammonium sulphate,	$(NH_4)_2SO_4$	2.0	.4	.12	.02
Ammonium carbonate,	$(NH_4)_2CO_3$	.8	.....	.05	
Magnesium sulphate,	$MgSO_4$	.....	10.7	.....	.62
Magnesium carbonate,	$MgCO_3$	6.5	39.8	.38	2.32
Calcium carbonate,	$CaCO_3$	10.7	86.6	.62	5.05
Oxide of iron and alumina	Fe_2O_3 + Al_2O_3	3.0	.....	.17	
Iron carbonate,	$FeCO_3$	.....	1.2	.....	.07
Alumina,	Al_2O_3	.....	1.8	.....	.11
Silica	SiO_2	4.5	13.5	.26	.79
Sus. matter,	.....	41.0	20	2.39	1.17
	Total	82.10	1.4	4.78	11.17

Rogers Park, Cook county, is situated on Lake Michigan within the Chicago city limits. The water supply is obtained from the lake. The system is owned by the Rogers Park Water Co.

For sanitary analysis see final table.

Roodhouse, Green county (2,351) has sent no report.

Roseville, Warren county (1,014) is situated on a small stream fed by springs. The city water is obtained from a well 1,260 feet deep. The system is owned by the city, having been established in 1895 at a cost of $15,000. Downie and Cook pumps are used. The daily consumption is 12,000 gallons. The system includes a stanapipe.

For sanitary analysis see final table.

Analyses of the mineral content gave the following results:

LABORATORY NO. 12094 MAY 2, 1904; LABORATORY NO. 12793. DECEMBER 20, 1904.

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Million.		Grains Per U. S. Gallon.	
	12094	12793			12094	12793	12094	12793
Potassium		19.1	Potassium chloride,	KCl	.....	35.0	.....	2.04
Sodium, Na	480.3	496.6	Sodium chloride,	NaCl	360.5	376.7	21.03	21.97
Ammonium, (NH_4)		1.7	Sodium sulphate,	Na_2SO_4	1043.1	1074.7	60.84	62.69
Magnesium, Mg	85.6	93.	Ammonium sulphate,	$(NH_4)_2SO_4$	.....	6.2	.....	.36
Calcium, Ca	213.6	225.5	Magnesium sulphate,	$MgSO_4$	425.4	462.3	24.81	26.97
Ferrous Fe.		2.3	Calcium sulphate,	$CaSO_4$	415.1	545.7	24.22	31.83
Alumina, Al_2O_3		13.8	Calcium carbonate,	$CaCO_3$	228.4	160.8	13.32	9.38
Silica, Si	4.5	5.8	Ferrous carbonate,	$FeCO_3$	.....	4.7	.....	.27
Nitrate, NO_3			Alumina,	Al_2O_3	.....	26.0	.....	1.52
Chloride, Cl	218.5	245.0	Silica,	SiO_2	.....	12.4	.....	.72
Sulphate, SO_4	1338.0	1486.0	Oxide of iron and aluminium.	Fe_2O_3 + Al_2O_3	6.4	.....	.37	.....
			Total		2478.9	2704.5	144.59	157.75

Rossville, Vermilion county (1,435) is located on a branch of Vermilion river. The water supply is obtained from wells. The system is owned by the village and was established in 1900.

Rushville, Schuyler county (2,292 school census 2,800) obtains its water supply from wells 1,500 feet deep, drilled into St. Peter sandstone. The system is owned by the city, having been established in 1894 at a cost of $15,000. The daily consumption is 15,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 10421, MAY 26, 1902.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S.Gallon
Sodium, Na	1192.2	Sodium chloride,	NaCl	2450.2	142.89
Ammonium, NH_4	2.4	Sodium sulphate,	Na_2SO_4	704.2	41.06
Magnesium, Mg	76.5	Ammonium sulphate,	$(NH_4)_2SO_4$	8.8	.51
Calcium, Ca	175.6	Magnesium sulphate,	$MgSO_4$	380.4	22.18
Silica, SiO_2	3.9	Calcium sulphate,	$CaSO_4$	339.7	19.81
Chloride, Cl	1485.0	Calcium carbonate,	$CaCO_3$	189.	11.02
Sulphate, SO_4	1026.3	Oxide of Iron and and Aluminium,	Fe_2O_3+ Al_2O_3	3.4	.2
		Silica,	SiO_2	8.4	.49
		Sus. matter		37.6	2.29
		Total		4121.7	240.45

St. Anne, Kankakee county (1,000 estimated 1,500) obtains city water supply from a well 130 feet deep. The system is owned by the St. Anne Light & Water Co. and was established in 1897 at a cost of $20,000. Deep well pumps are used. The daily consumption is 10,000 gallons.

St. Charles, Kane county, (2,675 estimated 3,500) is situated on Fox river. Report that water system is being established which will possibly be in operation by spring.

St. Elmo, Fayette county (1,050) obtains its water supply from a reservoir. The system is owned by the city and was established in 1905.

Salem, Marion county (1,642) has no general water supply.

Sandoval, Marion county (1,258) has no general water supply.

Sandwich, DeKalb county, (2,520 estimated 2,750) obtains its water supply from a bored well 100 feet deep. The system is owned by the city and was established in 1875 at a cost of $2,500.00. The system includes a standpipe. Worthington pumps are used.

Savanna, Carroll county (3,325 estimated 4,000) is situated on the Mississippi river. The water supply is obtained from wells 3,014 feet deep. The system is owned by the city, having been established in 1890 at a cost of $4,000. The pumps have a capacity of 1,000,000 gallons. Daily consumption is 500,000 gallons.

For sanitary analysis see final table.

Seneca, LaSalle county (1,036 estimated 1,600) is situated on the Illinois river. The water supply is obtained from the artesian wells. Plans and specifications for construction of water works system are now under consideration. The three flowing wells to be piped into cistern and pumped to reservoir on hill.

Shawneetown, Gallatin county (1,698) is situated on the Wabash river. There is no general water supply.

Sheffield, Bureau county (1,265) obtains its water supply from wells 40 to 45 feet deep. The system is owned by the village and was established in 1893 at a cost of $10,000. There is one single acting and one double acting pump. The daily consumption is 50,000 gallons.

Shelbyville, Shelby county (3,546, estimated 4,000) is situated on the Okaw river. The water supply is obtained from 22 wells 30 feet deep, sealed three feet under ground. The river furnishes auxiliary supply for fire protection. The system is owned by a private corporation and was established in 1886 at a cost of $50,000. Effingham, Carpenter, Worthington pumps of a capacity of 2,500,000 gallons are used. The daily consumption is 300,000 to 500,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 5144, JUNE 1, 1899.

Inos.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U.S.Gallon
Potassium, K	2.7	Potassium nitrate,	KNO_3	.2	.01
Sodium, Na	19.9	Potassium chloride,	KCl	4.9	.28
Ammonium (NH_4)	.3	Sodium chloride,	NaCl	19.6	1.13
Magnesium, Mg	46.5	Sodium sulphate	Na_2SO_4	37.5	2.19
Calcium, Ca	114.6	Ammonium sulphate	$(NH_4)_2SO_4$	1.1	.06
Ferrous, Fe	5.6	Magnesium sulphate	$MgSO_4$	172.9	10.09
Aluminium, Al	1.1	Magnesium carbonate,	$MgCO_3$	40.7	2.37
Silica, Si	5.3	Calcium carbonate,	$CaCO_3$	286.4	16.70
Nitrate, NO_3	.1	Ferrous carbonate,	$FeCO_3$	11.6	.67
Chloride, Cl	14.2	Alumina,	Al_2O_3	2.0	.11
Suphate, SO_4	164.4	Silica,	SiO_2	11.3	.66
			Total	588.2	34.27

ANALYSES OF WATER FROM KASKASKIA RIVER AT SHELBYVILLE, ILLINOIS, AUGUST 1 TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica SiO_2	Iron Fe	Aluminium, Al.	Calcium, Ca.	Magnesium, Mg.	Sodium and Potassium, Na.	Bi-Carbonate, HCO_3	Sulphate, SO_4	Chlorine, Cl	Nitrate NO_3
3401	Aug.	1–10	40	25	256	9.2	.1	....	44	23	15.	245	30	6.2	.5
3402	..do.	11–20	267	149	243	13.	.3	....	39	23	15.	233	28	6.5	2.1
3403	..do.	21–30	204	81	236	16.	.6	....	47	24	15.	217	23	5.	3.5
3404	..do.	31–9	50	34	279	20.	.1	....	55	30	3.	274	30	5.	2.0
3405	Sept.	10–19	50	41	218	9.6	.3	....	38	23	17.	285	25	10.	1.2
3406	..do.	20–29	40	28	272	9.	.06	....	50	29	24.	289	26	7.5	3.5
3407	..do.	30–9	121	63	285	33.	.13	....	45	25	17.	220	38	6.	.6
3408	Oct.	10–18	30	31	252	6.4	.06	....	42	32	18.	241	31	6.5	1.2
3409	..do.	20–29	20	19	301	14.	.02	....	57	28	19.	330	36	9.	.2
3410	..do.	30–6	20	13	340	13.	.03	....	64	38	23.	355	37	9.5	.3
3411	Nov.	10–19	30	16	334	8.8	.1	....	63	36	14.	345	33	11.	.6
3412	..do.	20–30	194	84	273	23.	.04	....	52	29	15.	275	31	5.3	3.
3413	Dec.	1–10	100	102	268	17.	.24	....	54	25	13.	267	38	5.5	7.
3414	..do.	11–20	40	45	285	18.	.24	....	56	26	14.	267	33	6.7	8.
3415	..do.	21–31	30	43	296	12.	.24	....	53	26	15.	293	42	5.5	10.
Average	.....	.....	82	52	276	14.8	.17	....	52	28	16	209	32	7.0	2.9

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	4.0	.23
Sodium chloride,	NaCl	11.6	.68
Sodium sulphate,	Na_2SO_4	31.8	1.85
Magnesium sulphate,	$MgSO_4$	13.2	.77
Magnesium carbonate,	$MgCO_3$	87.6	5.10
Calcium carbonate,	$CaCO_3$	129.8	7.57
Iron carbonate,	$FeCO_3$	.4	.02
Silica,	SiO_2	14.8	.86
Total		293.2	17.08

Sheldon, Iroquois county (1,103), obtains its water supply from a well 2,000 feet deep. The system is owned by the city.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY No. 4922, AUGUST 24, 1899.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	8.3	Potassium nitrate,	KNO_3	.7	.04
Sodium, Na	283.6	Potassium chloride,	KCl	15.4	.89
Ammonium, (NH_4)	.5	Sodium chloride,	NaCl	515.3	30.05
Magnesium, Mg	7.4	Sodium sulphate,	Na_2SO_4	25.9	1.51
Calcium, Ca	14.2	Sodium carbonate,	Na_2CO_3	166.9	9.73
Ferrous, Fe	.7	Ammonium carbonate,	$(NH_4)_2CO_3$	1.3	.07
Aluminium, Al	.5	Magnesium carbonate,	$MgCO_3$	25.8	1.50
Silicon, Si	3.5	Calcium carbonate,	$CaCO_3$	35.5	2.07
Nitrate, NO_3	.5	Ferrous carbonate,	$FeCO_3$	1.5	.08
Chloride, Cl	320.0	Alumina,	Al_2O_3	.9	.05
Sulphate, SO_4	17.5	Silica,	SiO_2	7.4	.43
		Total		796.6	46.42

Sorento, Bond county (1,000), has sent no report.

Sparta, Randolph county (2,941, estimated 3,500), has a water supply for street sprinkling and general purposes which is obtained from a small lake. It is not used for domestic purposes.

Springfield, Sangamon county (34,159), is situated on the Sangamon river and obtains its water supply from the river and from filter galleries near the river. System owned by the city.

For sanitary analysis see following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF SPRINGFIELD.

Serial number.	Date of collection	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.
		Turbidity.	Color.	Odor.				Free.	Albuminoid.		
3519	May 2, 1898	Slight....	.03	00	259.2	5.	2.3	.196	.070	.001	.45
5134	June 1, 1899	..do.....	.01	00	108.	.81	.6	.348	.032	.011	.16
8744	Nov. 6, 1900	..do.....	.02	00	268.8	3.8	3.3	.052	.138	.000	.8
10411	May 21, 1902	Distinct...	.3	00	298.8	4.5	2.7	.12	.048	.003	.397
10412	..do.....	Decided...	Yellow..	00	285.2	5.1	3.7	.528	.086	.000	.27
10414	..do.....	Distinct...	Muddy..	00	285.6	4.7	3.1	.036	.030	.000	.64
10415	..do.....	Decided...	..do.....	00	339.6	5.1	7.6	.088	.256	.070	2.33
10874	Feb. 1, 1903	Distinct...	.1	00	290.	4.1	3.	.112	.114	.003	.557
10875	..do.....	Slight....	.0	00	183.2	4.0	5.7	.064	.224	.003	.118
10876	..do.....	Distinct...	.1	00	289.2	4.0	2.3	.032	.098	.003	.597
10877	..do.....	..do.....	.1	00	284.0	4 05	2.3	.064	.098	.014	.666
13276	Aug. 23, 1905	Decided...	Muddy..	00	232.4	5.6	6.35	.060	.182	.000	.040
13469	..do.....	..do.....	..do.....	00	284.	8.0	5.5	.036	.144	.000	3.6
14512	June 11, 1906	Distinct...	..do.....	1 Ear	437.	6.0	3.4	.056	.376	.000	.64

Spring Valley, Bureau county (6,214), situated on the Illinois river, obtains its water supply from artesian wells. The system is owned by the city.

Staunton, Macoupin county (2,786). It obtains its city water supply from a reservoir fifty feet deep. The system is owned by the city and was established in 1887.

For sanitary analysis see final table.

An analysis of the mineral content of a well suggested for city supply gave the following results:

LABORATORY NO. 10835, JANUARY 2, 1903.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Sodium, Na	40.0	Sodium nitrate,	$NaNO_3$	3.5	.20
Ammonium, (NH_4)	.7	Sodium chloride,	$NaCl$	10.1	.59
Magnesium, Mg	30.8	Sodium sulphate,	Na_2SO_4	107.9	6.29
Calcium, Ca	54.7	Ammonium sulphate,	$(NH_4)_2SO_4$	2.6	.15
Ferrous, Fe	5.2	Magnesium sulphate,	$MgSO_4$	153.3	8.94
Aluminium, Al	.6	Calcium sulphate,	$CaSO_4$	185.8	10.84
Silica, SiO_2	2.7	Ferrous sulphate,	$FeSO_4$	14.1	.83
Nitrate, NO_3	2.5	Aluminium sulphate,	$Al_2(SO_4)_3$	38.9	2.27
Chloride, Cl	6.1	Silica,	SiO_2	5.7	.33
Sulphate, SO_4	401.8	Sulphuric acid,	H_2SO_4	32.	1.87
		Total		553.9	32.31

Sterling, Whiteside county (6,309), is situated on the Rock river. The water supply is obtained from wells 1,435, 1,625 and 1,826 feet deep. The system is owned by the Sterling Water Company and was installed in 1886. Dean pumps, capacity 5,000,000 gallons, are used. The daily consumption is 500,000 gallons.

Analyses of the mineral content gave the following results:

LABORATORY NO. 4212, OCT. 12, 1898, AND 6300, NOV. 13. 1899.

Ions	Parts Per Million.		Hypothetical Combinations.	Parts Per Million.		Grains Per U. S. Gal.	
	4212	6300		4212	6300	4212	6300
Potassium, K	5.9	6.7	Potassium nitrate, KNO_3	2.8	.9	.16	.05
Sodium, Na	5.8	6.2	Potassium chloride, KCl	9.2	11.4	.54	.66
Magnesium, Mg	36.3	35.7	Sodium Chloride, NaCl	9.2	5.9	.54	.34
Calcium, Ca	66.9	61.8	Sodium sulphate, Na_2SO_4	6.9	11.9	.40	.69
Ferrous, Fe	.07	.3	Magnesium sulphate, $MgSO_4$	29.7	21.3	1.73	1.23
Aluminium, Al	.4	.4	Magnesium carbonate, $MgCO_3$	105.4	109.2	6.14	6.37
Silicon Si	4.1	4.2	Calcium carbonate, $CaCO_3$	167.1	154.2	9.74	8.99
Nitrate, NO_3	1.7	.6	Ferrous carbonate, $FeCO_3$	.2	.6	.01	.03
Chloride, Cl	10.0	9.0	Alumina, Al_2O_3	.8	.7	.05	.04
Sulphate, SO_4	28.4	25.1	Silica, SiO_2	8.7	8.9	.51	.52
			Total	340.	325.	19.82	18.92

Stonington, Christian county (438, estimated 1,000). The water Supply is obtained from bored wells. The system is owned by the city and was established in 1906 at a cost of $4,000. Cook deep well pumps are used.

Streator, LaSalle county (14,079), is situated on the Vermilion river and obtains its water supply from the river. The system is owned by the Streator Aqueduct Company and was established in 1886 at a cost of $400,000. Gaskell pumps, with a capacity of 9,500,000 gallons, are used. The daily consumption is 1,700,000 gallons. The water is treated with alum and filtered.

For sanitary analysis see the following table:

ANALYSES OF WATER FROM VERMILION RIVER AT STREATOR, ILLINOIS—FILTERED—CITY SUPPLY.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as—				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
								Free.	Albuminoid.							
933	June 2, 1896	.....	.....	.....	398.0	4.2	5.5	.024	.214	.035	5.20	.....	.....	.....	.....	.....
1017	June 22, 1896	.....	.....	.....	378.0	4.6	4.5	.012	.096	.000	3.50	.....	.....	.....	.....	.....
1092	July 9, 1896	.....	.....	.....	336.0	5.5	3.2	.002	.116	.000	2.00	.....	.....	.....	.....	.....
1214	Aug. 1, 1896	.....	.....	.....	367.6	3.2	4.9	.004	.200	.001	3.50	.....	.....	.....	.....	.....
1489	Oct. 9, 1896	.....	.....	.....	378.0	3.5	2.3	.006	.066	.000	2.80	.....	.....	.....	.....	.....
14846	Aug. 24, 1906	Decided....	.....	2 Musty.	341.0	12.0	10.8	.104	.528	.000	.280	166.8	750	+	2+	+
15097	Oct. 2, 1906	Distinct....	.....	00	305.	3.5	5.5	.016	.160	.002	.720	163.2	160	+	+—	2—

ANALYSES OF WATER FROM VERMILION RIVER AT STREATOR, ILLINOIS—UNFILTERED—CITY SUPPLY.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
		Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
								Free.	Albuminoid.							
932	June 2, 1896	.....	.....	.....	398.0	4.2	5.5	.024	.214	.035	5.2	.....	.....	.....	.....	.....
1246	Aug. 7, 1896	.....	.....	.....	334.0	4.3	3.4	.002	.086	.000	2.58	.....	.....	.....	.....	.....
6192	Oct. 30, 1899	Distinct....	1.08	00	331.6	11.0	5.4	.008	.304	.000	.68	.....	.....	.....	.....	.....
14845	Aug. 24, 1906	Decided....	.2	3 Musty.	360.0	12.5	16.8	.080	.416	.000	.28	174.6	3.160	1+	1+1—	2+
15098	Oct. 2, 1906	..do.....	.....	5 Veg.	328.	5.0	7.2	.344	.272	.015	.43	170.8	1.400	1—	1+1—	2—

Analysis of the mineral content gave the following results:

LABORATORY NO. 6192. OCT. 30, 1899.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	3.3	Potassium nitrate,	KNO_3	4.7	.27
Sodium, Na	19.5	Potassium chloride,	KCl	2.8	.16
Magnesium, Mg	32.7	Sodium chloride	NaCl	15.2	.88
Calcium, Ca	52.8	Sodium sulphate,	Na_2SO_4	41.7	2.43
Ferrous, Fe	.8	Magnesium sulphate,	$MgSO_4$	52.3	3.05
Aluminium, Al	.7	Magnesium carbonate	$MgCO_3$	77.2	4.50
Silicon, Si	5.3	Calcium carbonate,	$CaCO_3$	131.9	7.69
Nitrate, NO_3	2.9	Ferrous carbonate,	$FeCO_3$	1.6	.09
Chloride, Cl	10.5	Alumina,	Al_2O_3	1.3	.07
Sulphate, SO_4	70.0	Silica,	SiO_2	11.3	.66
		Total		340.0	19.80

ANALYSES OF WATER FROM VERMILION RIVER AT STREATOR, ILLINOIS, AUGUST 1st TO DECEMBER 31, 1906.

Designation.	Month.	Composite sample.	Turbidity.	Suspended matter.	Total solids.	Silica SiO_2	Iron Fe	Aluminium. Al.	Calcium, Ca	Magnesium, Mg	Sodium and Potassium, Na	Bi-Carbonate, HCO_3	Sulphate, SO_4	Chlorine, Cl	Nitrate, NO_3
3601	Aug.	1–10	40	22	357	23	.1	....	44	36	27	248	72	10	2.5
3602	..do.	11–20	30	16	321	13	.1	....	40	35	23	247	74	14	2.1
3603	..do.	21–30	50	29	280	10	.6	....	39	33	16	198	64	13	2.5
3604	..do.	31–9	60	48	243	15	.24	....	39	28		165	57	6.	2.5
3605	Sep.	10–19	20	15	247	9.6	.14	....	36	28	18	213	56	5.	1.6
3606	..do.	20–29	40	26	254	11	.16	....	43	23	18	205	56	8.	1.0
3607	..do.	31–9	50	38	240	5.8	.2	....	37	23	20	190	53	7.	1.0
3608	..do.	10–18	20	23	268	4.6	.05	....	41	28	22	212	66	10	1.7
3609	Nov.	22–29	20	13	294	9.0	.05	....	47	28	24	260	60	10	1.2
3610	..do.	30–8	20	11	309	9.0	.03	....	49	24	23	213	69	9.3	.3
3611	..do.	9–19	20	10	322	11	.02	....	48	33	20	254	70	10	.3
3612	..do.	20–30	60	36	317	17	.1	....	55	31	18	260	65	9.3	7.
3613	Dec.	2–10	110	56	333	11	.17	....	61	31	23	280	68	5.5	8.
3614	..do.	11–20	30	33	351	15	.14	....	63	33	18	274	69	4.5	16.
3615	..do.	21–31	20	23	397	17	.12	....	67	34	21	329	86	5.7	10.
Average	.....	.....	39	27	302	24	.15	....	47	30	21	237	66	8.5	3.8

The following hypothetical combinations were obtained from the average:

		Parts Per Million.	Grains Per U. S. Gallon.
Sodium nitrate,	$NaNO_3$	5.2	.30
Sodium chloride,	NaCl	14.0	.81
Sodium sulphate,	Na_2SO_4	43.5	2.53
Magnesium sulphate,	$MgSO_4$	47.1	2.75
Magnesium carbonate,	$MgCO_3$	71.0	4.14
Calcium carbonate,	$CaCO_3$	117.3	6.84
Iron carbonate,	$FeCO_3$	.3	.02
Silica,	SiO_2	24.0	1.40
Total		322.4	18.79

Sullivan, Moultrie county (2,399, estimated 3,500), obtains its water supply from wells 150 to 300 feet deep. The system is owned by the city and was established in 1886. The daily consumption is about 200,000 gallons. The system includes an elevated tank. An enlargement of the present system and the possibility of obtaining a water supply from the Okaw river, three miles away, is being considered.

Sumner, Lawrence county (1,268), has no general water supply.

Sycamore, DeKalb county (3,658, estimated 4,500), is situated on the Kishwaukee river and obtains its water supply from wells in St. Peters sandstone. The system is owned by a company and was established in 1902. The location of the pumping plant has been changed since the first installation. The pumping capacity is 5,500 gallons per minute.

Taylorville, Christian county (4,248), obtains its water supply from wells. The system is owned by the city.

Tolono, Champaign county (845), obtains its water supply from two drilled wells one hundred and forty feet deep. The plant is owned by the village and was established in 1895 at a cost of about $12,000. One Gould pump, with a capacity of fifty gallons per minute, and one Cook pump, with a capacity of ninety gallons per minute, are used. The daily consumption is about 50,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 1772, DEC. 28, 1896.

Ions.	Parts Per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon.
Potassium, K	5.1	Potassium nitrate,	KNO_3	.4	.02
Sodium, Na	125.9	Potassium chloride,	KCl	9.5	.55
Ammonium, (NH_4)	9.0	Sodium chloride,	NaCl	1.7	.09
Magnesium, Mg	30.1	Sodium sulphate,	Na_2SO_4	7.1	.41
Calcium, Ca	80.9	Sodium carbonate,	Na_2CO_3	277.4	16.17
Iron, Fe	1.1	Ammonium carbonate,	$(NH_4)_2CO_3$	24.0	1.40
Aluminium, Al	1.7	Magnesium carbonate,	$MgCO_3$	104.9	6.11
Silicon, Si	11.7	Calcium carbonate,	$CaCO_3$	202.0	11.77
Nitrate, NO_3	.3	Iron carbonate,	$FeCO_3$	2.9	.17
Chloride, Cl	5.5	Alumina,	Al_2O_3	3.2	.18
Sulphate, SO_4	4.8	Silica,	SiO_2	23.2	1.34
		Total		656.3	38.24

Toluca, Marshall county (2,629), has sent no report.

Toulon, Stark county (1,057), situated on Indian creek, has no general water supply.

Trenton, Clinton county (1,706, estimated 2,200), has no general water supply.

Troy, Madison county (1,080), has no general water supply.

Tuscola, Douglas county (2,569), has sent no report.

Upper Alton, Madison county (2,373), is situated on the Mississippi river and obtains its water supply from the river.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF UPPER ALTON.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
								Ammonia.				
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
12654...	Nov. 11.1904	Distinct.	.6	00	196.4	9.	8.	.040	.240	.000	.44	.....
14941...	Sept. 10. 1906	..do.....	.4	00	262.0	9.0	4.4	.032	.152	.000	.560	138.2
14958...	..do.....	Decided.	.2	00	238.0	9.5	5.7	.012	.176	.000	1.04	134.4
15030...	Sept. 25. 1906	..do.....	Muddy.	00	248.0	9.0	6.6	.024	.216	.000	1.36	147.8
15031...	..do.....	..do.....	..do....	00	263.0	9.0	6.5	.024	.224	.000	.40	165.1
15274...	Oct. 31. 1906	..do.....	.1	00	215.0	10.0	5.75	.024	.136	.000	.760	140.2

Urbana, Champaign county (5,728), obtains its water supply from eight wells in the drift 160 feet deep. The system is owned by the Champaign and Urbana Water Company. The pumps have a capacity of 5,000,000 gallons. The daily consumption is 500,000.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF URBANA (CHAMPAIGN.)

Serial number.	Date of collection.	Appearance.		Odor.	Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as			
								Ammonia.			
		Turbidity.	Color.					Free.	Albuminoid.	Nitrites.	Nitrates.
2078	April 5, 1897	Distinct.	.6	.00	487.2	2.2	4.4	3.000	.072	.000	.120
3304	Feb. 28, 1898	..do.	.8	.00	396.4	2.0	5.5	4.000	.112	.000	.048
5419	July 15, 1899	..do.	1.0	.00	376.0	2.2	5.0	3.12	.138	.005	.120
10190	Jan. 17, 1902	..do.	.2	.00	381.2	2.4	6.5	3.68	.152	.000	.170
10249	Feb. 7, 1902	Slight.	.2	.00	250.4	2.8	6.3	2.0	.116	.000	.090
10745	Nov. 9, 1902	Distinct.	.7	.00	393.6	1.85	5.2	3.68	.142	.000	.250
10763	Nov. 20, 1902	Very slight.	.1	.00	378.8	1.5	5.3	3.12	.156	.000	.19
12657	Nov. 15, 1904	Distinct.	.7	.00	390.	2.4	6.1	3.520	.224	.001	.12
13188	May 27, 1905	Decided.	.4	.00	401.2	1.75	4.95	3.36	.170	.000	.200
13709	Oct. 31, 1905	Clear.	.00	.00	363.0	2.0	4.95	3.36	.140	.000	.12

The analysis of the mineral content gave the following results:

Ions.	Amounts stated in parts per Million.			
Laboratory No.	1416	2078	3304	13869
Date	Sept. 20, 1896.	April 5??97.	Feb. 28, 1898	Dec. 31, 1905.
Potassium, K	4.3	2.2	3.2	2.4
Sodium, Na	27.6	19.6	27.6	26.5
Ammonium, NH_4	4.11	3.8	5.1	3.9
Magnesium, Mg	35.4	10.1	35.6	35.6
Calcium, Ca	76.1	99.7	78.2	69.5
Ferrous, Fe	2.85	.5	3.4	3.4
Aluminium, Al	1.5	4.5	1.2	1.5
Silicon, Si	8.7	9.4	8.3	13.7
Nitrate, NO_3	.2	.6	.2	.5
Chloride, Cl	2.56	2.2	2.0	3.5
Sulphate, SO_4	1.6	.9	.8	2.1
Phosphorus, PO_4	2.09			

Hypothetical Combinations.		Parts per Million.				Grains per U. S. gallon.			
		1416	2078	3304	13869	1416	2078	3304	13869
Potassium nitrate,	KNO_3	.3	.9	.4	.9	.02	.05	.02	.05
Potassium chloride,	KCl	1.0	3.5	4.2	4.0	.05	.20	.24	.23
Potassium sulphate,	K_2SO_4	2.6	.....	1.5	.....	.15	.....	.09	.....
Sodium chloride,	NaCl	3.4	.9	.....	2.6	.20	.05	.....	.15
Sodium sulphate,	Na_2SO_4	.....	1.4	.....	3.2	.....	.08	.....	.19
Sodium carbonate,	Na_2CO_3	60.5	43.3	64.3	56.4	3.53	2.53	3.75	3.29
Ammonium carbonate,	$(NH_4)_2CO_3$	19.7	10.1	13.6	10.4	1.14	.58	.79	.61
Magnesium carbonate,	$MgCO_3$	120.7	35.2	124.1	123.7	7.04	2.05	7.24	7.23
Calcium carbonate,	$CaCO_3$	189.1	248.0	195.0	173.8	11.03	14.47	11.38	10.14
Iron carbonate,	$FeCO_3$	5.8	1.0	7.1	7.1	.33	.06	.41	.41
Alumina,	Al_2O_3	3.0	8.4	2.1	2.9	.17	.49	.12	.17
Silica,	SiO_2	18.5	20.0	17.4	13.7	1.08	1.17	1.01	.80
Potassium phosphate,	K_2PO_4	4.8	.....	....	.....	.28	.....	.....	.....
Total		429.4	372.7	429.7	398.7	25.02	21.73	25.05	23.26

Utica, LaSalle county (1,150, estimated 1,200), situated on Illinois river, obtains its water supply from wells. The system is owned by the city.

Vandalia, Fayette county (2,665), is situated on Kaskaskia river and obtains its water supply from the river. The system is owned by the city and was established in 1896 at a cost of $25,000. Fairbanks-Morse and Worthington pumps are used.

For analysis of Kaskaskia river see Carlyle and Shelbyville.

Venice, Madison county (2,450, estimated 4,000), is situated on Mississippi river and obtains its water supply from Granite City Water Company.

Vermont, Fulton county (1,195), has no general water supply.

Vienna, Johnson county (1,217), has no general water supply.

Virden, Macoupin county (2,280), has sent no report.

Virginia, Cass county (1,600), has no general water supply.

Walnut, Bureau county (791), obtains its water supply from wells. The system is owned by the city.

Warren, JoDaviess county (1,327, estimated 1,800), obtains its water supply from two wells 700 feet and 900 feet deep, respectively. The system is owned by the city and was established in 1896 at a cost of $15,000. There are two deep well pumps. The daily consumption is 35,000 gallons.

For sanitary analysis see final table.

Warsaw, Hancock county (2,335, estimated 2,500), is situated on the Mississippi river. The city is partly supplied by an artesian well. The system is owned by the city and was established in 1887 at a cost of $3,500. Only factories and business houses are supplied.

Washington, Tazewell county (1,459), obtains its water supply from wells eighty to ninety feet deep. The system is owned by the city and was established about 1887.

Waterloo, Monroe county (2,114), obtains its water supply from springs and creek that is supplied by springs. The system is owned by the city and was established in 1897.

Watseka, Iroquois county (2,505), is situated on Iroquois river. It obtains its water supply from a well 150 feet deep. The system is owned by the city and was established in 1891. Supply from the wells is said to be less than the demand. The system includes a standpipe.

For sanitary analysis see final table.

Waukegan, Lake county (9,426, estimated 16,500), is situated on Lake Michigan. The water supply is obtained from the lake. Originally the water supply was obtained from artesian wells, but the supply was found to be insufficient. The system is owned by the city and was established in 1894 at a cost of $178,845. There are two Dean pumps of a capacity of 2,000,000 gallons each. The daily consumption is 1,800,000 gallons. The intake will probably be changed to a point north of the city. The water supply is not filtered and the quality is not satisfactory.

For sanitary analysis see the following table:

SANITARY CHEMICAL ANALYSIS OF THE MUNICIPAL WATER SUPPLY OF WAUKEGAN.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as ammonia.		Nitrites.	Nitrates.	Alkalinity.
		Turbidity.	Color.	Odor.				Free.	Albuminoid.			
149...	Nov. 4, 1895	.....	.....	.....	139.4	2.9	1.1	.02	.128	.000	.100	.....
150...	..do.....	.....	.....	.....	148.4	2.9	1.1	.01	.095	.000	.06	.....
215...	Nov. 21, 1895	.....	.....	.....	145.8	2.6	1.15	.005	.083	.000	.12	.....
225...	Nov. 26, 1895	.....	.....	.....	138.6	3.0	1.55	.122	.206	.000	.14	.....
275...	Dec. 16, 1895	.....	.....	.....	173.2	2.85	2.2	.015	.118	.000	.12	.....
9462...	Oct. 11, 1901	V. decid.	Yellow	.00	225.6	4.6	14.6	.56	.8	.000	.16	.....
9632...	Dec. 31, 1901	Distinct.	.03	.00	132.4	3.2	2.7	.020	.080	.001	.16	.....
9633...	..do.....	..do.....	.02	.00	139.6	3.4	3.8	.016	.098	.001	.16	.....
10220...	Jan. 27, 1902	..do.....	.02	.00	142.8	3.3	3.3	.04	.092	.001	.21	.....
10867...	Jan. 29, 1903	..do.....	.0	.00	179.6	4.3	3.3	.02	.003	.477	.....	.....
10868...	..do.....	..do.....	.0	.00	150.0	2.8	2.6	.034	.108	.000	.4	.....
12331...	Aug. 11, 1904	..do.....	.0	.00	166.4	3.2	2.8	.018	.092	.000	.12	.....
14252...	April 25, 1906	Decided..	.0	.00	172.	3.15	3.6	.080	.224	trace	.12	110.
14799...	Aug. 14, 1906	V. slight	.0	Veg't'b	169.	3.5	3.85	.036	.184	.000	.200	114.4
14800...	..do.....	Clear....	.0	..do....	187.	3.0	3.40	.026	.128	.000	.320	118.3
15022...	Sept. 24, 1906	Slight...	.0	.0	172.	3.0	3.8	.016	.112	.000	.64	115.2
15369...	Nov. 19, 1906	Decided..	0.1	.0	150.	4.0	2.4	.028	.098	.000	.240	115.2
15494...	Dec. 28, 1906	Distinct.	.0	.0	484.	15.0	3.75	.528	.096	.023	.657	166.3

Waverly, Morgan county (1,573), has no general water supply.

Wenona, Marshall county (1,456, estimated 2,000). The proposed water supply is to be obtained from an artesian well 1,895 feet deep.

West Chicago, DuPage county (1,877, estimated 2,600), obtains its water supply from an artesian well 870 feet deep. The system is owned by the city and was established in 1896 at a cost of $30,000. There is a Dean pump of 500,000 gallons capacity. The daily consumption is 60,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

Ions.	Parts Per Million.		Hypothetical Combinations.		Parts Per Milliion.		Grains Per U. S. Gallon.	
Date.	July 21, 1897.	July 14, 1904.						
Laboratory No.	2474	12236			2474	12236	2474	12236
Potassium, K	2.4	1.9	Potassium nitrate,	KNO_3	.1	.6	.01	.04
Sodium, Na	21.6	26.3	Potassium chloride,	KCl	4.2	3.2	.24	.19
Magnesium, Mg	30.7	40.1	Sodium chloride,	NaCl	13.2	22.3	.77	1.30
Calcium, Ca	56.9	65.1	Sodium sulphate,	Na_2SO_4	51.8	54.3	3.02	3.17
Iron, Fe	1.9	1.2	Magnesium sulphate,	$MgSO_4$	9.0	36.0	.52	2.10
Aluminium, Al	1.1	.7	Magnesium carbonate,	$MgCO_3$	104.0	114.2	6.06	6.65
Silicon, Si	11.8	6.6	Calcium carbonate,	$CaCO_3$	139.7	162.5	8.15	9.48
Nitrate, NO_3	.8	.3	Iron carbonate,	$FeCO_3$	3.8	2.6	.22	.15
Chloride, Cl	10.	14.8	Alumina,	Al_2O_3	1.8	1.4	.10	.08
Sulphate, SO_4	42.1	65.5	Silica,	SiO_2	24.8	14.0	1.44	.82
			Total		352.3	411.1	20.53	23.98

West Hammond, Cook county (2,935, estimated 5,000), is situated on the Calumet river. It obtains its water supply from Lake Michigan, through the city of Hammond, Ind.

Westville, Vermilion county (1,605), has no general water supply.

Wheaton, DuPage county (2,345), obtains its water supply from two wells 175 feet deep. The system is owned by the city and was established in 1896 at a cost of $12,000. The system includes a standpipe.

White Hall, Greene county (2,030, estimated 2,500), is situated near Apple creek, a branch of the Illinois river. The water supply is obtained from a pond. The system is owned by the city and was established in 1899 at a cost of $20,000. The pumps have a capacity of 15,000 gallons per hour. The daily consumption is 125,000 gallons.

For sanitary analysis see final table.

Wilmette, Cook county (2,300, estimated 4,000), is situated on Lake Michigan. Wilmette obtains its water supply from Lake Michigan, buying it from the city of Evanston, which see.

Wilmington, Will county (1,420), is situated on the Kankakee river and obtains its water supply from the river.

Winchester, Scott county (1,711), has no general water supply.

Winnetka, Cook county (1,833, estimated 2,800), is situated on Lake Michigan and obtains its water supply from the lake. The system was established in 1893 at a cost of $140,000 and is owned by the city.

For sanitary analysis see the following table:

EXAMINATION OF WATER FROM LAKE MICHIGAN—WINNETKA CITY SUPPLY—FILTERED AND UNFILTERED.

Serial number.	Date of collection.	Appearance.			Residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.	Bacteria per c. c.	Colon Bacillus.		
								Ammonia.								
		Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.			10 c. c.	1 c. c.	0.1 c. c.
14484	June 4, 1906	Distnict	.0	5Muddy . . .	180.	5.0	4.9	.032	.242	.000	.280	114.5	3200	1 –	1 + 1–	2 –
14485	. . do	Very slight.	.00	.00	167.0	4.5	2.75	.044	.124	.000	.240	116.4	750	1 –	2	2 –
14596	July 9, 1906	Distinct	.2	.00	152.0	5.0	3.5	.096	.104	.000	.280	112.5	. . . . .	. . . . .	. . . . .	. . . . .
14820	Aug.20, 1906	Very slight .	.00	.00	174.	3.5	3.35	.018	.082	.000	.240	114.4	. . . . .	. . . . .	. . . . .	. . . . .
14867	Aug. 28, 1906	Decided	.00	.00	166.	3.5	2.7	.008	.082	.000	.200	107.5	430	1 +	1 + 1–	2 –
15212	Oct. 22, 1906	. . do	.2	.00	147.	3.0	3.4	.014	.116	.000	.240	117.1	7500	1 –	1 + 1–	2 –
15340	Nov. 12, 1906	. . do	.2	.00	144.	4.0	2.25	.048	.088	.002	.240	117.1	650	1 –	2 –	2 –

Winstanley Park, St. Clair county (1....055), is part of the city of East St. Louis.

Woodstock, McHenry county (2,502, estimated 5,000), obtains its water supply from two wells 1,025 feet deep. The system is owned by the city and was established in 1903 at a cost of $2,500. An air compressor pump is used with a capacity of 480 gallons per minute. The daily consumption is 150,000 gallons. The system includes a reservoir of 10,000 gallons capacity and a standpipe.

Wyoming, Stark county (1,277, estimated 2,500), is situated about a mile from Spoon river. The water supply is obtained from a well 1,557 feet deep. The system is owned by the city and was established in 1903 at a cost of $35,000. The daily consumption is 200,000 gallons.

For sanitary analysis see final table.

An analysis of the mineral content gave the following results:

LABORATORY NO. 10723, OCT. 6, 1902.

Ions.	Parts per Million.	Hypothetical Combinations.		Parts Per Million.	Grains Per U. S. Gallon
Potassium, K	21.6	Potassium nitrate.	KNO_3	.9	.05
Sodium, Na	219.5	Potassium chloride.	KCl	40.6	2.37
Ammonium, NH_4	1.9	Sodium chloride,	NaCl	505.8	12.01
Magnesium, Mg	24.4	Sodium sulphate,	Na_2SO_4	244.2	14.24
Calcium, Ca	29.4	Sodium carbonate,	Na_2SO_3	95.5	5.57
Ferrous, Fe	.15	Ammonium carbonate,	$(NH_4)_2CO_3$	5.1	.30
Aluminium, Al	.3	Magnesium carbonate,	$MgCO_3$	85.3	4.98
Silicon, Si	6.6	Calcium carbonate,	$CaCO_3$	73.6	4.30
Nitrate, NO_3	.6	Ferrous carbonate,	$FeCO_3$	.3	.02
Chloride, Cl	144.0	Alumina,	Al_2O_3	.6	.04
Sulphate, SO_4	165.1	Silica,	SiO_2	14.0	.82
		Sus. matter,		15.9	.91
			Total	781.5	45.61

Yorkville, Kendall county (840), is located on the Fox river. The water supply is obtained from four springs. The system is owned by the village and was established in 1880.

CITY SUPPLIES NOT INDICATED ON MAP.

Berwyn,
Braidwood,
Chadwick,
Marshall.
Oak Park,
Onarga,
Oregon,
Rogers Park,
Utica,
Walnut,
Wenona.

Sanitary Analysis of Waters from Illinois Cities—Final Table

Serial number.	Town.	Date of collection.	Appearance.			Total residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.
									ammonia.				
			Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates.	
2913	Aledo	Nov. 10, 1897	Slight	.04	000	1792.8	430.0	8.1	1.432	.052	.003	.20	.....
1964	Alton	Mar. 2, 1897	do	.08	000	249.2	5.8	4.7	.004	.320	.018	2.40	.....
15308	do	Nov. 10, 1906	Decided	.5	000	224.0	10.00	6.85	.032	.192	.001	.480	157.4
15309	do	do	Clear	.2	000	202.0	10.00	5.25	.024	.128	.004	.440	144.0
2929	Amboy	Nov. 12, 1897	Distinct	.7	000	349.2	.5	2.7	.72	.018	.000	.50	.....
11262	do	Aug. 11, 1903	do	.2	000	406.8	3.4	3.40	.36	.048	.002	.08	.....
11263	do	do	do	.6	000	366.4	1.4	2.7	.51	.032	.000	.08	.....
11264	do	do	Slight	.1	000	379.2	2.1	2.7	.16	.028	.004	.24	.....
11265	do	do	Decided	Yellow.	Tar	375.2	1.87	2.7	.36	.032	.000	.08	.....
	Altanta—See table page 13.												
	Aurora—See table page 14.												
	Averyville—See table page 15.												
	Belleville—See table page 16.												
5977	Belvidere	Sept. 29, 1899	Slight	.02	000	336.0	7.0	1.1	.300	.028	.009	.40	.....
6356	Bement	Nov. 24, 1899	do	.3	000	540.8	26.0	8.20	2.400	.202	.000	.16	.....
12159	Berwyn	June 17, 1904	Clear	.0	000	730.8	83.7	1.70	.162	.056	.060	.14	.....
3570	Bushnell	May 12, 1898	Distinct	.04	000	2402.0	392.0	5.6	1.36	.022	.000	.25	.....
15007	do	Sept. 19, 1906	do	1.0	5 Musty....	564.0	2.0	9.5	7.4	.320	.007	.233	529.9
15008	do	do	do	1.0	000	1917.0	390.0	5.5	1.04	.040	.007	.193	270.7
15009	do	do	do	1.0	000	1916.0	397.0	5.3	1.04	.072	.010	.230	268.8
9070	Byron	April 13, 1901	V. slight	.02	000	276.8	4.1	1.9	.048	.034	.000	.08	.....
9235	do	July 29, 1901	do	.01	000	421.6	21.0	1.8	.004	.038	.000	12.00	.....
4879	Cairo	Mar. 29, 1899	Decided	.10	000	542.0	3.2	15.2	.026	.400	.018	.80	.....
2102	Cambridge	April 7, 1897	Distinct	.2	000	1036.6	161.0	1.9	1.4	.016	.015	.176	.....
	Canton—See page 18.												
2552	Carbondale	Aug. 12, 1897	Slight	.03	000	1787.6	820.0	7.0	1.2	.014	.000	.20	.....
2553	do	do	do	.03	000	1758.0	815.0	7.3	1.20	.014	.000	.20	.....
14721	do	Aug. 6, 1906	None	.0	000	2493.0	1210.0	7.3	.606	.054	.176	.28	376.3
14722	do	do	Slight	.0	000	1391.0	555.0	8.1	.164	.068	.007	.28	397.7

9415	Carlinville	Sept. 27, 1901	Decided	Muddy	000	120.	2.2	7.0	.048	.248	.000	.20	.....
256	Carmi	Dec. 7, 1895	.....	.....	.....	1571.4	.....	.....	.....	.....	.....	.....	.....
10535	Carrollton	Aug. 4, 1902	Clear	.00	000	339.6	3.8	1.8	.024	.028	.000	3.36	.....
10767	..do.	Nov. 26, 1902	Distinct	Muddy	Vinegar	342.0	4.8	9.5	.060	.152	.004	2.396	.....
10831	..do.	Dec. 30, 1902	V. slight	000	Musty	315.2	4.0	2.1	.040	.060	Trace	3.12	.....
10446	Centralia	June 12, 1902	..do	2.	..do	238.8	16.0	12.9	.384	.288	.000	.12	.....
10447	..do.	..do.	Decided	Muddy	000	301.2	16.0	14.9	.428	.480	.002	.158	.....
14556	Chadwick	June 25, 1906	Slight	.2	000	417.0	3.05	.880	1.256	.000	.200	.413	.....
	Champaign—See table page 23.												
2027	Chicago	Mar. 20, 1897	..do.	.02	000	143.2	3.	1.8	.008	.060	.001	.2	.....
5370	..do.	July 10, 1897	.....	.....	.....	.....	.....	.....	.....	.....	.....	.56	.....
15376	..do.	Nov. 21, 1906	Decided	Muddy	000	3566.	2.0	.9	.688	.432	.006	.920	153.6
13497	Chillicothe	Sept. 5, 1905	Clear	.00	000	428.4	15.5	1.5	.052	.040	Trace	7.600	.....
10701	Chrisman	Oct, 13, 1902	Decided	Muddy	Musty	2287.6	565.5	6.2	1.60	.576	.000	.16	.....
10702	..do.	..do.	Slight	.1	..do.	596.4	42.0	3.9	.026	.11	.200	.44	.....
	Clinton—See page 26.												
4271	Collinsville	Oct. 28, 1898	Distinct	.03	000	2608.8	865.	4.7	.024	.044	.215	.40	.....
4280	..do.	..do.	Slight	.03	000	2544.8	680.0	3.3	1.000	.030	.210	.40	.....
10753	..do.	Nov. 10, 1902	Distinct.	.4	000	329.2		1.3	.048	.04	.000	.16	.....
14529	..do.	June 18, 1906	..do.	.3	000	405.0	5.0	1.8	.216	.116	.001	.038	298.8
14530	..do.	..do.	..do.	.2	000	464.0	5.5	2.05	.024	.136	.003	.877	337.0
12627	Creal Springs	Nov. 7, 1904	Decided	Yellow	000	340.0	12.0	11.2	.016	.032	.000	.24	.....
	Danville—see page 28												
	Decatur—see page 32												
3462	Dekalb	April 15, 1898	Slight	.02	000	296.4	.9	2.8	.080	.044	.012	.250	.....
3463	..do.	April 15, 1898	Distinct	.15	000	338.0	.8	3.4	.520	.046	.000	.140	.....
3464	..do.	April 15, 1898	..do.	.5	000	336.4	1.0	3.3	.60	.048	.000	.180	.....
11536	..do.	Oct. 27, 1903	Slight	.2	000	310.8	.....	2.6	.112	.036	.250	.030	.....
946	Dixon	June 4, 1896	..do.	.04	000	307.2	3.8	.5	.09	.046	.000	.100	.....
948	..do.	June 4, 1896	Distinct	.08	000	302.8	3.9	.3	.00	.035	.000	.100	.....
910	Dwight	May 27, 1896	Decided	Yellow	000	1034.8	34.0	4.6	2.30	.176	.000	.1	.....
911	..do.	May 27, 1896	None	000	000	988.0	33.0	3.8	2.2	.206	.200	.26	.....
9054	..do.	May 29, 1901	Decided	Yellow	000	1081.6	32.0	5.4	2.96	.126	.000	.08	.....
14337	..do.	May 8, 1906	V. decided	.6	000	1126.0	33.0	4.95	2.800	.136	.000	1.20	260.4
11801	E. St. Louis	Feb. 9, 1904	.....	.....	.....	196.0	5.8	9.3	.448	.192	.008	.672	.....
13939	..do.	Feb. 23, 1905	Decided	.1	4 Earthy	239.0	7.0	6.01	.160	.160	.016	.704	153.0
	Edwardsville—see table, page 37												
14084	Effingham	Mar. 7, 1906	Decided	Muddy	1 Earthy	327.0	4.5	5.8	.104	.280	.003	1.477	196.4
	Elgin—see page 39												
4349	Elmhurst	Nov. 8, 1908	Slight	.1	Musty	472.0	.8	2.0	.03	.048	.000	.35	.....
14890	..do.	Sept. 1, 1906	Distinct	.3	000	469.0	2.5	2.75	.304	.104	.001	.160	355.2
15403	..do.	Nov. 27, 1906	Slight	.1	000	472.0	3.0	2.55	.184	.040	.003	.160	359.0
12247	El Paso	July 18, 1904	Distinct	.8	Medicine	608.0	1.3	48.1	2.720	.222	.000	.04	.....
	Evanston—see page 46.												
1041	Farmer City	June 28, 1896	.....	.....	.....	719.2	119.	11.8	3.80	.158	.000	.116	.....
3686	..do.	Sept. 20, 1896	Slight	.03	000	252.0	2.9	2.6	.002	.072	.018	.880	.....
	Freeport—see table, page 52.												
	Galesburg—see table, page 53												
9171	Geneseo	July 12, 1901	.....	.....	.....	396.8	4.6	5.6	.088	.178	.001	.039	.....
15064	..do.	Sept. 24, 1906	Distinct	.0	3 Earthy	466.0	2.0	7.1	.016	.092	.000	.120	309.1

Sanitary Analysis of Waters from Illinois Cities—Final Table—Continued.

Serial number.	Town.	Date of collection.	Appearance.			Total residue on evaporation.	Chlorine.	Oxygen consumed.	Nitrogen as				Alkalinity.
									Ammonia.				
			Turbidity.	Color.	Odor.				Free.	Albuminoid.	Nitrites.	Nitrates	
15020	Genoa	Sept. 28, 1906	Clear.	.0	000	324.0	15.0	1.9	.16	.048	.000	.12	318.7
	Glencoe—see Winnetka—see page 111												
3948	Greenville	Aug. 13, 1898	Slight.	.02	000	554.8	24.0	1.1	.004	.01	.000	.800	.....
837	Havana	May 12, 1896	.....	.....	.....	178.4	2.4	.90	.002	.018	.005	1.6	.....
870	..do	May 19, 1896	.....	.....	.....	176.8	2.5	.3	.000	.032	.003	2	.....
14711	..do	Aug. 5, 1906	Clear.	.0	000	224.0	4.0	1.3	.026	.124	.001	.920	129.9
14712	..do	Aug. 5, 1906	..do.	.0	000	223.0	4.0	1.3	.156	.038	Trace.	.92	128.0
14893	Henry	Sept. 1, 1906	..do.	.0	000	2522.	1100.	8.15	.136	.106	.200	.360	299.5
	Jacksonville—see page 57												
3750	Jerseyville	June 27, 1898	Slight.	.01	000	2624.4	1070.0	6.5	1.08	.02	.021	.15	.....
	Joliet—see page 58												
	Kankakee—see page 60												
	Kewanee—see page 64												
10521	Knoxville	July 28, 1902	Clear.	Clear.	None.	1175.6	188.	5.5	1.44	.04	.008	.072	.....
14148	Lacon	Mar. 26, 1906	..do.	000	000	398.0	15.0	2.75	.016	.044	.000	4.40	271.6
	Lake Forest—see page 67												
	LaSalle—see page 69												
11949	Lewiston	April 6, 1904	..do.	000	000	314.8	5.3	1.1	.008	.030	.000	.76	.....
10680	Litchfield	Oct. 9, 1902	Slight.	000	000	922.8	147.0	4.7	.006	.06	.042	13.95	.....
13942	..do	Jan. 24, 1903	V. decided	Muddy.	4 Earthy.	463.0	1.5	.....	.....	.....	.....	.76	374.
747	Lockport	April 20, 1896	.....	.....	.....	240.	2.55	2.9	.....	.....	.06	.40	.....
748	..do	April 20, 1896	.....	.....	.....	1547.6	710.	3.5	.....	.....	.000	.86	.....
1747	..do	Dec. 17, 1896	Slight.	.1	000	1905.2	910.	5.4	.800	.018	.024	.12	.....
1796	..do	Jan. 5, 1897	Distinct.	.04	000	1932.4	930.	3.4	.800	.018	.010	.2	.....
10343	Maroa	April 2, 1902	.....	.....	.....	365.6	3.76	3.4	4.00	.148	.003	.077	.....
9956	Marshall	Dec. 3, 1901	Slight.	.01	000	.....	5.	1.6	.018	.022	.000	.56	.....
14566	Mascoutah	June 26, 1906	Decided.	.5	000	1023.	85.0	1.95	.576	.048	.001	.160	392.
	Mattoon—see table, page 72												
5633	Maywood	Aug. 14, 1896	Slight.	.05	000	597.2	4.20	1.1	.40	.026	.000	.16	.....
13578	Mendota	Sept. 20, 1905	..do.	.3	000	371.0	1.05	6.55	.016	.096	.000	1.36	.....

13579	. . do	Sept. 20,1905	Distinct . .	.6	000	351.0	1.2	7.15	.042	.124	.042	1.20	.....
4131	Metropolis	Sept. 26,1898	. . do	.1	000	130.4	10.0	3.3	.006	.128	.001	.25	.....
4132	. . do	Sept. 26,1898	. . do	.2	000	168.0	10.	4.5	.026	.224	.002	.2	.....
12614	. . do	Nov. 1,1904	. . do	.2	000	223.2	28.0	4.3	.012	.102	.000	.16	.....
3539	Minonk	May 3,1898	Slight	.02	000	2226.	980.0	5.2	.8	.036	.000	.40	.....
	Moline—see page 75												
14061	Momence	Feb. 26,1906	Decided . . .	.0	000	587.	1.4	2.8	.128	.120	.010	1.35	289.8
140	Morris	Nov. 2,1895	. . . . .	. . . . .	. . . . .	396.2	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
15267	. . do	Nov. 2,1906	Slight . . .	.0	000	394.	21.	1.7	.509	.038	.002	.2	307.2
	Morrison—See page 78.												
3561	Mound City	May 12,1898	Distinct . .	.03	000	417.2	160.	1.9	.36	.012	.000	.50	.....
8927	. . do	Dec. 28,1900	Slight	.01	000	258.4	66.00	2.6	.264	.034	.000	.04	.....
8991	. . do	Feb. 11,1901	V. Slight.	.1	Stale	263.6	67.	2.8	.264	.038	.000	.08	.....
12598	Mt. Morris	Aug. 25,1897	. . do	.02	000	400.4	28.	1.5	.000	.022	.000	10.76	.....
13373	Mt. Sterling	Feb. 22,1898	Distinct . . .	Muddy . .	Sour.	4076.4	1310.	466.8	.48	2.24	.002	.160	.....
13374	. . do	. . do.	Slight	.02	000	714.0	73.	2.5	.008	.084	.002	.21	.....
9648	. . do	Nov. 2,1901	Decided . . .	Yellow. .	000	1782.8	445.	7.3	.512	.128	.012	.148	.....
4288	Mount Vernon	Nov. 1,1898	Slight	.03	000	128.8	5.0	4.2	.088	.236	.003	.3	.....
15269	. . do	Oct. 29,1906	Decided . . .	.8	000	259.0	7.95	.304	.264	.030	.530	40.3	.....
15270	. . do	. . do.	. . do	.8	000	261.0	7.75	.528	.400	.034	.446	48.0	.....
10991	Moweaqua	April 11,1903	Slight	.1	000	4034.4	1420.	8.1	.008	.044	.000	3.2	.....
11771	Naperville	Jan. 28,1904	. . . . .	. . . . .	. . . . .	930.8	117.	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
14197	. . do	April 9,1906	Slight	.0	3Earthy. . .	690.0	43.2	2.2	.36	.056	.030	.20	378.0
8405	Neoga	Sept. 5,1900	V. Slight .	Muddy . .	000	672.4	203.	63.3	.038	.436	.006	.28	.....
13754	Normal	Nov. 20,1905	Decided . . .	. . . . .	Earthy	422.0	8.0	9.0	2.32	.166	.000	.16	396.
14681	N. Chicago	July 25,1906	Clear	.2	Musty.	191.	3.5	3.25	.096	.104	.006	.240	120.3
2150	Onarga	April 26,1897	Slight	.05	Moldy.	961.6	10.	5.1	.382	.122	.13	.84	.....
13946	. . do	Jan. 22,1906	Decided	.00	000	958.	7.5	3.4	1.84	.088	.000	.36	158.9
14431	Oregon	June 21,1906	Clear	.0	000	322.	6.0	1.2	.104	.028	.000	.12	294.
14432	. . do	. . do.	. . do	.2	000	323.0	5.5	1.1	.064	.040	.000	.20	240.
14433	. . do	. . do.	. . do	.0	000	312.	6.0	1.3	.114	.040	.001	.12	249.
	Ottawa—See page 82.												
55	Pana	. . . . .	. . . . .	. . . . .	. . . . .	315.2	5.0	.7	.24	.002	.000	. . . . .	.....
8632	. . do	Oct. 6,1900	Slight	Yellow . .	000	375.6	3.4	4.3	1.72	.144	.001	.078	.....
9063	. . do	April 8,1901	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	.24	.....
10642	. . do	Sept. 25,1902	Slight	.6	000	326.4	1.8	8.	.36	.034	.75	.00	.....
	Paris—See page 83.												
	Pekin—See page 84.												
	Peoria—See page 86.												
8871	Peotone	Dec. 6,1900	V. Slight .	.01	000	589.2	1.7	1.6	.208	.036	.000	.16	.....
10643	. . do	Sept. 25,1902	Clear	.00	000	593.2	1.7	1.8	.452	.050	.000	.04	.....
14535	Peru	Dec. 8,1906	Slight	.0	000	713.0	210.0	5.5	1.12	.032	.003	.200	313.0
14536	. . do	. . do.	. . do	.0	000	702.0	202.0	9.35	1.12	.040	.003	.200	314.9
10188	Polo	Jan. 16,1902	. . do	.04	000	322.0	2.	1.9	.112	.006	.000	.09	.....
10189	. . do	. . do.	Decided . . .	Yellow . .	000	530.4	5.3	5.4	1.7	.16	.003	.077	.....
	Pontiac—see table page 88.												
13974	Prohetstown	Feb. 6,1906	Slight	.0	000	308.0	8.0	2.9	.078	.090	.016	2.224	229.4
	Quincy—see page 90.												
3430	Rantoul	April 5,1898	Distinct . .	.25	000	334.8	.7	2.5	.52	.054	.000	.35	.....
10689	Riverside	Oct. 18,1902	V. Slight.	.1	000	647.2	29.75	2.6	.128	.66	.1	.06	.....

Sanitary Analysis of Waters from Illinois Cities—Final Table—Concluded.

Serial number.	Town.	Date of collection.	Appearance.			Total residue on evaporation.	Chlorine in chlorides.	Oxygen consumed.	Nitrogen as				Alkalinity.
			Turbidity.	Color.	Odor.				Ammonia.		Nitrites.	Nitrates.	
									Free.	Albuminoid.			
10691	. . do	. . do.	. . do.	.000	000	817.6	222.	2.5	.248	.04	.15	.17	.....
66	Rochelle	Oct. 7,1895	.....	.....	.....	549.2	37.	2.3	.028	.32	.02	7.98	.....
154	. . do	Nov. 4,1895	.....	.....	.....	540.6	37.5	.85	.04	.15	.01	7.	.....
11743	. . do	Jan. 12,1904	Clear	.00	000	325.6	2.15	1.4	.096	.018	.000	1.20	.....
	Rookford—see page 94.												
	Rock Island—see page 96.												
10225	Roger's Park	Jan. 29,1903	Slight. . . .	.01	000	150.4	3.2	4.8	.026	.080	.000	.24	.....
10238	. . do	Feb. 4,1903	V. Slight.	.00	000	140.4	3.2	3.5	.034	.078	.000	.2	.....
10272	. . do	Feb. 14,1903	. . do.	.01	000	155.6	3.6	2.6	.018	.068	.000	.23	.....
10304	. . do	Mar. 6,1903	Clear. . . .	.0	000	156.4	3.3	2.4	.028	.072	.000	.14	.....
10316	. . do	Mar. 15, 1903	. . do	.0	000	146.0	3.05	2.6	.070	.092	.003	.297	.....
12094	Roseville	May 30,1904	Slight	.1	000	1233.2	219.0	.....	.....	.....	.016	.040	.....
12793	. . do	Dec. 20,1904	.....	.....	.....	2810.	245.0	2.0	1.360	.040	.130	.070	.....
10421	Rushville	May 26,1902	Distinct. .	Muddy . .	Gassy	4284.8	1485.0	9.6	1.88	.04	.000	.08	.....
15119	Savanna	Oct. 12,1906	. . do.	. . do	. . do.	313.	6.0	1.45	.036	.066	.000	.200	.....
5144	Shelbyville	June 1,1899	Decided . .	Yellow . .	000	574.0	14.2	1.5	.240	.034	.000	.04	.....
7854	. . do	July 6,1900	. . do.	Muddy . .	000	.....	6.8	29.5	.164	1.52	.003	.681	.....
10602	. . do	Sept. 8,1902	.....	.....	.....	329.2	5.3	7.9	.032	.062	.001	.16	.....
10648	. . do	Sept 29,1902	Distinct . .	.0	000	344.0	6.2	3.	.064	04	.004	.236	.....
10649	. . do	. . do.	Slight	.2	Wood	330.4	6.2	4.2	.064	.056	.000	.24	.....
4867	Sheldon	Mar. 27,1899	. . do	.02	000	794.0	320.	3.3	.52	.328	.000	.15	.....
4922	. . do	Mar. 14,1900	Distinct . .	.03	000	788.0	320.	2.3	.4	.034	.000	.1	.....
	Springfield—see page 102.												
10835	Staunton	Jan. 2,1903	Decided . . .	Black . . .	Vinegar . . .	600.4	6.1	37.3	.56	.032	.003	.56	.....
13951	. . do	Jan. 28,1906	. . do	.6	000	362.	6.5	2.15	.360	.110	.001	.56	.....
	Streator—See page 103.												
1772	Tolono	Dec. 28,1896	Distinct . .	1.2	000	618.0	5.5	15.5	7.0	.302	.000	.056	.....
15459	. . do	Dec. 17,1906	Decided . . .	Yellow . .	2Earthy . . .	636.0	5.0	15.10	7.20	.312	.000	.48	588.1
	Upper Alton—see page 107.												
	Urbana— see page 108.												

176	Warren	Nov. 8,1895	....	....	....	354.8	3.45	.25	.004	.024	.015	.24	....
15443	Watseka	Dec. 10,1906	Clear.....	.2	000	343.	....	2.28	.094	.004	....	....	257.7
12490	.. do.	Sept. 24,1904	None.....	.0	Earthy....	352.8	12.	3.	.048	.058	.000	.36	....
	Waukegan—See page 109.												
2370	West Chicago	June 23,1897	Slight....	.05	000	333.2	10.	.1	4.4	.052	.000	.06	....
12236	.. do.	July 14,1904	Distinct...	.6	000	407.2	14.8	1.3	3.52	.042	.000	.08	....
2474	.. do.	July 21,1897	.. do......	.06	000	354.	10.	1.8	.56	.034	.000	.06	....
13610	White Hall	Sept. 28,1905	Decided..	1.0	000	139.	2.30	1.8	.120	.242	.000	.16	....
15279	.. do.	Oct. 31,1906	.. do......	.6	Musty.....	154.	2.0	8.75	.208	.440	.000	.160	105.6
15469	.. do.	Dec. 18,1906	.. do......	.5	000	167.	2.0	6.85	.040	.208	.000	.40	91.1
	Winnetka—See page 111.												
10723	Wyoming	Oct. 6,1902	Distinct...	.2	000	815.6	144.0	4.1	1.44	.094	.000	.12	....

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