A QUANTITATIVE AND STATISTICAL STUDY OF THE PLANKTON OF THE SAN JOAQUIN RIVER AND ITS TRIBUTARIES IN AND NEAR STOCKTON, CALIFORNIA, IN 1913

BY

WINFRED EMORY ALLEN

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INTRODUCTION

The biology of fresh water is an attractive field for investigation both from the standpoint of ecology and from that of its practical bearings on the problems of fisheries. The fresh water plankton with its varying components forms a biological complex, or association of both plant and animal forms which have an intimate relation not only each to the others, but also to the varying factors of their environment, such as light, temperature, organic and inorganic substances in solution, and to seasonal change attendant upon the run-off from the watershed.

The survey of San Francisco Bay undertaken by the United States Bureau of Fisheries in 1912–13 in coöperation with the University of California afforded an opportunity to initiate a survey of the plankton of the San Joaquin River, one of the principal tributaries of that bay. My position at Stockton as teacher of biology in the High School afforded some laboratory facilities and also a location near the head of tidewater where the ultimate contributions of the stream of the bay could be examined and where a variety of conditions were present, including both the main channel, and backwaters with varying rates of flow, as well as a canal much enriched by sewage.

The author is conscious not only of the serious and baffling difficulties that attend such an attempt at a continuous piece of work but also of the errors which inevitably creep in, especially in the initial stages of such an enterprise. These errors are, however, in the main, distributed throughout the data and do not necessarily invalidate our conclusions. Such errors as occur in taxonomy are due to lack of the specialist's knowledge of nomenclature and synonymy, and of his critical skill in the finer distinctions of species and subspecies. The species as I have recorded them are at least groups of recognizably similar organisms. The largest source of significant error in this ecological study is the not improbable inclusion in such groups, of small numbers of less abundant or rare species of closely similar form.

ACKNOWLEDGMENTS

This investigation owes its origin to the committee in charge of the survey of San Francisco Bay, of which Professor Charles A. Kofoid, is chairman, and was undertaken under the auspices of the United States Bureau of Fisheries, to which I am indebted for equipment of nets and supplies.

Both Dr. F. B. Sumner and Waldo K. Schmitt, successive naturalists of the United States Steamship ''Albatross,'' have lent their encouragement to my efforts and have also titrated some water samples. For literature, or assistance in securing it, sincerest thanks are hereby given to Professor S. A. Forbes, of the Illinois State Laboratory of Natural History, to the Michigan State Fish Commission, to Professor H. W. Conn of Connecticut, to Professor H. B. Ward of the University of Illinois, to Dr. Vincente Izquierdo of Santiago, Chile, to the United States Geological Survey, to the Chief of Engineers of the United States War Department, to Professor F. E. Clements of the University of Minnesota, to Dr. William F. Allen of the University of Minnesota, and to the Library of the University of Minnesota, to Dr. C. Dwight Marsh of the United States Bureau of Plant Industry, to Mr. H. K. Harring of the United States Bureau of Standards, to Professor C. J. Elmore, Grand Island, Nebraska, to Dr. B. W. Evermann of the California Academy of Science, to Professor E. A. Birge of the University of Wisconsin, and to Professor C. A. Kofoid of the University of California.

Dr. Marsh and Mr. Harring have also very kindly made some identifications of copepods and rotifers. Very material aid has been given by Mr. E. P. Higby of the California State Hospital at Stockton, who has given full use of his weather records, and to Mr. Lawrence Backes of Stockton for photographic views of the stations. Above all it should be said that whatever value there may be in the present paper is largely dependent upon the advice, encouragement and assistance of Professor C. A. Kofoid; and upon the painstaking care with which Mrs. W. E. Allen has computed, recorded and preserved most of the data as they came to hand. Inasmuch as Professor Kofoid's report on the Illinois River has been in constant use for reference and guidance it has been used liberally for suggestive outline of discussion. Many of its generalizations and conclusions are assumed

as applying here, but some points will receive special notice for the purpose of comparing conditions there and here when the data will permit.*

GENERAL FEATURES OF THE SAN JOAQUIN RIVER BASIN

The writer has not yet had sufficient opportunity to collect detailed information on this topic. The California report by Clapp and Henshaw (1909), to the United States Geological Survey, upon the surface water supply gives an excellent discussion of the most important features and it forms the main basis for this present brief discussion.

GENERAL CHARACTERISTICS

Two points of difference from the typical river basin in its latitude are interesting characteristics of the San Joaquin. First, its drainage is northwestward away from the equator. Second, it consists throughout of a rather deep trough with comparatively abrupt sides and unusually flat bottom, the level of which is repeatedly broken by the deltas of tributaries entering in most cases very nearly at right angles. The land surface varies markedly in character with the differences in these tributaries, but with a constant tendency to the formation of swamps and marshes at the lower points through the deposit of the lighter organic matter not left in the tributary deltas. This condition is very prominent from some distance above Stockton on to the mouth of the river. Stockton itself is on the eastern border of an area of swampy peat land through which the course of the river can be maintained only by extensive systems of levees. Even then great stretches of the lower levels are inundated each year, and Stockton has the perennial problem of escaping from floods.

It is quite evident from the foregoing that the lower valley as a whole is fertile, with a deep soil of good texture. The lower part is fairly well settled but there is as yet no adequate control of the water supply and an extensive area is practically undeveloped. The few cities are small and far apart. None of them is so situated as to cause any appreciable contamination of the river water near Stockton. The whole basin is under the direct influence of the "dry" and "wet" seasons. With its low levels, this results in sluggish, almost stagnant flow of the main river during the first, and a brisk flow during the run-off of flood waters incident to the second.

* This paper is published by permission of Dr. H. M. Smith, commissioner of the United States Bureau of Fisheries.

Location

SIMILAR GEOGRAPHIC LOCALITIES

The San Joaquin River lies in about the same latitude as the larger part of the Mediterranean Sea, the headwaters of the Tigris and Euphrates, and a considerable portion of the Hoang Ho, both of headwaters and lower reaches. It extends northwest from about 35° to 38° N. latitude between 118° and 122° W. longitude. The main basin lies on the isotherm of 60° F. Similar average temperature conditions are found in the Potomac region of the United States, along the northern border of the Mediterranean Sea and in north central China near the coast. Stockton lies in latitude 37° 57′ 30″ N., longitude 121° 17′ 30″ W. and on isotherm 60° (15.5° C). The altitude at the steamer landing in mid-city is sixteen feet, according to Mr. A. L. Miner, assistant city engineer.

GEOGRAPHIC AREAS OF MIDDLE CALIFORNIA

The part of California containing the San Joaquin system is a region of great diversity, but it is quite distinctly composed of three parallel strips of country. There is the Coast Range at or near the western border of the state, the central plain known as the San Joaquin Valley, and the Sierra on the eastern border. The part with which we are immediately concerned is comprised in the eastern slopes of the Coast Range, 4,000 square miles, the valley, 12,700 square miles, and the western slopes of the Sierra, 16,000 square miles. The range of altitude is from near sea level in the lower valley through some hundreds and thousands of feet in the Coast Range and the Sierra foothills up to over 14,000 feet in the High Sierra. The gradient is slight lengthwise of the valley, very steep, commonly twenty to forty feet to a mile, to the Coast Range, and generally moderate to the Sierra, averaging nearly five feet to a mile.

SIZE AND FORM OF SAN JOAQUIN DRAINAGE AREA

The total length of the San Joaquin River is near 350 miles, 125 miles from the High Sierra to the main valley and 225 miles thence to the outlet into Suisun bay, 50 miles from San Francisco. All the important tributaries are from the Sierra slopes, which consist mainly of granites and metamorphic rocks, sedimentary and igneous. The slopes of the other side are mostly sandstone, shale and conglomerates.

The differences in gradient partly cause an asymmetery of the valley floor which is made prominent by the differences of the streams on the two sides. Since the streams on the east side are larger, they have built larger deltas with a wider spread as they cross the lighter, longer slopes. Deltas from the two sides have united across the valley, cutting off the Tulare basin. For this reason water from the large streams at the head of the valley does not reach the San Joaquin River, except in years of unusual rainfall. Thus about one-fourth of the main basin is practically separated from the rest and this southern area rarely has any influence on northern conditions.

FOREST AREAS

There is no important forest cover in the main valley. Some of the higher ground in the Coast Range bears shrubbery and light timber. The Sierra foothills are usually well covered with grass, brush and scattering trees. Above the foothills is heavy timber to 10,000 feet, above which none occurs. The famous Sequoias occur in this region. National forests occupy about 65 per cent of the Sierra slopes.

RAINFALL

The annual rainfall varies from five to twenty inches from south to north along the valley. The west slope has light rainfall with similar increase northwest. The Sierra slopes show heavier precipitation according to altitude, but with similar increase to northward.

IMPORTANT TRIBUTARIES OF SAN JOAQUIN DRAINAGE AREA

In addition to the foregoing consideration of the main river and the basin as a whole it is worth while to include some points concerning three or four of the principal tributaries which may have some recognizable influence at Stockton.

THE KINGS RIVER

The King's River is the most southerly tributary that has any ordinary connection with the San Joaquin. Its relation is rather peculiar since its delta forms a large part of the barrier cutting off the Tulare Lake Basin from the main valley. This delta has been built in such a way as to carry the entire flow of the Kings River to the San Joaquin during low water, but most of the flood waters go to Tulare Lake. The altitude near the entrance of the San Joaquin is about 175 feet according to Clapp and Henshaw (1911).

King's River basin has fifty miles of Sierra divide as its eastern border, with some altitudes above 14,000 feet. Its length is about sixty miles in the mountains, with an area approximating 1,840 square miles. The river source consists of many little glacial lakes at the edge of glaciers and perpetual snow. The length of the river to the mouth of its cañon is nearly 85 miles.

The basin as a whole is very rough and irregular, the head especially including the most rugged region in the Sierra. Nearly all the tributaries run through glacial cañons cut through solid granite. Several of the latter are 2,000 or 3,000 feet deep. The whole formation is granitic.

The larger part of the basin is well forested up to 10,000 feet Most of it is in the National Forest Reserve. Precipitation ranges from eight to ten inches in the San Joaquin Valley to fifty or sixty inches in the high altitudes. Most of the precipitation of this basin is in the form of snow.

The Merced River

The Merced River drains an area sixty-five miles in length from Mount Lyell on the Sierra divide (13,090 feet) down to the San Joaquin River. This includes a total of 1,200 square miles. The river itself is about 135 miles in length, with four or five tributaries of some importance, including the famous Yosemite Creek. Though the Yosemite Valley is the most remarkable, there are other parts of the basin very rough and broken, with many waterfalls and glaciated regions. About 850 square miles of the upper part of the basin is included in national forests, though there is little growth above 12,000 feet. The annual precipitation in the San Joaquin Valley near the mouth of the Merced sixty or seventy miles from Stockton, is ten to fifteen inches and it ranges through twenty-five inches in the foothills to about sixty inches near the divide. Even in the mountains this precipitation occurs mainly in the rainy season, mostly as snow, the melting of which is most rapid in May and June.

The Tuolumne River

The Tuolumne River traverses a basin 105 miles long, two-thirds of which is in the mountains. The mountainous portion is about 1,680 square miles in area. This river is 150 miles long, about 80 miles of which is through a deep cañon cut down into solid granite. This cañon drains numerous glacial lakes at the Sierra divide, and the upland meadows slightly lower down. The basin as a whole is very rough, with bare, glaciated rocks of granite in the upper parts. Altitudes vary from 300 feet in the foothills to 12,000 or 13,000 feet at the divide. Upper parts have no forests, but there is a median belt heavily forested with coniferous trees. The lower region has only grass and brush, usually. There is about 1,200 square miles of National Forest in the mountains. Precipitation is about ten inches per annum in the region near the junction with the San Joaquin, 25 or 30 miles from Stockton. It ranges to sixty inches at high altitudes where most is snow, the greater part of which disappears in spring.

The Stanislaus River

The Stanislaus River has a long, narrow basin, about 75 miles in length and an area of somewhat over 950 square miles. The length of the river is about 120 miles, 80 miles in the mountains. The source is mainly in glacial lakes about the divide and the mouth is about 20 miles above Stockton. The general character of the basin is quite similar to that of the Tuolumne.

The Calaveras River

The Calaveras River flows near Stockton and empties six or seven miles below the city. It has some influence in flood season on account of the overflow, but in this case its influence would be much the same as that of those already mentioned since the flood waters of all are essentially similar. Furthermore, the flood waters of the Calaveras are largely kept from the San Joaquin above Stockton by an enormous levee forming the so-called ''diverting canal.''

TURBIDITY

The turbidity of the water of the San Joaquin in the vicinity of Stockton at all times of the year is very characteristic. In the river channel this is obviously due to fine silt during the flood season but the plankton is the principal source in the sluggish water of late fall. Water in some of the sloughs sometimes becomes clear enough to reveal objects at a depth of six or eight feet.

RIVER CONDITIONS NEAR STOCKTON

Relation of Stockton to Tidewater

In this connection it is doubtless worth while to reconsider the points already mentioned which have most obvious relation to Stockton conditions. First, we may emphasize the fact of the low gradient. Since the steamer landing at Stockton is only sixteen feet above sea level the water level must be only about eight feet above sea level for a considerable part of each year. Stockton is about one hundred miles from the Golden Gate, so the gradient to the sea is only about 0.08 foot to the mile. This must account in large measure for the range of the tide, which sometimes shows a difference of something over three feet between high and low water in Stockton Channel.

River Gradient Above Stockton

In the other direction, we find a rise to one hundred and seventy-five feet above sea level at the mouth of Kings River, probably about two hundred miles above Stockton. Assuming this distance as an approximation, we find the gradient above Stockton to average a little more than 0.8 foot to the mile. As might be expected from such a low gradient, there is a great deal of swamp land throughout the distance. Formerly there was annual flooding of this low area during the wet season, with a good deal of deposit of silt and stirring up of organic matter, much of which came from the death of plants and animals in the preceding dry season. The definite limitation and constant alternation of dry and wet seasons, together with the proximity of the mountains, must have had a very marked influence on plankton production in the low lands under such conditions.

OPPORTUNITIES FOR PLANKTON DEVELOPMENT

Recently more and more of these low lands have been reclaimed and protected by levees. The run-off is thus materially hastened in flood season and there is much less opportunity for plankton development than Kofoid has found for the Illinois River. There is also the further consideration that most cases in which impounding of the water occurs, show rapid evaporation after river subsidence, with great destruction of organisms before they have opportunity to get into the river channel. Unfortunately, definite information as to areas still open and details of their seasonal history are not available.

At any rate, it seems that one explanation of the apparent numerical deficiency in plankton production as compared with the Illinois may be that there is less impounded water ready to develop and discharge plankton, and that there are no frequently occurring minor floods to wash out these areas. It should be stated, however, that 1913 was an unusually dry year; hence the flood conditions were not typical for this region.

Effect of the Mountains

The mountains probably have just as much influence on plankton in the river as does the character of the bottom lands. The Coast Range has no very extensive influence. In the main it is rather against plankton production. The slopes are steep and the run-off torrential during the heavy rains. There are not many natural reservoirs such as either swamps or lakes, and the surface water is soon lost. Consequently very little plankton is contributed to the San Joaquin from these western tributaries. In fact most of them are dry through a large part of the year and the water they contribute in time of flood is so full of silt as to hamper rather than hinder plankton production in the main river.

Temperature

The Sierra Nevada seems to affect production in two rather important ways. First, temperature in their run-off is rather low for either quantity or variety of plankton in the higher areas during most of the year. On the other hand, there are few places for impounding the water in the lower areas and the streams move too rapidly for much development even on the comparatively low gradients of the foothills. Hence there is no very great contribution of plankton from any tributary. Second, the snows, glaciers, forests, lakes and swamps of the higher region all together constitute an enormous series of reservoirs which hold much of the water in check, not only greatly prolonging the flood season, but giving a remarkably even distribution of flood water over a period of weeks or even months. The effect of this is evidently twofold, inasmuch as the volume of water hastens the flow of the river and so may retard production, while at the same time it keeps many of the sloughs and swamps sufficiently filled to maintain a rapid plankton output. This period of flood from the Sierra often overlaps the period of floods in the valley due to the winter rains. In other cases it follows or is continuous with the same. Hence there are a few rises and subsidences of the floods, almost every year, some of which are effective in clearing out the sloughs and giving basis for a new plankton crop. The combined flood periods usually extend from late December to about July, after which there is gradual subsidence to the low-water conditions of sluggish flow and partial stagnation. It should be said that the term "flood" is here used to include all stages of water at Stockton which are high enough to keep a distinct current in the river.

The mean annual temperature of the valley, stated as 15.5° C, does not give a very good idea of the real conditions at Stockton. For one thing, the range in temperature in every twenty-four hours is considerable throughout the year. The nights are almost invariably cool even in late summer and by far the larger number of days become quite warm. The average range for the year is about 8° C and is about 3° C in winter and 12° C in summer. On the other hand, the seasonal range is not so very great. Very rarely a high temperature near 40° C is reached in summer and a low temperature of about —10° C in winter. On the whole, there is good reason for thinking that temperature fluctuations in the San Joaquin River Basin have less influence than some other conditions on the general plankton production.

Light

Of course the fluctuations in available light are of great importance. These fluctuations are dependent on a number of conditions, such as the seasonal changes in length of days, turbidity of the water, cloudiness, and agitation by wind. All these influences are most adverse during the winter months, coincident with adverse temperature, so that it is almost impossible to prove which is most responsible for scarcity of plankton at that time.

As already stated, the turbidity of the waters in the Stockton region is very great and fairly constant. During the greater part of the first six months of the year this is evidently due mainly to very fine silt. During the rest of the year the high organic content seems to have some influence. Although the net with its brass parts was a rather conspicuous object in clear water, it was never visible one meter below the surface at any station. There are, however, no data available for accurate determination or comparison of turbidity.

Air Currents

Since Stockton is in a low region adjacent to extensive swamp areas and waterways, it is considerably affected by fog and clouds. The exclusion of light from this cause is quite important in the course of the year. Being located almost opposite the Golden Gate, this region is also under almost daily influence of distinct air currents. These are very frequently strong enough to make the water surface quite rough and there is scarcely a day that it is not made ripply for some hours. This also causes important loss of light throughout the year.

Chemical Conditions Not Studied

No definite data are available as to the chemical composition of San Joaquin waters. Hence discussion of this important factor must be deferred.

Tide

The ocean tide is very much in evidence at Stockton, but the available data are not adapted to satisfactory study. The extreme range is about three feet, but that does not occur very often. The only local records were those from a private tide-guage kept by Dixon Brothers Transportation Company. These records were made very irregularly in connection with the movement of their barges and cannot be used with much confidence in this discussion.

Aquatic and Marginal Vegetation

No definite study has been made of the aquatic and marginal vegetation of this section. The ocasional dredging of all larger waterways has kept down such growths in the places most accessible locally. Hence the following list must be regarded as incomplete. It is certainly inadequate so far as the typical delta flora is concerned.

Chara sp. occurs abundantly in some of the ditches and narrow waterways. It has not been observed in the river or in the larger canals, possibly because of the dredging. Where found it furnishes extensive lodging places for myriads of microscopic animals and plants.

Duckweeds, probably *Lemna gibba* L. and *Lemna minor* L., are very conspicuous in the fall in quiet nooks and ditches.

Typha latifolia L. is very abundant in a few places and is frequently found in small groups along any water margins.

Alisma plantago L. is said to be common.

Sagittaria is common and three species at least occur in this region. Apparently *S. latifolia Willd* is most frequent, though *S. greggii* J. G. Smith, and *S. sanfordii* Greene are more characteristic of the locality.

Urtica holosericea Nutt. is very abundant on most undisturbed levees and water margins.

Jussiaea californica fills some quiet sloughs and canals with an almost impenetrable mass of stems.

Scirpus lacustris L., is by far the most conspicuous plant in the marshes and shallow waters from one end of the valley to the other.

Carex marcida Boott. covers large areas of ground where the soil remains saturated though not completely submerged through most of the year.

Anemopsis californica Hook. occurs in temporary marshes and is peculiar to the rainy season.

The most abundant willows are *Salix nigra* Marsh., *S. lasiolepis* Benth., and *S. fluviatilis* Nutt. Although abundant by natural propagation, they are frequently planted along the levees to help to hold the dirt in place.

Populus fremonti Wats. is common along the water courses, but not abundant.

Rumex salicifolius Wats. is conspicuous in marshy ground, especially in the heavy loam and peat soils. *R. occidentalis* Wats. and *R. Crispus* are also prominent.

Polygonum amphibium L. occurs in the ditches and narrow waterways. So far as observed, it furnishes remarkably good shelter for minute animals and plants.

Ranunculus aquatilis L. is exceedingly abundant in small areas at times, forming dense mats in shallow water.

Nasturtium officinalis is reported as common, but it has not been observed by the present writer.

THE COLLECTING STATIONS

Three collecting stations were used. Plate 20 Station I was located in Stockton Channel at the foot of Yosemite street. This is about one mile and three-quarters from the river; four hundred yards from Mormon Channel outlet and three-fourths of a mile from the steamer landing at the head of Stockton Channel. There was a good deal of sewage coming down this channel. Mormon Channel was an open cesspool during most of the year. Hence this station seemed to be fairly typical for the study of organisms in dilute sewage.

Station II was in the river, from four hundred to eight hundred yards above Stockton Channel, and it represented as nearly natural river conditions as could be found in this section.

Station III was in Smith Canal about four hundred yards from the river. There was a small amount of sewage coming down this canal from the outskirts of the city. There was also a small slough about one hundred yards from the place of collecting. The general similarity to river conditions was well marked.

Station IV was not used in this series.

Stockton Channel and Smith Canal are more subject to disturbance by prevailing winds than is the river. Smith Canal being shallowest, Station III was probably most affected.

Stockton Channel was vastly more disturbed by river traffic than either of the other stations. Smith Canal was rarely affected in this way. Station II, in the river, was probably not stirred up one-tenth as much as Station I.

The turbidity of the water was least at Station III during 1913, and greatest at Station II. But Station III was never clear and the turbidity was not much less than at Station I.

Since the times of taking the temperatures at the various stations varied by an hour or more, an accurate comparison is impossible. The observer, however, always expected to find the highest temperatures at Station I, and the lowest at Station II and something between these at Station III.

There was no vegetation of consequence near Station I, but the levees were heavily covered at both the others. No aquatic vegetation occurs at any of the stations.

River Currents and Depths

Tidal currents were sometimes very noticeable at all the stations, but strong currents of any sort were very rare except at Station II, where they were noticeable for several months during the spring and early summer. The highest estimate placed on the rate of the river current in 1913 was four miles per hour. River transportation men, notably Captain Curry of the Island Transportation Company, say that five miles per hour is often reached during the heavier floods.

The least depth of water noted at the stations at low tide was about one and one-half meters at Station I, two and one-half meters at Station II and one meter at Station III.

Comparison of Stations

The general form of the three channels is somewhat different. The bed in all cases seems to be a clay with variable superimposed ooze. Stockton Channel is a straight canal ending blindly at the steamer landing, two and one-fourth miles from the river. It is nearly the same width throughout, probably two hundred feet on the average.

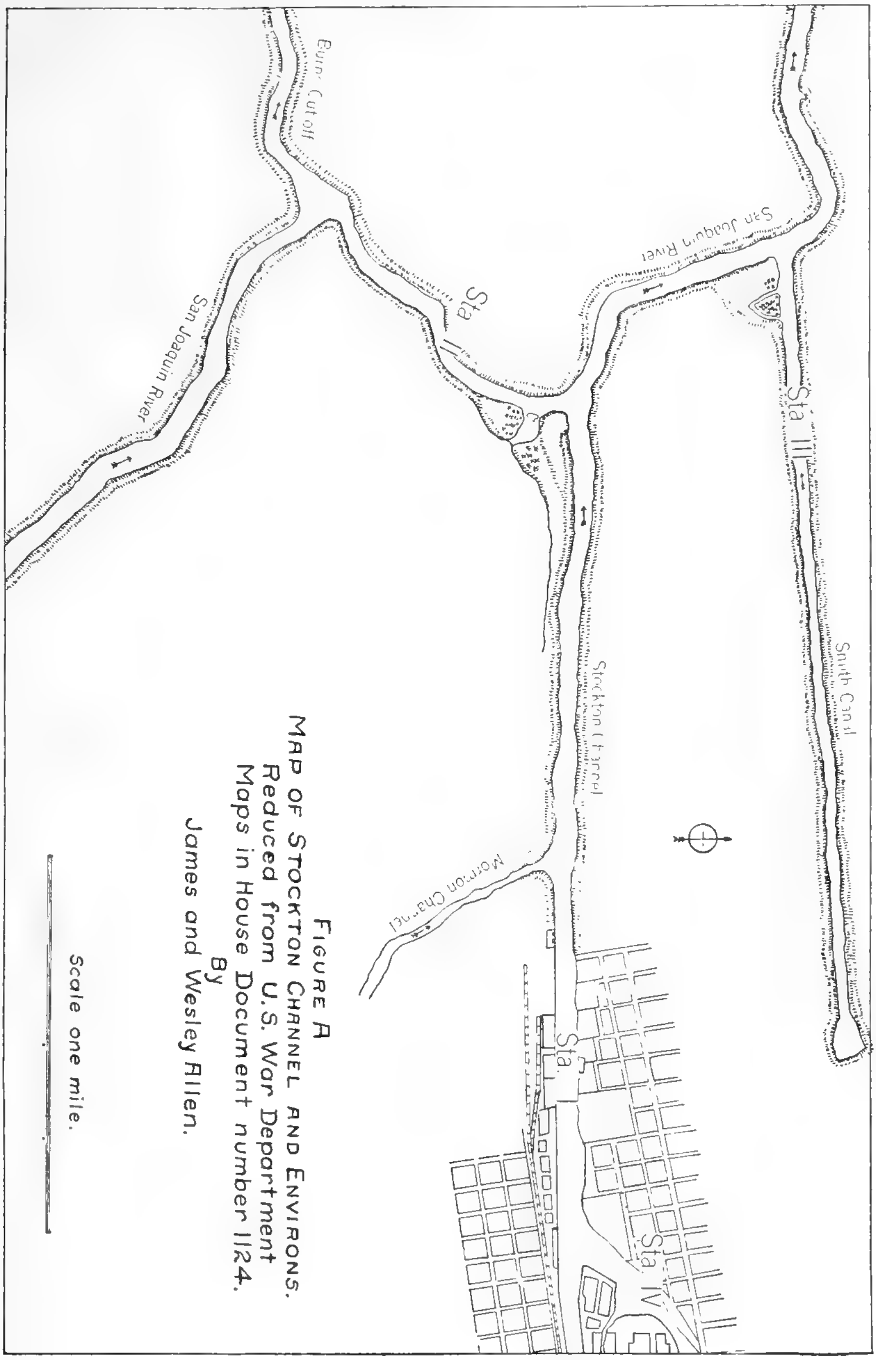
Burns Cutoff
San Joaquin River
San Joaquin River
Sta II
Sta III
Stockton Channel
Smith Canal
Mormon Channel
Sta I
Sta IV
FIGURE A
MAP OF STOCKTON CHANNEL AND ENVIRONS.
Reduced from U.S. War Department
Maps in House Document number 1124.
By
James and Wesley Allen.
Scale one mile.

Fig. A

Its flow is westward. Mormon Channel empties into it about half way up on the south side. Miner Channel, after traversing the city as an open ditch, empties into it through McLeod's Lake about three hundred yards from the steamer landing. McLeod's Lake is merely a broad slough some four hundred yards in length. It was almost filled with arks and boat houses during 1913. All sorts of rubbish and refuse were dumped into Miner Channel and McLeod's Lake at that time, including some sewage from factory drains and some refuse from the tannery.

The river channel is very crooked. The general direction is northeast for about one mile above Station II. At Station II it is nearly east, but within another half mile it has turned to the west. The width is kept fairly uniform by dredging and it probably averages one hundred and twenty feet near the station.

Smith Canal is a straight channel about sixty feet wide and two miles long, ending abruptly at the northwest city limits. An open ditch across the northern edge of the city carried waste water from certain gas wells and some sewage directly into its upper end, during most of 1913. This ditch was also partly filled with rubbish and garbage.

METHODS OF SECURING DATA

Time of Collecting

Most of the collections at Stations II and III were taken at seven-day intervals, at week ends. There was occasional variation of a day or two. Collections at Station I were made twice a week. The mid-week collection was usually on Wednesday. In a few cases there was a change of a day or two in the interval, but there was no failure to make two collections in any week.

One series of daily collections was taken in Stockton Channel for one month in July and August. Another series of hourly collections was taken for twelve hours in Smith Canal about one mile from the river. The plankton content was slightly different from that of the regular station in Smith Canal, but this was not realized at the time the series was being taken. The difference is not great enough to prevent instructive comparison.

The time of day at which collections were taken was very variable. Most of the midweek collections were taken after school in the late afternoon. Most of the week end collections at all stations were taken in the forenoon.

The Form of Net

The first few collections in January were obtained with a temporary net made of used mill silk. But a net, of number 25 new bolting silk, was put into use on January 15, 1913, and was used continuously to January 1, 1915. There were occasional changes of drain cups.

The net was constructed after a plan suggested by Professor C. A. Kofoid. Outspread, its general form is that of a very broad and short truncated cone, the base having a total circumference of 166.65 centimeters and the apex 17.59 centimeters. The slant length is 60 centimeters. In order to avoid the awkwardness of such a shape, eight equal folds are made lengthwise and their upper edges closed. The inner points of the folds are then fastened directly to a brass ring of proper size. The outer points of the folds and an unfolded part between each two is bound by butcher's linen to a slightly conical brass plate with an opening in the middle which will pass just 10,000 cubic centimeters of water for each meter hauled, i.e., 100 square centimeters area. The convex surface of this subconical plate is kept outermost, so that in hauling the water may all pass away from the opening, except that which is in the column immediately before it.

A small brass cylinder is fitted into the small end of the net and fastened there by butcher's linen. Smooth grooves on the outer surface of the cylinder, near each end, serve for securing it to the net as well as for attaching the drain cup to the distal end.

This drain cup is made of the same silk as the net. It is a very simple pocket, about 5 centimeters deep, made of two semicircular pieces sewed together by the circular edges. The straight edges thus form the top of the cup, just large enough to slip over the end of the brass cylinder. The size was not kept quite uniform but the filtering surface of this cup averaged about 100 square centimeters in 1913. A draw string of white tape is run around the margin of the cup and fastened by a small hook and eye, such as is used by dressmakers. The draw string makes it possible to slip the cup over the cylinder end without tearing. The hook and eye, when properly adjusted, makes a very secure fastening, easily and quickly opened or closed.

The total net surface before shrinkage was 5,527.20 square centimeters, not including the drain cup. The total filtration opening as calculated from micrometer measurements was 690.9 square centimeters. This gives a filtration outlet somewhat more than six times the area of the inlet to the net. Before using, the net was placed in warm, soapy water and gently rinsed in order to induce uniform shrinkage.

The drain cup was removed after each haul and the contents washed off into a small pail. Some organisms clung very tenaciously to the net and vessels. This was especially true of the stentors and some rotifers. The water in the pail was strained through a silk cup at the end of the collection.

The Amount of Haul

The standard collection covered an aggregate haul of twenty-five meters. Sometimes it was not possible to make a full collection. On a few occasions the light was too poor to make a full midweek collection. At these times it was usually possible to take half the usual haul. On still fewer occasions the silt clogged the net so badly in the river that only about one-fifth of a standard collection was taken. Even so it seemed that the net would surely break before it drained. Drainage of the net was always hastened by shaking the net slightly or by working it with the fingers.

Most hauls at Station I were at the depth of three meters; at Station II, four meters, and at Station III, two meters. Sometimes five meters could be taken at Station II. On the other hand there were times when only one meter could be taken at Station III. Most hauls in the river were taken while drifting. Most hauls in Stockton Channel and Smith Canal were taken while at anchor. Except on one occasion all hauls were made by the same person. The net was always hauled as nearly as possible at such a speed that it would just fail to throw water from its mouth as it broke the surface. This was about one-half meter per second. All hauls were as nearly vertical as possible. No particular effort was made to get in midstream at any time. In fact some collections were taken near the bank because of deeper water there. A few collections were taken from boat landings when the writer's motor boat was not in working order.

Records

Records were kept of the temperature of air and water at each station. The air temperature was taken first and it was always taken in the shade without much motion. The water temperature was taken by holding the bulb from one to three inches below the surface of the water and reading while in that position. Temperature was forgotten once during the year and on a few occasions it was taken at some distance from the point of collection. This was usually when there was a high wind that made any appreciable variation improbable.

The condition of the tide was recorded when it could be detected. Dixon Brothers' *Tide Record* is of some value for comparison, but it is so fragmentary that it cannot be depended upon. Corrections for this locality from the United States *Tide Tables* are of some value.

Records were kept of cloudiness, rain, fog, wind, roughness of the water, etc., at the time collections were being taken.

The hour and minute of collection was regularly recorded, usually at beginning and end.

Preservation of Materials

The collections were preserved in formalin in four-ounce, cork-stoppered bottles of the so-called vaselinetype. The formalin was not measured accurately, but it was intended to be from 6 to 10 per cent. The stronger solutions were used for the heavier collections. The formalin for one collection was forgotten until two days after it was taken, but so far as known that is the only serious error. The total number of collections during 1913 is 242. The year 1913 was very dry with very little flood water at any station. On the contrary, the water was unusually low much of the time. For this reason it would not show the local plankton range and distribution most typically. But there were some features strikingly similar to river conditions in other parts of the world, and it will make a good basis of comparison with 1914 which was a wet year.

Tests of Salinity

In spite of the low water it is not at all probable that sea water ever had any influence here except in causing tides. Surface samples of San Joaquin River water were taken at Station II at about the twentieth of each month. These samples were titrated for chlorine content by the scientific staff of the U. S. S. "Albatross" and their report is presented herewith. It is given in parts of chlorine per 1000.

Jan. 19	0.0280	July 19	0.0800
Feb. 19	0.0745	Aug. 21	0.0964
Mar. 29	0.1025	Sept. 21	0.1764
Apr. 26	0.1680	Oct. 19	0.2352
May 24	0.0032	Nov. 22	0.6600
June 21	0.0072	Dec. 20	0.1404

The most probable explanation of the variation shown is that the incoming tide carried some of the polluted Stockton Channel water up stream when the natural stream flow was very weak. No other tests of the chemical composition of water at any station are available.

Measurement of Volume

In order to measure the mass of material secured in the collections, a Bausch and Lomb hand centrifuge was used. The sedimentation tubes were graduated to tenths of a cubic centimeter. This machine makes 23 revolutions to each turn of the crank. After a few trials it was decided to run at 54 turns per minute. While no amount of practice made uniform speed possible, the average was kept at about 1300 revolutions per minute. The time of running was four minutes. Experience indicated that this was a little longer time than necessary, but it was undertaken with the intention of compensating for any possible inaccuracy due to variation in rate. Since this indicated only the mass of material held by the net, it was necessary to make some supplementary test to determine as nearly as possible what volume went through. Only two or three such tests were made because of the pressure of other duties, but the indication from filter paper tests is that the net sometimes retains only one-tenth of the mass of material actually present in the water. This material is often composed principally of silt.

The Enumeration

After considerable experiment, the count of the organisms in the catches was begun in September, 1914. Since the time available was nearly always at night, almost all the counting was done by artificial light from an ordinary 60-watt, frosted, incandescent globe. Only rarely was it possible to make two counts in one day. Hence the enumeration was not finished until the night of June 18, 1915.

Apparatus

The microscope used throughout was a Spencer with 16 millimeter objective and 8x ocular. It was equipped with a quick screw substage and a Spencer mechanical stage. The Whipple ocular micrometer and the Rafter counting cell were used. Its largest square covered 1.1 square millimeters with the above lens equipment, so that the labor of calculating was slightly increased by the fractional area.

PROCEDURE

Standard Concentration

In preparation for counting, all catches were first brought to a volume of 100 cubic centimeters by addition of water or, in a few cases, by decanting some fluid. If the concentration was too great at this volume, dilution was made to 400 or 800 or 1,600 cubic centimeters. No other quantities were used because the increase in difficulty of computation would offset the difficulty in counting. This was due to the fact that the above quantities were used often enough to make the formation of computing tables useful for them.

Method of Filling Sedgwick-Rafter Cell

In the process of filling the cell after thorough mixing a little more than 1 cubic centimeter was taken quickly into a pipette. The cell was then filled as rapidly as possible until the cover slipped into place. This never occurred completely until there was a slight excess of fluid. The excess was immediately taken back into the pipette, leaving the cover glass flat. The possibility of some error is evident, but experiment indicated that this method gave more even distribution in the cell than any other and that errors were not appreciably more frequent than those attending other methods. The method was followed throughout the whole series and every detail was handled by the writer, so that there must have been practical uniformity. This would certainly reduce the significance of any error which may have been incident to the method.

Making and Recording the Count

After filling the cell satisfactorily, a rapid survey was always taken in order to estimate the relative amounts of plankton and non-plankton. The estimate was then recorded in percentage of silt. With these preliminaries completed, the work of counting was begun, fifty fields being always counted. This made a total of 60.5 cubic millimeters. Counting was begun on the proximal side of the slide at point 32 on the lateral scale of the mechanical stage. The field next to the wall of the cell was not counted, but the next five were taken consecutively. This process was repeated at point 16, then at point 80 on the proximodistal scale at the right end of the cell, followed by point 87. Points 16 and 32 distal, 87 and 80 left, were then taken in order. The detail count was completed by ten fields from point 15 to

27 in the median line of the cell. The whole count was completed by running over exactly half of the cell looking for strays and for a check on larger organisms which might be irregular in distribution. After a year's experience the writer is inclined to think that twenty-five or thirty fields would be sufficient for the detailed count in view of the half-slide check. At any rate he is satisfied that the possibility of error in counting will rest elsewhere than on the method of selecting areas for counting. It might be said too, that the year's experience indicates that the method of filling the cell gives as uniform distribution of plankton in the cell as can be hoped for in any case.

The method of recording the count was almost uniform. Mrs. Allen sat near the microscope and wrote down names or made check marks as the names were called. In two or three cases about half the catch was recorded by the writer while himself counting. On about ten occasions he recorded as much as ten fields in like manner. These were the only exceptions. Occasionally the writer called the name of one planktont when another was intended, the mistake being noticed because it did not sound right. It is altogether probable that some such mistakes were made which were not noticed. In addition to this, of course, we must recognize the presence of clerical errors not humanly avoidable in such a mass of material. It can only be said that all reasonable precaution has been taken to avoid them.

Computation and Tabulation

After recording, the counts were computed for a full cubic meter, and then tabulated by key sheets, such as suggested by Professor Kofoid in his Illinois report. From these sheets they were finally transferred to the statistical tables.

Identification of Forms

Identification of species, or even genera, was very difficult in many cases. This was due to several conditions. First, the preserved planktont was often very different in appearance from the living specimen. Second, many kinds had very marked tendency to coherence or agglutination in formaldehyde. Third, many of the smaller organisms were hidden wholly or in part by silt or by larger organisms. Fourth, many different organisms have the same appearance in very young stages; they also resemble mature stages of simpler forms. Fifth, distinctive characters were frequently invisible in the position found in the Rafter cell. Sixth, many forms were not sufficiently figured and described in the literature immediately available for use. Seventh, much of the accurate identification of plankton forms would require long time and careful work, even for specialists in the various groups. The writer was hampered by lack of time and experience in identification in all groups. Eighth, the synonymy is confusing. This, however, is rather an aggravation than a difficulty in the sense of the foregoing.

This list certainly seems imposing as stated. As against it, the following facts should be noted. First, that more than one year was spent in studying the living materials, with both 16 millimeter and 4 millimeter objectives, before there was any attempt to count. In this way, sufficient familiarity was obtained with many forms to enable identification even in much contracted, distorted and broken conditions. Second, that most of the names as finally applied meant something definite to the writer, even though there might be error in their specific application. While this fact is unfortunate for the specialist who may wish to know exactly what species are present, it surely leaves the possibility of drawing some valuable conclusions as to seasonal changes, plankton rhythms, and relative numbers. Third, there were enough prominent planktonts, easy to identify, to make a good foundation for a report on plankton characteristics of this region at such stations as were selected. Fourth, those planktonts hardest to identify were mostly of the kind which would be largely lost through the meshes of the net, or which were adventitious and so of minor importance in solution of the greater problems of plankton production and distribution. Fifth, the various totals are not much affected by specific errors of identification.

Estimation of Silt

In estimating the percentage of silt, the same possibility of error was noticed as that mentioned by Kofoid (1908), i.e., some of the material, being flocculent in character, would appear unduly prominent in the Rafter cell; whereas, the compression of the centrifuge would make it relatively small in the volumetric record. While it seems probable that differences in the stations and in seasonal conditions give this error some real importance, there appears to be no way of avoiding it. There may be some compensation in the fact that with larger quantities of sediment there is usually a larger proportion of heavy materials, thus making the compressible materials less conspicuous.

The Clogging of the Net

The clogging of the net is undoubtedly an important factor affecting the catch and it was also quite variable under 1913 conditions here. Hence some designation of its probable condition is very desirable. In spite of this it was finally decided to ignore it for 1913 at least. This is because too few filter paper, or other supplementary, catches have been made to give adequate ground for estimation.

VOLUMETRIC DATA

There is not a great deal to say on this topic as yet. The main points are distinctly shown by plate 1 and table 6. The two most interesting points, in the light of such investigations elsewhere, are that only Station I shows a very distinct vernal pulse and that the autumnal pulses are most prominent at all stations. This statement needs some qualification since there was a higher maximum shown at Station I in March than in the fall. This vernal pulse was, however, so very abruptly developed, and the autumnal so very gradually, that it seems natural to assign the greater importance to the latter. At neither of the other stations does the vernal pulse compare in magnitude with the autumnal. Indeed, at Station III, there is no well marked, vernal pulse.

It is worthy of note that volumes appear least variable at Station I and most so at Station II. It might, at first thought, seem that this was owing to the uniformity of food supply at Station I, caused by the constant inflow of sewage throughout the year. Closer examination of the records suggests, however, that variation in speed of currents in the river, together with the dilution due to flood waters is more potent. This estimate of the importance of the current as a factor is supported by collections made in the San Joaquin River near Fresno, California, in August, 1916. Although this was the season for maximum occurrence of plankton at Stockton, not enough was taken by the net at Fresno to be measurable volumetrically with any accuracy. Since the current at Fresno is about as rapid in the dry season as at Stockton in flood season, it seems certain that it has a profound influence. Still the importance of the uniform food supply at Station I must not be minimized.

The whole series of collections for 1913 is now (1916) in the permanent possession of the Department of Zoology of the University of California.

ORGANISMS FOUND IN SAN JOAQUIN PLANKTON

Definitions

Professor Kofoid's definitions are followed as closely as possible, although only a few terms will be used. This report designates only three types of planktons, i.e., the continuous, the periodic and the adventitious. No closer distinction is advisable in view of the writer's lack of definite knowledge of life histories of various species. There has been no difficulty about the application of the general term "plankton" to the typically mixed population of minute living things found in these collections, because there was no case observed in which the plant or animal seemed distinctly out of place. It might be rare, and perhaps evidently ill-fitting, but in no way could its presence be regarded as surprising. Hence it becomes perfectly natural to apply the term collectively to all the organisms found.

Component Forms

A total of 471 planktonts was listed during the year, though only 396 were recorded from the preserved material. The number of species present was doubtless much greater. Those not recorded were found only in the living material and in small numbers. Of those recorded, some forms which might be distinct species were placed together in one because they could not be distinguished during the count. This lack of distinction was sometimes due to the inadequate preservation or to the rarity or to the difficulty of identifying specific characters while counting. Others were placed together because the writer's acquaintance with them was not sufficient for definite recognition. Very many were simply referred to the genus without attempt at species segregation because identification was too difficult to be undertaken in the time available. The question of probability of proper identification will be taken up in the detailed discussion of each form.

THE PRINCIPAL TYPES OF FRESH WATER PLANKTON

Among the 396 forms recorded and counted in the preserved material, 201 were thought to be positively identified as to genus, of which number 107 were also satisfactory as to species. The generic designation of most of the remaining 195 forms was regarded as probably correct though some were merely referred to the nearest possible genus or species according to the information at hand. The following table gives the general distribution of these forms among the three stations.

	At three stations	At two stations	At one station
Algae	90	29	53
Protozoa	56	26	37
Rotifera	44	11	26
Crustacea	8	2	2
Miscellaneous	3	1	8
Total	201	69	126

As might be expected of those found at only two stations most are from stations I and II. Those found at only one station are of the rarer, less conspicuous kinds.

This table shows the main characteristics mentioned by Kofoid (1908) as distinguishing fresh water from marine plankton. It may be well to enumerate his main points as verified in the present study. The plankton consists of cryptogams and invertebrates, with some orders missing and the others very variable in numbers of representatives. Larval forms are very few and the number of invertebrate groups much less than that of the sea. The small size of organisms in fresh water is also a conspicuous feature. There are no large crustaceans, no coelenterates, no mature mollusks, few worms, no tunicates or radiolarians, to make diversity such as that of the sea. In spite of the smaller size of the organisms in fresh water their total mass is much greater than that in the sea. The highest amount recorded here is 18 cubic centimeters per cubic meter; the smallest 0.28 cubic centimeters per cubic meter; while a typical marine product is stated as 0.12 to 0.48 cubic centimeter per cubic meter. The San Joaquin production noted was taken from net hauls only, the maximum from Stockton Channel, the minimum from Smith Canal. Filter paper catches show ten times the recorded volume in some cases.

Major Groups of Plankton

ALGAE

No plants higher than the algae have been found in these collections. Very few bacteriaceae were found because of their small size. Very few schizophyceae were conspicuous in 1913, though the numbers of individuals were sometimes large and the total quantity sufficient in late summer to give characteristic color to the waters. Bacillariaceae were always present and usually in large numbers. Many of them are doubtless adventitious. Chlorophyceae were not prominent, though some were present throughout the year. The conjugatae were not represented by many species and the numbers were few.

ZOOPLANKTON

Almost all the zooplanktonts found were included in the three groups Protozoa, Rotifera and Entomostraca. Other types of animals are decidedly rare.

Amongst the Protozoa, Ciliata and Mastigophora predominate. The group Mastigophora is meant to include the same organisms as comprised under that head by Kofoid (1908), i.e., "all green and brown flagellates, sometimes classified with the Chlorophyceae and Phaeophyceae." Rhizopoda were usually present but in small numbers. Heliozoa were rare except for one or two smaller forms which kept up rather large totals for the group. Suctoria were rare. No Sporozoa were recognized. Ciliata were distinctly more noticeable in the dilute sewage of Stockton Channel than at either of the other stations.

The Rotifera were even more prominent inhabitants of Stockton Channel than the ciliate Protozoa, but their numerical superiority may have been due to larger size and consequent capture by the net. The numerical difference at the other stations was not very marked. There is no question that their considerable size and large numbers entitle them to the leading place among analytic organisms assigned by Kofoid (1908) to the Illinois Rotifera. The greater abundance in the sewage laden water is, however, rather against his suggestion that they may be found to be more characteristic of river than of lake plankton. Local conditions indicate sewage or at least organic content as being a deciding factor. Apparently, most of the species recorded here are to be regarded as normal constituents of the local plankton.

With the exception of three or four specimens of *Gammarus* found on two different dates, and of a few miscellaneous forms, the Entomostraca are far the largest of the local planktonts. While much less numerous on the whole than they were in the Illinois River, they undoubtedly play a large part in the life of our waters. Copepoda, through larval forms, are distinctly in the ascendant, with Cladocera somewhat scattering and Ostracoda barely represented. Most of the forms found appear to be true planktonts. In fact, *Cypris,* the sole member of the Ostracoda, is the only genus which is evidently adventitious.

Turbellaria, Oligochaeta, Hexapoda, Hydrachnida, Gastrotricha and Bryozoa barely find representation at any station. Their influence in the plankton is negligible.

TOTALS OF MAJOR GROUPS

The following table of averages (text table I) will serve to indicate in some measure the proportionate representation in the San Joaquin plankton of the most typical constituent groups. As already noted elsewhere, 1913, was a comparatively dry year so that the production in most cases was probably below normal. The figures given are the result of the count of individuals, except in the case of colonial forms such as *Bacillaria, Synura* and *Scenedesmus* where the colonies only were counted. The small numbers as compared with Kofoid's similar table (1908) for the Illinois plankton of 1898 is mainly due to the fact that all San Joaquin enumerations are from silk net collections, whereas many of his were from filter paper catches. Our table includes all recorded forms whether satisfactorily identified or not. It should be noted that in the total of synthetic organisms Schizophyceae are included because they do some of that work. All of the Mastigophora are also included because there was not sufficient acquaintance with them to distinguish synthetic and analytic forms and it was understood that most of them found here were synthetic. The averages are computed on the basis of 104 catches for Station I, 52 for Station II and 51 for Station III. The daily and hourly series are not included in the general discussion except as incidentally referred to. They require separate discussion.

TEXT TABLE 1.—TOTAL PLANKTONTS BY MAJOR GROUPS

	Number of forms	Station I Total	Station I Average	Number of forms	Station II Total	Station II Average
Total Phytoplanktonts	85	2,720,856,600	26,162,100	97	2,216,347,628	42,622,068
Bacteriaceae	2	1,696,364	16,310	1	1,035,072	19,905
Schizophyceae	15	166,755,148	1,603,414	18	67,219,364	1,292,680
Chlorophyceae	15	188,417,098	1,811,722	13	77,972,944	1,499,479
Bacillariaceae	47	2,351,342,460	22,609,062	59	2,052,872,514	39,478,317
Conjugatae	6	12,651,930	121,653	9	17,247,734	331,687
Total Zoöplanktonts	141	1,102,116,740	10,597,272	110	229,332,166	4,410,230
Mastigophora	25	385,691,226	3,708,569	20	136,713,846	2,629,112
Rhizopoda	13	17,402,198	167,328	9	7,842,488	150,817
Heliozoa	5	38,583,488	370,995	5	13,376,096	257,232
Ciliata	29	98,463,242	946,762	16	23,291,268	447,909
Suctoria	3	79,296	762	3	467,776	8,995
Total Protozoa	75	540,219,450	5,194,416	53	181,691,474	3,494,065
Rhizota	2	156,992	1,509	3	1,933,424	37,181
Bdelloida	6	36,328,460	349,312	6	2,449,472	47,105
Ploima	47	467,115,946	4,491,499	34	41,559,652	799,224
Total Rotifera	55	503,601,398	4,842,320	43	45,942,548	883,510
Cladocera	3	400,992	3,855	4	384,000	7,384
Copepoda	4	57,856,500	556,312	3	770,768	14,822
Total Entomostraca	7	58,257,492	560,167	7	1,154,768	22,206
Miscellaneous	4	38,400	369	7	543,376	10,449
Total planktonts enumerated	226	3,822,973,340	36,759,372	207	2,445,679,794	47,032,298
Synthetic		3,104,857,862	29,854,420	......	2,352,026,402	45,231,275
Analytic		718,115,478	6,904,952	......	93,653,392	1,801,023

TEXT TABLE 1.—TOTAL PLANKTONTS BY MAJOR GROUPS—*Continued*

	Number of forms	Station III Total	Station III Average	Number of forms	Daily Total	Daily Average
Total Phytoplanktonts	93	2,090,812,294	40,996,318	53	1,018,801,028	32,864,549
Bacteriaceae	1	116,992	2,294	1	115,392	3,722
Schizophyceae	16	99,840,742	1,957,661	12	80,574,044	2,599,163
Chlorophyceae	13	91,241,112	1,789,041	11	67,560,712	2,179,378
Bacillariaceae	55	1,878,169,822	36,826,859	25	869,719,232	28,055,459
Conjugatae	8	21,443,626	420,463	4	831,648	26,827
Total Zoöplanktonts	108	253,153,822	4,963,800	61	335,441,120	10,820,681
Mastigophora	25	134,216,822	2,631,702	14	57,456,320	1,853,429
Rhizopoda	11	14,706,624	288,365	4	3,155,872	101,802
Heliozoa	4	14,003,600	274,580	2	19,193,826	619,156
Ciliata	17	22,003,692	431,445	6	40,488,334	1,306,075
Suctoria	2	409,984	8,039	0	....	....
Total Protozoa	59	185,340,722	3,634,131	26	120,294,352	3,880,462
Rhizota	3	1,539,424	30,185	......	....	....
Bdelloida	3	2,897,100	56,806	3	3,745,752	120,831
Ploima	33	61,996,492	1,215,618	27	165,007,160	5,322,812
Total Rotifera	39	66,433,016	1,302,609	30	168,752,912	5,443,643
Cladocera	3	469,040	9,197	2	230,400	7,432
Copepoda	3	742,032	14,549	2	46,141,056	1,488,421
Malacostraca	1	20	....	......	....	....
Total Entomostraca	7	1,211,092	23,746	4	46,371,456	1,495,853
Miscellaneous	3	168,992	3,314	1	22,400	723
Total Planktonts enumerated	201	2,343,966,116	45,960,118	114	1,354,242,148	43,685,230
Synthetic	......	2,225,029,116	43,628,020	......	1,076,257,348	34,717,978
Analytic	......	118,937,000	2,332,098	......	277,984,800	8,967,252

Text Table 1.—Total Planktonts by Major Groups—*Concluded*

	Number of forms	Hourly Total	Hourly Average
Total Phytoplanktonts	61	476,644,270	32,172,832
Bacteriaceae	1	112,192	8,630
Schizophyceae	12	64,886,064	499,123
Chlorophyceae	10	22,150,470	1,703,883
Bacillariaceae	32	377,380,220	29,029,248
Conjugatae	6	12,115,324	931,948
Total Zoöplanktonts	72	179,588,061	13,814,465
Mastigophora	15	51,114,592	3,931,892
Rhizopoda	8	5,160,360	396,950
Heliozoa	4	5,739,216	441,478
Ciliata	6	40,775,578	3,136,583
Suctoria	1	25,600	1,969
Total Protozoa	34	102,815,346	7,908,872
Rhizota	3	209,888	16,145
Bdelloida	2	2,930,384	225,414
Ploima	29	70,717,563	5,439,813
Total Rotifera	34	73,857,835	5,681,372
Cladocera	2	451,776	34,752
Copepoda	2	2,463,104	189,469
Total Entomostraca	4	2,914,880	224,221
Miscellaneous			
Total Planktonts enumerated	133	656,232,331	45,987,297
Synthetic	......	527,758,862	36,104,724
Analytic	......	128,473,469	9,882,573

COMPARISON WITH ILLINOIS FORMS

As in the case of the Illinois River, this table shows plants to be more numerous than animals, though they are generally smaller. The disparity in numbers is slightly different being, in recorded order of stations 2.5, 9, and 9 to 1, instead of 5 to 1 as in the Illinois River. The preponderance of Rotifera and Protozoa over Entomostraca is less marked than in Illinois, being 8.5, 45, and 50 to 1; and 9, 180, and 151 to 1, respectively. The numbers of Rotifera and Protozoa are not markedly different from each other in Stockton Channel though Protozoa are four or five times as numerous as Rotifera at the other two stations. In Stockton Channel synthetic organisms are relatively few even among plants proper. In this place the principal food of the zooplankton, therefore, is probably furnished by the Bacteriaceae and other saprophytic plants. For this reason the forms of plankton usually rated as important in more or less direct support of a fish fauna are few in kinds if not in numbers, although there is a conspicuous animal population.

At Station I, Copepoda (including immature forms) outnumber Cladocera about 18 to 1, but only about 2 to 1 at Station II and 1.5 to 1 at Station III. Protozoa are 1210, 500, and 404 to 1 of the Cladocera, distributed as follows: Rhizopods 45, 22, and 32 to 1, Ciliata 236, 64, and 48 to 1, Mastigophora 927, 361, and 292 to 1. Cladocera are outnumbered by plants 6540, 6090, and 4555 to 1. Diatoms are responsible for most of this with 5652, 5640, and 2314 to 1. Schizophyceae appear at 400, 185, and 217 to 1 and Chlorophyceae 452, 214, and 198 to 1.

The most striking features of these results when compared with those of Kofoid (1908) are two in number. First, there is the remarkable number of Copepoda in Station I. Second, the astonishingly small number of synthetic organisms and of Protozoa at all stations, in proportion to the number of Cladocera. Since Cladocera are almost all caught in the adult stage and since they are almost all retained by the silk net, they present very good ground for comparison of plankton catches everywhere. Hence the numbers of Cladocera, the lack in numbers of other organisms and the results of the few, filter paper catches point conclusively to the fact that the numerical and volumetric study of plankton calls for absolute filtration, high magnification and a laborious technique adequately to represent the sources of food, and the interrelations of the organisms of the plankton.

DETAILED DISCUSSION OF STATISTICS RECORDED BY THE AUTHOR

Prefatory

Tables and plates have been prepared to show in numerical or graphic form the various facts of distribution and occurrence which are or may be reckoned as important. This commentary is intended to elucidate and amplify such records and to serve especially as a guide to the details of observation or conclusion concerning which the writer is certain or uncertain. Averages, when given for each organism in numbers per cubic meter will be given for each station on the basis of 104 collections at Station I, 52 at Station II and 51 at Station III. Averages are only used because there is no other way of making a general numerical comparison in brief form. Temperatures, in degree Centigrade, are given both for surface water and for air. While the latter may be unnecessary it was thought that it might help to give an idea of the conditions locally.

Numbers of planktonts are recorded in units for the same reasons of consistency and convenience as those mentioned by Kofoid (1908). There is not the slightest intention to imply fictitious accuracy by unit expression. Those who prefer can read the record in "round numbers." The writer himself rarely gives any thought to more than the first three figures of a number.

ALGAE

Bacteriaceae

Members of this group were unquestionably abundant both in numbers and kinds, but they were very rarely retained by the silk net. In fact, *Spirillum undula* was the only representative recorded from Stockton Channel, the station most favorable for Bacteria and giving most evidence of their presence. The average number there, 16,310, is ridiculously small in view of the general conditions and in consideration of the filter paper collections which indicated a total volume of catch about ten times as great as that found in the silk net catches. The relatively great numbers of Cladocera and Copepoda also serve to emphasize the fact that the large portion of the plankton population is very freqently beyond the reach of the usual methods of observation. Silk net methods can never be more than suggestive of the productivity of the waters since they must deal mainly with the giants of the plankton. For that reason, an extended discussion of the Bacteriaceae cannot be undertaken for this series. It might be said, however, that general conditions indicate a maximum production of Bacteria in late summer along with the other groups.

Beggiatoa and *Micrococcus* were only recorded from Stations II and III, and then only once, but they were probably common at all stations.

Schizophyceae

	Station I	Station II	Station III	Daily	Hourly
Number of forms	18	15	15	15	7
Average per cubic meter	1,603,414	1,292,680	1,957,661	2,599,163	499,123

This group was most conspicuous at all stations in July, August and September, when it gave a peculiar color and appearance to the water, but it had some representation throughout the year. *Anabaena*, *Nostoc* and *Oscillatoria* were generally most prominent. Some of the smaller forms were probably represented but not identified. Some small forms were also probably confused with other groups. The group, as a whole, does not seem according to record to be of quite so great importance as in the Illinois, but this apparent lack is doubtless due to escape through the net. The color of the water alone would suggest that much of the material is lost. It is then, not only safe to say that the group is valuable in furnishing food for other organisms, but also that it probably holds a high place in working up the organic content of the water. Identification, even of genera, was frequently rather difficult in this group, although there was not often any question as to their belonging to the Schizophyceae. Names as recorded are to be regarded as suggestive rather than positive. Eyferth's *Einfachste Lebensformen* and Tilden's *Minnesota Algae* were the guides mainly used.

Discussion of Species

Anabaena spp.

	Station I	Station II	Station III	Daily	Hourly
Average	57,600	317,644	437,967	245,139	1,531,949

Not clearly distinguished from *Nostoc,* straight filaments being the characteristic usually considered indicative. Includes some *Aphanizomenon.* Found occasionally throughout the year. Abundant only in July, August and September, at all stations, in a water temperature ranging from 23.5° C. to 28° C. Largest number recorded at Station I on July 12, Station II on August 9, and Station III on July 19.

Aphanocapsa spp.

	Station I	Station II	Station III	Daily	Hourly
Average	117,381	84,916	74,329	441,469	187,647

Most of the colonies counted under this name probably belong under *Clathrocystis* and *Microcystis.* There were probably few, if any *Aphanocapsa* present. The characteristics of *Aphanocapsa* were not understood until the count had gone too far for revision. Since *Clathrocystis* and *Microcystis* were also more or less subject to confusion it was thought best to let the record for 1913 stand under this head. The maximum production occurs at about the same time as that of *Microcystis* at all stations. Hence the error probably affects nothing but the question of species distribution. *Clathrocystis* does not appear on the record though now known to be present and it might be well to transfer the *Aphanocapsa* count to that heading. The late summer maximum, occurring in higher temperatures and the sudden fall in numbers in colder waters suggests the characteristics of *Clathrocystis* as noted by Kofoid (1908) in Illinois.

Coelosphaerium kützingianum Naeg. Recorded three times from Station III and once from each of the other stations. Very small numbers in all cases. Identification not positive.

Gloeocapsa conglomerata Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	13,685	4,438	11,015	191,027	49,811

Recorded only in July and August at all stations. Identification not positive. Abundant through daily and hourly series and in considerable numbers for the few times taken in the regular series. However, not an important factor so far as these catches indicate. Losses through net probably heavy.

Gloeocapsa spp.

	Station I	Station II	Station III	Daily	Hourly
Average	197,400	141,594	181,426	520,660	539,132

Probably several species are included under this heading. They are found at all stations throughout the year though most abundant in July and August. Losses through the net were probably very heavy and the genus must play an important part in local waters. Identification considered probable though some confusion affected the count at times.

Gomphosphaera aponina Kg.

	Station I	Station II	Station III	Daily	Hourly
Average	7,856	8,968	14,485	726	36,620

Identification uncertain. Occurrence at irregular intervals throughout the year at all stations. Numbers small.

Inactis tinctoria Agardh

	Station I	Station II	Station III	Daily	Hourly
Average	532,790	215,653	594,302	0	105,792

Identification uncertain. None recorded until August. Very few after October at any station. Numbers large while present. Heavy loss through net probable. Evidently of considerable importance in the plankton while present.

Merismopedium glaucus Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	89,512	5,117	6,992	413	210

Identification satisfactory. Losses through net very heavy. Numbers fairly large in November and December. Rarely recorded earlier in year. Small size makes it easy to overlook even when present.

Microcystis sp.

	Station I	Station II	Station III	Daily	Hourly
Average	44,240	64,890	43,646	166,545	364,169

Identification satisfactory. Count probably too low on account of confusion of some colonies with other forms. Found occasionally throughout the year at all stations. Much more abundant in July, August and September. Loss through net certainly very great. An important member of the plankton, but net catches do not afford a good basis for discussion of its distribution.

Nostoc spp.

	Station I	Station II	Station III	Daily	Hourly
Average	156,435	301,283	459,306	547,678	1,794,781

All the plants included under this head were filaments of the contorted type. The count gives the number of filaments in some cases though usually fragments of colonies constituted the units. Whole colonies were rarely, if ever, found. Possibly three or four species are included in this enumeration. *Nostoc* appeared occasionally throughout the year and became quite prominent in July, August and September. In view of the fragmentary condition of the colonies it is probable that the loss through the net was considerable.

Oscillatoria formosa Bory.

	Station I	Station II	Station III	Daily	Hourly
Average	2,037	45,699	2,205		

Identification uncertain. This form occurred more often at Station II where it was recorded frequently throughout the year, reaching its maximum in June. It does not seem to be very important since its size makes it improbable that loss through the net was very great.

Oscillatoria spp.

	Station I	Station II	Station III	Daily	Hourly
Average	210,437	32,323	49,941	299,126	105,792

Probably three or four species are included under this heading. Found occasionally throughout the year but distinctly a summer form. Maximum in August. *Oscillatoria* of all kinds were nearly always found in single filaments or fragments of filaments. Masses of filaments were rarely seen. This might be considered as supporting Kofoid's suggestion (1908) that physiological conditions may at times make *Oscillatoria* a temporary planktont. On the other hand it does not furnish very definite proof against the view that this form is an adventitious planktont, cast adrift by gas bubbles or violent currents.

Oscillatoria tenuis Agardh.

	Station I	Station II	Station III	Daily	Hourly
Average	46,340	2,404	3,040	154,363	12,207

Identification uncertain. Not a very prominent form. General occurrence much the same as for the above mentioned species.

Phormidium spp.

	Station I	Station II	Station III	Daily	Hourly
Average	121,571	31,248	86,171	25,595	....

Probably includes more than one species. Genus uncertain also. Occurrence occasional through the year. Most abundant at Station I. Maximum in September. Not a very prominent planktont.

Stigonema sp.

	Station I	Station II	Station III	Daily	Hourly
Average	1,317	45,665	8,831	....	....

Identification very doubtful. Filaments always fragmentary. Nothing but vegetative cells seen. Referred to Stigonema partly on account of occasional lateral arrangement of two cells in the filament. Never very prominent. Maximum in June at Station II where it was most often found. Apparently of little importance. Probably adventitious.

The following forms were recorded but once, at one or more stations, or else are listed because thought to be present in living material:

Calothrix sp. Recorded once at Station I.
Clathrocystis aeruginosa Kg.
Cylindrospermum comalum Wood.
Dactylococcopsis rhaphidioides Hausg. Recorded once at Station I.
Gloeocapsa gelatinosa Kütz.
Lyngbya sp. Recorded once at Stations I and II.
Oncobyrsa rivularis Kutz. Recorded once at each station.
Rivularia sp. Recorded once at Station I.
Symplocastrum sp. Recorded once at Station III.

Chlorophyceae

	Station I	Station II	Station III	Daily	Hourly
Number of forms	15	14	17	8	8
Av. numbers per cu. meter	1,811,722	1,499,479	1,789,041	2,179,378	1,703,883

These averages indicate only about one-thirtieth of the number found by Kofoid (1908) in Illinois. Since, however, the main contribution here was made by *Actinastrum, Coelastrum, Pediastrum* and *Scenedesmus* it may be readily understood that losses through the net account for most of the difference. The group was represented through the entire year, though the numbers were often very few. Station I showed the peculiarity of a great increase in numbers in May and June, a decline in July and August, and another well sustained increase in September, October and November. Stations II and III showed only one conspicuous rise in numbers, covering about four months, from July to October inclusive. The numbers occurring in other months were very small. It is quite difficult to determine the cause of the two pulses at Station I as distinguished from the other two stations. It could hardly be temperature since that factor remains too nearly constant during the period involved. The earlier increase in May might be ascribed to the more quiet water rich in organic matter, and the continuance through November might be aided by the sewage. The most probable explanations of the intermediate fall in numbers seems to be that predatory organisms may have been most prominent at that period or that stagnation of the sewage laden water hindered growth and multiplication. The possibility of the last named factor being the more important is supported by the fact that increase comes in September when there begins to be some relief from stagnation by increase of supply from the mountain streams. This relief was not very great in 1913, however, nor is it very well marked in any year. The possibility of interference by other organisms is supported by the fact that the numbers present are mainly influenced by the numbers of *Scenedesmus*, an organism very likely to be extensively used for food by some of the organisms of the zooplankton. Amongst the *Ciliata*, *Vorticella* seems most likely to be responsible while *Asplanchna* is the most prominent of the Rotifera. But the *Copepoda* are still more characteristic of this period and the summer decline of *Scenedesmus* may be due mainly to their activity. *Chlorophyceae* were never very conspicuous in 1913 and they were outnumbered by diatoms 14 to 1 and by *Mastigophora* about 2 to 1. Uncertainty as to the percentages of losses of various forms through the net makes definite conclusion impossible.

The very interesting question concerning recurrent pulses and their relation to lunar cycles, discussed by Kofoid (1908), cannot be answered any more definitely here. It is clear from these net catches that there are recurrent pulses (plates 1–5) at about three to six weeks intervals but there is nothing which warrants more than an indorsement of his provisional conclusion that there may be an increase in number of chlorophyll bearing organisms to correspond with each recurrent increase of light from the moon. It is altogether probable that this problem cannot be solved until some one is able to carry a long series of daily catches, carefully timed, and by more accurate methods than those of the silk net. Whether any filter method would suffice is hard to say. It was hoped that the daily series carried for thirty-one days in 1913 would help to solve this problem but it presented no conclusive evidence. (Pl. 6.)

Thirty forms were recorded in the count and it was thought that several others were recognized in the living material. Certainly there were more species present. So far as net catches indicate, *Pediastrum* was the leader both numerically and volumetrically, at Stations II and III. At Station I it was not far different from *Scenedesmus* in numbers (coenobia counted) and of course, exceeded it in volume of catch. *Scenedesmus* was clearly second in importance, *Actinastrum* third and *Coelastrum* fourth. *Crucigenia, Raphidium, Richteriella* and *Schroederia* were frequently found. In view of the common occurrence of *Botryococcus* in other places its scarcity here needs explanation. Failure to identify seems to be the most probable reason, though it may actually have been absent usually.

Present methods do not show the dilute sewage water of Stockton Channel to be much more productive of *Chlorophyceae* than the river. Hence such evidence as we get from this study only weakly supports Kofoid's suggestion (1908) that sewage laden waters favor the increase in numbers of the group. At any rate there is clear indication that the *Chlorophyceae* contribute largely to the plankton at all stations.

Discussion of Species

Actinastrum hantzschii Lagerh.

	Station I	Station II	Station III	Daily	Hourly
Average	51,050	216,851	257,954	36,939	392,439

Identification satisfactory. The combined averages of two varieties of this species are given here. They are recorded separately in tables 1 to 5. The only difference noted was in size, the one recorded as "large" being from two to four times as large as the typical form measured by length of the cell. As might be expected, it is largely responsible for the enormous average here as compared with the silk net average (338) in Illinois. Without it, however, the average is much greater, thus indicating a distinctly greater prevalence of the species here. It will be noticed too that Stockton Channel with its dilute sewage shows only about one-fourth of the average numbers produced by the other stations. The typical form was found occasionally at all stations throughout the year and it also reached its greatest abundance at the same three periods at all stations, i.e., March, June and September, the last showing the maximum. The large variety came in late (April and May), produced a weak pulse in July, and strong pulses in August and October; it dropped out again in November. Apparently temperature affected it much more definitely than it did the typical form. Temperature is not the deciding factor, however, as is shown by the fact that this variety appeared last in the warmer water of Stockton Channel whence it also practically disappeared first. Its lower temperature limit seems to be about 14° C. Stockton Channel was distinctly less favorable to the large form than to the typical form as is shown by the difference in numbers being greater there than at the other two stations (tables 1 to 3). Gradations in size between the two forms sometimes made separation difficult. This species is evidently of considerable importance here.

Coelastrum microporum Naeg.

	Station I	Station II	Station III	Daily	Hourly
Average	190,313	31,595	60,819	143,454	107,761

Identification satisfactory. Possibly includes at least two other species. Coenobia counted. Was not found at Stations II and III until July, and only five times before that at Station I. Maximum in September at all stations. Last appearance on December 14 at Station I, a month later than at the other places. Obviously favored by the slightly higher temperature of Stockton Channel. The difference in averages also suggests a distinct preference for sewage water. The maximum in September, when there was little disturbance of the waters, may indicate great susceptibility to action of strong currents and to rising and falling flood waters with their rapid changes in temperature. The September pulse is the only distinct one. In view of the enormous losses through the net, *Coelastrum* must be reckoned as an important planktont, though it is mainly limited to temperatures above 15° C.

Crucigenia lauterbornii Schmidle.

	Station I	Station II	Station III	Daily	Hourly
Average	....	....	....	....	....

Identification fairly satisfactory. Recorded once from Station II, four times from Station III. Average of colonies for the year at Station III, 14,771. Clearly too small for accurate study by net methods. Occurrence in September and October.

Pediastrum boryanum Menegh.

	Station I	Station II	Station III	Daily	Hourly
Average	9,913	41,265	72,153	12,612	37,474

Identification inexact. Coenobia with bicornate marginal cells but without intercellular spaces were counted under this head. Various gradations and differences in detail make it seem probable, as Kofoid (1908) found in Illinois, that at least two or three species may at times be represented in the count.

Present throughout the year at all stations. Missing irregularly in almost every month at Station I, less often at the other two. Very few in January and December. Distinctly more numerous at all stations than in Illinois. Sewage water evidently less favorable for its development. All stations show a March pulse of some moment and another in September. There is some evidence of recurrent pulses corresponding to lunar cycles, strongest at Station II. Maxima in September at Stations I and II, October at Station III. The most consistent record at Station I is in March and November, indicating a preference in sewage water for temperatures from 13° C. to 19° C. Since the only misses at Station II are in May, June and December the same inference might be drawn as to temperature if it were not for the fact that the representation was well sustained through August to November. Somewhat similar conditions were shown by Station III. At all stations the fluctuations were well marked at all seasons. This was even more true of the daily series at Station I (table 4) than of the regular series. The fluctuations of the first half year may be mainly due to rise and fall of flood waters. It is more difficult to account for those of the succeeding four months under relatively stable conditions.

Pediastrum duplex Meyen.

	Station I	Station II	Station III	Daily	Hourly
Average	301,913	686,539	837,875	703,005	1,613,919

Diagnosis inexact. All the coenobia with more or less bicornate marginal cells showing distinct intercellular spaces were counted under this head. The assemblage as a whole is fairly constant to a provisional type and is quite possibly a single species. It was also different from the preceding form in its larger numbers, greater constancy of occurrence and greater regularity of development. Then too, this species has a more uniform chronology at all stations. There is a vernal pulse with maximum in March and an autumnal pulse with maximum in October. The marked decline after March is evidently chargeable in some way to flood conditions. The steady rise from July through August and September to the October maximum is just as evidently due to warmer temperature and greater stability. Though *P. duplex* is present at all stations through the whole year its optimum temperature is clearly near 20° C. The comparatively small numbers in Stockton Channel indicate that much sewage is detrimental. By similar reasoning it might be concluded that Smith Canal (Station III) supported a larger number than the river (Station II) because more organic matter is beneficial up to a certain point. Such a conclusion is not entirely warranted, however, because the river has an open channel with some flow while the other is closed at one end. This difference alone might amount to more than the organic content.

The indication of recurrent cycles due to lunar influence is more distinct with this form than the preceding though they are not at all regular even here (tables 1 to 3). The daily series shows an interesting suggestion of recurrent pulses at intervals of four to six days (table 4). In the hourly series (table 5), it appears that both *P. boryanum* and *P. duplex* reach maxima in the afternoon, suggesting diurnal influence of light and temperature. The data, however, do not warrant a conclusion. The hourly series needs extension.

There is no very definite relation of *Pediastrum* pulses to the volumetric pulses.

Pediastrum simplex Meyen.

	Station I	Station II	Station III	Daily	Hourly
Average	7,422	32,333	36,044	16,796	49,189

Identification fairly satisfactory. Coenobia having marginal cells with one median spine were counted under this head. Probably only one species included. Fewer than either of the foregoing forms at all stations, except that it exceeds *P. boryanum* in both the daily and hourly series. Rare at Station I through the first six months, considerable numbers there in July, very few in August, maximum in September, rare thereafter. Occurrence at the other two stations similar, except that the numbers were larger. So far as the records go they indicate the same general characteristics of distribution as mentioned for the foregoing species.

It is evident that *Pediastrum* is a very important genus, both numerically and volumetrically in the local plankton. The greater numbers here, as compared with Illinois, indicate that local conditions are better suited to this genus, but it is also true that this may have been an exceptionally favorable year. It is worth noting in this connection that the representation of *Pediastrum* is proportionally greater here as compared with other forms found in both sections and this fact favors the view that it is really more characteristic of our plankton.

Since the genus shows very distinct response to flood conditions, perhaps it is worth while to emphasize that point, especially in view of the fact that there are no reliable water gauge or tide records available. The rapid decline of numbers in March follows very closely on the arrival of the heavy stream flow from the mountains. The rapid rise in numbers in June is just as closely connected with the disappearance of flood waters.

Raphidium polymorphum Fres.

	Station I	Station II	Station III	Daily	Hourly
Average	131,037	48,363	47,002	129,935	29,744

Diagnosis inexact. Probably includes two or more species. Occurrence rare in winter months at all stations. Thrives best in Stockton Channel (Station I). While the numbers are large at times the records are so fragmentary, particularly in view of the enormous numbers escaping through the net, that no generalization can be made. There is, however, some support for Kofoid's observation (1908) that the organism has an optimum temperature above 15° C. Furthermore the larger numbers in Stockton Channel indicate the benefits of sewage.

Richteriella botryoides Lemm.

	Station I	Station II	Station III	Daily	Hourly
Average	5,723	20,806	27,499	....	....

Identification satisfactory. Occurrence at very irregular intervals at all seasons of the year and at all stations. Rather large numbers at times. Records too scant to warrant conclusions. Percentage captured evidently very small.

Scenedesmus obliquus Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	319,244	43,593	63,234	305,638	166,826

Diagnosis sometimes confused on account of apparent intergradations. May perhaps include two or three species. Rare in January and February. Few in March, April, May and December at all stations. Maximum in June at Station I, although the numbers are best sustained there through September and October. Other stations also show greater constancy in that period. Vernal pulse very slight so far as silk net can show. Average silk net catch in Illinois was given by Kofoid (1908) as 673. The largest Stockton Channel catch is about 500 times as great. If the silk net only captures a fraction of 1 per cent of the *Scenedesmus* present the numbers there were certainly enormous. In spite of the losses through the net it is at least safe to say that sewage and moderate temperature, 15° C. to 20° C. are especially favorable to this form. There are recurrent pulses apparently but the uncertainty as to the percentage of the population on record makes all such points unreliable.

Scenedesmus quadricauda Breb.

	Station I	Station II	Station III	Daily	Hourly
Average	772,520	224,775	363,308	786,615	366,203

Diagnosis sometimes confused by intergradations. Only a small percentage in doubt. Losses through net certainly very heavy, probably over 99 per cent according to Kofoid's results (1908). Hence inferences are to be made with caution as in case of the preceding species However, the greater continuity of the record for this species makes intelligent discussion possible.

A vernal pulse in March and an autumnal pulse culminating in October were quite well marked at Stations II and III. The vernal pulse is not clear at Station I and the autumnal maximum was reached in November. In no case was there very heavy representation until about June. At Station I a distinct decline through July and August suggests marked limitation by higher temperatures. Sewage water with temperature between 15° C. and 20° C. is evidently nearly ideal for *Scenedesmus.*

There is rather distinct indication of monthly pulses at all three stations (tables 1–3). These do not, however, correspond very closely with *Pediastrum* pulses, so it is hardly worth while to attempt to establish any connection with lunar cycles from present data.

This species was rarely absent from any station, never from Station I. Its appearance there in large numbers through the winter months clearly marks it as perennial in this locality. While the records of this and the preceding species are fragmentary so far as the whole population of the genus is concerned they show very clearly that the genus is of first rate importance in our waters through a large part of the year and especially where there is much organic matter.

Schroederia setigera Lemm.

	Station I	Station II	Station III	Daily	Hourly
Average	35,724	4,099	5,343	43,587	16,276

Identification satisfactory. Probably only small percentage captured by the net. Only recorded six times at Station III and three times at Station II. Irregular occurrence from last of April to end of year at Station I. Well represented through June and part of November. Not enough data to indicate more than a preference for dilute sewage.

Selenastrum bibrainum Reinsch.

Identification satisfactory. Recorded five times from Station I in small numbers. Once at Station III. Evidently too small to be held by the net.

The following forms were recorded only once or twice in small numbers or else were noticed in living material.

Botryococcus sp. Once at Stations II and III. May have been overlooked.
Bulbochaete sp.
Chodatella ciliata. Lemm. Once at Station III.
Crucigenia quadrata Morr. Once in daily series.
Crucigenia rectangularis Chod.
Crucigenia sp. Once at Stations II and III.
Dimorphococcus lunatus A. Br.
Draparnaldia plumosa Ag.
Golenkinia radiata Chod. Once at Stations I and III.
Lagerheimia wratislaviense Schroed. Once at Station I.
Lauterborniella elegantissima Schmidle. Once at Stations I and II.
Monostroma sp. Once at Station III.
Nephrocytium agardhianum Naeg.
Pleurococcus sp.
Sorastrum spinulosum Naeg.
Stigeoclonium (?) sp. Twice at Stations I and II.
Tetrastrum sp. Once at Station III.
Ulothrix sp. Twice at Station I. Doubtful identification.

Bacillariaceae

Plates 7–9

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	44	58	53	25	32
Av. number per cu. meter	22,609,062	39,478,317	36,826,859	28,055,459	29,029,248

The diatoms are distinctly the most abundant group of organisms in San Joaquin plankton so far as present methods show. According to these records they outnumber Schizophyceae 14, 33 and 18 to 1; Chlorophyceae 12, 28 and 21 to 1, and Mastigophora 6, 14 and 7 to 1 at Stations I, II and III respectively, thus making them appear to have a still more prominent place in the plankton than they had in Illinois. There were always some diatoms in every collection at all stations throughout the year.

There was only one very distinct pulse at each station. At Station I this appeared in May, while at the other stations, where it was larger but less abrupt, it came in August. There is no way of telling from these records whether this difference was due to better temperature or to more stable conditions at those times. The fact that Smith Canal resembles the river in temperature and is more like Stockton Channel in stability suggests a stronger influence of temperature. A glance at plates 7, 8 and 9 shows a marked resemblance of all three stations in low production of diatoms through the first twenty and the last six weeks of the year. All show comparatively heavy production through all the intervening period though the culmination is more nearly median in this time at Stations II and III. This characteristic of distribution is common to all the algae. These major pulses are evidently composite though the exact location of their maxima may be due to single species. The diatoms as a group show more marked indication of pulses recurrent at approximately four weeks intervals than do any other algae.

One notable difference in the three stations is that the total production is less at Station I than at either of the others. Except for the difference in the location of the maxima this was shown throughout the year. The production in winter and spring is continuously less at Station I. Although the maximum came earlier it did not appear so abruptly nor decline so quickly as at both Station II and Station III. Sewage seems to be detrimental, as does a temperature above 23° C. However, it is not certain that temperature is the determining factor, for stagnation of the water probably has a deleterious effect more quickly in sewage water than in water comparatively clean. It seems quite possible that simultaneous strong flood currents through Stockton Channel and the river would hold the maximum back to a similar date. Some light on this question may be expected from the 1914 series which covers a time of heavy flood. Again there is the possibility that predatory organisms, notably Entomostraca, cut down the supply of diatoms in spite of favorable conditions for development. The maximum for Entomostraca comes at the time of decline of production of diatoms in the summer (plates 3, 9).

The fact noted by Kofoid (1908) that the volumetric measure shows mainly the zoöplankton is especially important here because there is not sufficient check by other methods to give any idea of the relative loss of phytoplankton through the net. The diatom count corresponds pretty closely, in its rise and decline, to the volumetric record (plates 1, 7, 8, 9) at Station II and III but no very definite relation appears at Station I. This might be expected from the fact that a moment's examination gives one the impression that the Stockton Channel plankton is distinctly animal and the river plankton mainly plant.

While the records of Station I might lead one to think there possibly were reproductive cycles and successive rest periods as suggested by Kofoid (1908) the records for Stations II and III point rather the other way. The strong and somewhat rapid rise through June and July to a maximum in August with a similar decline to the winter level suggests, indeed, that factors of the immediate external environment are responsible and that increase in numbers would continue indefinitely if the proper balance of temperature, food materials and natural enemies could be secured along with sufficient removal of injurious accumulations.

The number of forms of diatoms listed (98) may seem unwarranted inasmuch as there could be no hope of accurate determination of all the species present. The large list was the cumulative result of an effort to give expression to differences noted. The futility of it was not realized until too late to change it easily. After all, it happens that there are only a few forms found frequently and in great numbers and most of these can be approximately determined.

Twenty forms occur at one or more stations with sufficient continuity to give the impression that they are true planktonts. These are *Asterionella gracillima, Bacillaria paradoxa, Cyclotella* spp. *Cymatopleura solea, Cymbella affinis, Cymbella cymbiformis, Cymbella tumida, Fragillaria capucina, Gyrosigma kützingii, Gyrosigma scalproides, Melosira granulata, Melosira varians, Navicula alpestris, Navicula bacillum, Navicula gracilis, Nitzschia acicularis, Pleurostauron parvulum, Surirella* spp., *Synedra radians, and Synedra ulna.* Distinctly the most important of these are *Asterionella, Bacillaria, Cyclotella, Melosira* and *Synedra,* all of which are satisfactorily determined as to genus, though the species are sometimes uncertain. Most of the other genera just mentioned are also believed to be correctly designated. Much of the specific determination is largely guess work for the inexperienced observer under the conditions of counting. Fortunately such errors do not materially affect the generalizations within reach of this present study. Schönfeldt's "Bacillariales" in the *Süsswasserflora Deutschlands* series was the main dependence for identification.

Discussion of Species

Asterionella gracillima Heib.

	Station I	Station II	Station III	Daily	Hourly
Average	344,378	1,743,406	1,381,583	3,516	12,206

Identification certain. Records show numbers of colonies. Average size of colonies at Station I was three, at Station II four, at Station III three. Two forms were noted, a typical and a large form. They were recorded separately in tables 1 to 5 though the above averages are for the two combined. As in the case of *Actinastrum* the two were alike except for size but the larger was usually only about 50 per cent larger, rarely twice as large. There were sometimes all gradations in size but in most cases the distinction was plain. It will be noticed by reference to the tables that the pulses ran somewhat the same with both forms at all stations but that the large form appeared rather late at all stations and that it was only prominent in May and June at Stations I and II, June at Station III. Perhaps this condition warrants the inference that the large form is favored by a temperature above 20° C. especially since the June maximum comes at the highest temperature (26°.5 C. and 29° C. respectively at Stations II and III) and very nearly so at Station I (22° C.).

Both forms were practically absent at all stations through July, August, September and October. Both reappear in November. The typical form is abundant at all stations except during the four months just mentioned. At Station I it showed a strong pulse in January and a maximum pulse in March. Another strong pulse came in December. At both of the other stations the maximum pulse came in February and a very strong pulse in December. If both forms be counted together, Station II is seen to have almost as large a pulse in June as in February. The combination also shows a very large pulse in June at Station III. The abrupt disappearance of both forms in July at all stations must be due to some other factor than temperature since the temperature change is neither abrupt nor very marked. Stagnation may have a strong deterrent influence. There are fairly well marked, recurrent pulses at four to six weeks intervals at all stations.

Very few single cells of *Asterionella* were recorded. This can be accounted for in two ways: first, escape through the net; second, confusion with other single cells.

Amphiprora alata Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	12,847	4,161	21,057	8,373	268,548

Identification satisfactory as to genus and probable as to species. *A. ornata* is probably included in the count at times, as it was sometimes found by the writer and was also identified in 1915 catches by Professor C. J. Elmore. Probably heavy loss through the net. So far as net catches show it is not so very important. Occurrence rather scattering at all stations though fairly constant in latter part of the year at Station I. Maximum at Station I in May, at other stations in June.

Bacillaria paradoxa Gmel.

	Station I	Station II	Station III	Daily	Hourly
Average	8,547	1,647,817	984,810	28,857	254,916

Identification positive. Colonies usually large, hence probably very little loss through the net. Occurrence scattering at Station I, fairly constant through the year at Station II and III where it was abundant through the second half year. Maximum in July at Station I, August 2 at Station II, and August 9 at Station III. Conspicuous minor pulses in April and December at Station II; April, September and December at Station III. The sudden jump into prominence at Stations II and III in July and the reappearance at Station I, where it had been absent more than two months, seems to indicate favorable influence of stagnant water. Retardation by sewage is also indicated. Higher temperatures may have a bearing, though the temperature change is not nearly so abrupt as the change in numbers of *Bacillaria*. There are no very strong indications of recurrent pulses at any station, but Station II shows them slightly.

B. paradoxa is certainly one of the most important planktonts of the river after the flood season. Colonies containing less than ten individual cells were comparatively rare, certainly not more common than those consisting of more than twenty-five. It would be very safe to estimate the average number of cells captured at ten times the average recorded for the colonies. This would bring *B. paradoxa* into the foremost rank of planktonts, numerically, at Stations II and III. Only *Cyclotella* sp. and *Melosira granulata* would clearly exceed it in numbers by that reckoning. The other forms which might do so are not identified with sufficient certainty.

Cocconeis pediculus Ehrbg.

Determination probable. May include other species. Losses through net undoubtedly heavy. According to the records not a very important planktont. Occurs five times at Station I, thirteen times at Station II with a maximum of 105,792 at the end of May, and four times at Station III.

Cyclotella spp.

	Station I	Station II	Station III	Daily	Hourly
Average	15,052,042	6,335,253	6,865,673	13,191,571	5,415,717

Genus identification certain. Probably includes three or more species, certainly two. Impossible to distinguish species completely while counting though the attempt was made throughout the whole series for 1913. It was finally decided that more accurate conclusions were probable if all counts were thrown together. So few individuals are retained by the net that any conclusion must be taken with caution even then. Present through the year in all collections at all stations. Wide range in size. Most of them nearer the smaller limit as noted by Kofoid (1908).

Maximum numbers at Station I in June, at both of the other stations in October. One minor pulse is of unusual interest because it falls on January 19 at all three stations (tables 1–3). There is no great change in temperature to account for it but it came after a week of cloudy weather with more or less rain on the five days immediately preceding. It would seem that the condition of falling flood is responsible in this case. Possibly the June maximum at Station I can be explained in the same way. No such local conditions apply in case of the October maximum at Stations II and III. There was, however, about that time higher water than there had been for several weeks previous, due to the inflow from mountain tributaries enlarged by the early mountain rains.

So far as our present records show, the optimum temperature seems to be nearer 20° C. than 15° C. as found by Kofoid (1908) in Illinois. Sewage contamination, stagnation and flood waters all appear to be factors of marked importance in determining maximal production of this diatom. There is no indication of a maximum corresponding to the volumetric maximum (plate 1) such as was observed in Illinois, but this may be due to the small numbers caught as compared with those escaping.

Cymatopleura solea Breb.

	Station I	Station II	Station III	Daily	Hourly
Average	219	11,043	3,796	....	....

Identification satisfactory. Recorded only six times at Station I, but found at intervals through whole year at other stations. Numbers rather small. Loss through net considerable. Maximum in May at Station II with a well defined pulse. Maximum in August at Station III where there were no definite pulses. May be adventitious. Temperatures at maxima were above 20° C.

Cymbella affinis Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	1,283	73,671	10,276	516	20,345

Identification uncertain. This was a very small *Cymbella* relatively few of which could have been retained by the net. Recorded only eleven times at Station I. Abundant in March, April, May and June at Station II but missing in January, February and December. Scattering in other months. Maximum on May 31 in a well developed pulse. More irregular in occurrence at Station III where the maximum came in April. Probably an important planktont numerically. Evidently not favored by sewage.

Cymbella cymbiformis Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	446	8,382	4,331	310	4,561

Identification uncertain. Probably includes more than one species not distinguishable while counting. Recorded thirteen times at wide intervals at Station I, in small numbers. Small numbers recorded in every month of the year at Stations I and III with a fairly constant record through May and June at Station II. Apparently of minor importance.

Cymbella tumida Breb.

	Station I	Station II	Station III	Daily	Hourly
Average	2,245	23,677	3,547	619	5,546

Identification uncertain. Probably includes more than one species. Records scattering and in small numbers at Station I. Small numbers but fairly constant, May to September, at Station III. Recorded in every month except January and September at Station II. Maximum in May. Probably of minor importance.

Epithemia ocellata Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	1,015	15,713	3,579	413	8,630

Identification fairly satisfactory. Probably two other species included. Loss through net heavy. Numbers small and records scattering at Stations I and III. Representation fairly constant at Station II except in January, February and December. Maximum in May on a well marked pulse. May be adventitious since the maximum comes on the waters of the mountain flood.

Fragillaria capucina Desm.

	Station I	Station II	Station III	Daily	Hourly
Average	1,154	26,252	25,563	....	9,123

Identification satisfactory. Colonies usually rather large, seldom less than six cells. Most of the colonies probably retained, though loss of small colonies and single cells may have been heavy. Numbers very small at Station I and records few after April. Numbers larger and occurrence more constant at Stations II and III, though frequently missing there after August. Maximum in May at both places. No other pulse of particular note. Apparently not very important.

Fragillaria crotonensis Kitton.

	Station I	Station II	Station III	Daily	Hourly
Average	92	4,516	7,888	....	....

Identification satisfactory. Colonies not very large. Occurrence twice at Station I, seven times at Station II at wide intervals and nine times at Station III. The records at Station III are mainly in September, October and November. Evidently unimportant here in spite of considerable escape from net in catches.

Fragillaria spp.

	Station I	Station II	Station III	Daily	Hourly
Average	92	27,832	290	103	....

Probably most of those included under this heading belonged to *F. virescens.* Occurrence only twice at Station I. Represented at Station II by some fairly large numbers widely scattered. Colonies small. Apparently adventitious.

Gomphonema constrictum Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	1,322	22,094	282	103	8,138

Identification uncertain. Numbers small. Losses through net heavy. Recorded seven times at Station I at irregular intervals. Well represented in May and June at Station II. Recorded seven times at Station III in very small numbers.

Gomphonema spp.

	Station I	Station II	Station III	Daily	Hourly
Average	65	6,419	5,000	103	....

Under this heading are included some members of this group which could not be placed satisfactorily. Probably most of them were *G. subclavatum.* Apparently there were five or six species of this genus observed at various times and it probably has some importance though it may be adventitious.

Gyrosigma acuminatum Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	1,232	24,920	22,157	....	12,207

Identification uncertain. Recorded seven times at Station I at wide intervals, twelve times at Station II and Station III. Grouped in August at Station III. Considering amount of loss through net may have some importance though evidently adventitious.

Gyrosigma kützingii Grun.

	Station I	Station II	Station III	Daily	Hourly
Average	3,330	102,723	70,433	1,032	87,974

Identification probable. Losses through net very heavy. Recorded frequently in small numbers in every month except February, June, and July at Station I. Maximum there in September. Occurred regularly with only one or two breaks at Stations II and III. Maximum at Station II in late August in a well developed pulse. Maximum at Station III in late July at the beginning of a similar pulse which almost reached the maximum again at the same time with Station II. Minor pulses at from two to six weeks intervals through most of the year were rather prominent at both stations. Apparently this is a planktont of some importance throughout the year since the percentage retained by the net is undoubtedly small.

Gryrosigma scalproides Rabenh.

	Station I	Station II	Station III	Daily	Hourly
Average	13,733	31,294	206,444	826	480,133

Identification satisfactory. May include *G. spenceri* W. Sm. Loss through net heavy. Records scattering at Station I especially in first seven months. Maximum in August with a well developed pulse. Recorded in every month up to September and not later, at Station II, with a sharp pulse in August. Recorded every month after January and February at Station III though scattering until late July. Very strong pulse in August reaching apex on August 23. Seems to be, like other *Gyrosigma,* a seasonal planktont favored by temperatures above 20° C. and injured by sewage.

Melosira granulata Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	2,305,175	25,163,409	22,821,226	1,880,779	18,144,471

Identification certain. Mostly variety *spinosa.* Loss through net high. Kofoid (1908) says about 98 per cent in Illinois and it is doubtless nearly the same here. His observation that silk catches showed the same seasonal routine as the filter catches makes it seem probable that we can use our counts here with some confidence in the conclusions they may indicate. *M. granulata* is recorded in every collection through the whole year at all stations. At all stations the numbers are comparatively small until April, though the million mark was reached a few times before that date at each. The earliest count of this size was at Station I in January. The maximum at all stations falls on September 6, after a considerable period of rather high temperatures. A temperature of 25° C. or higher and stagnation of the water are at least two favorable factors in production. Since Station I has less than 10 per cent of the number at the other stations at that time it seems equally clear that sewage is detrimental. So far as the 1913 collections show, there is a rather definite growth period in September, though there are several prominent pulses through the warm season just as there were in Illinois. Minor pulses at from two to six weeks intervals were quite prominent characteristics of the occurrence of this organism everywhere. The steady decline from the September maximum in spite of occasional minor pulses strongly supports Kofoid's view that temperature is the most potent factor influencing production.

The time of maximum production corresponds fairly well with the time of greatest production of total plankton mass (plate 1), though the largest number is reached a little later. It is, however, coincident with the maximum of the total count of organisms. To this last total *M. granulata* contributes largely since it is the most abundant local planktont at Stations II and 111. Owing to its large numbers it also contributes a very considerable mass.

There was a good deal of variability in this species. Spines varied from very coarse, prominent projections to none. Granulation was very prominent in some cases, absent in others. There was a wide variation in size. This was so great that for a time a small form was listed as *M. granulata A* and counted separately (tables 1–3). By so doing the main count was fairly well restricted to the more nearly typical *granulata* and to the variety *spinosa*. Sometimes these seemed to be nearly equal in numbers but usually the spinous form was less noticed than the other.

Various encumbrances of the filaments were common. None of these were certainly identified. The only one counted was a small Rotifer egg listed as *Diurella* sp., by guess.

No effort was made to determine the average number of cells in a filament but it was probably not less than five. The cells composing a filament were much longer in proportion to width than they were figured in the literature consulted. A common form about the time of maximum numbers had cells about five times as long as wide.

Melosira varians Ag.

	Station I	Station II	Station III	Daily	Hourly
Average	4,682	233,227	93,884	619	9,123

Identification satisfactory. Losses through net heavy. Occurrence at Station I quite irregular in small numbers, with a maximum in April. Main production at other stations in first six months, two or three misses after that time at both. Maximum at last of May in Station II after steady increase for several weeks. Maximum in March at Station III, appearing rather abruptly. Recurrent pulses at two to six weeks intervals at both stations. A large September pulse is only indication of response to conditions similar to those of *M. granulata.* In fact the most favorable temperature seems to be near 18° C. or between 12° C. and 20° C. There is a strong pulse in late December at Station II which follows about a month of temperatures below 10° C. Hence it is certain that the two species are distinctly different in the responses to temperature. While *M. varians is* overshadowed in productiveness by *M. granulata,* it is yet to be reckoned an important planktont here.

Navicula affinis Ehrbg.

Identification doubtful. Losses through net heavy. Recorded eleven and eight times at Stations II and 111 respectively in rather small numbers. Not sufficient data for discussion.

Navicula alpestris Grun.

	Station I	Station II	Station III	Daily	Hourly
Average	6,746	76,645	29,979	3,929	55,357

Identification doubtful. Losses through net very heavy. Occurrence at Station I in small numbers and very scattering through the year. Not much better record at Station III. Appears in March at Stations II and III. Maximum at Station II on May 31 after two months of fairly steady increase, followed by slow decline to August. Seems to be favored by moving water. Its long continued presence seems to indicate that it is a true planktont, and it is probably of considerable importance.

Navicula bacillum Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	56,910	169,399	42,869	16,079	65,103

Identification doubtful. Percentage retained by net must be very small. It may seem a waste of time to list so many diatoms of uncertain identity, especially of the smaller forms, but it is the writer's opinion that to do so may serve two purposes: first, to give a faint idea of the large number of forms present; second, to show how very many forms there are beyond the reach of ordinary quantitative methods. For example the small diatom listed under this present heading was quite probably present in one hundred times the numbers recorded, possibly more. It appears in April at all stations and is erratic in appearance and numbers after that. The maximum appears in September at Station I and Station III but in June at Station II. In the circumstances no safe conclusions can be drawn from such a small organism.

Navicula didyma Ehrbg.

Identification doubtful. Losses through net heavy. Recorded once at Station I, ten times at Stations II and III, always in small numbers.

Navicula dubia Ehrbg.

Identification doubtful. Losses through net heavy. Recorded six times at Station I, four times at Station II and five times at Station III in small numbers.

Navicula gracilis Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	209,568	722,906	1,514,448	166,204	1,177,953

Identification uncertain. Losses through net very heavy. Recorded in every month at all stations. Maximum in August at all stations on a rather abrupt rise in numbers. Certainly favored by higher temperatures and quiet water but hindered by sewage. These points are shown by the remarkable development at Station III with quiet water but with little sewage and by the fact that the large numbers shown by Station II through May probably came from the washing out of some sloughs where there had been a time of quiet just preceding. Recurrent pulses are fairly well marked. This form is evidently very important numerically. The count may include several species.

Navicula sp.

Under this head are included a number of forms thought to be *Navicula*. Some of these were first recorded as *N. oblonga, N. pusilla, N. rhomboides* and *N. smithii,* but the numbers were few and the identity uncertain, so it was more convenient to place them this way. There is nothing of particular importance to be obtained even from the combined record.

Navicula viridis Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	169	27,659	4,488	....	985

Identification satisfactory. Losses through net probably heavy. Numbers very small at Stations I and III. Maximum in May at Station II where the numbers were larger and there were few collections showing none. For purposes of discussion it is unfortunate that the only *Navicula* named with confidence presents too few numbers to warrant much attention.

Nitzschia acicularis Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	2,878,662	316,042	476,223	4,390,368	600,166

Identification satisfactory. Probably very small percentage retained by net. Present throughout the year at all stations. Maxima in June at Stations I and II, in late August at Station III. Numbers well sustained through summer at all stations, with a conspicuous September pulse. Evidently a summer planktont favored by temperatures above 20° C. Just as evidently favored by the sewage at Station I as shown by the enormous averages there in comparison with the averages at other stations. Recurrent pulses fairly well marked. Certainly of great numerical importance though its small size would keep the volumetric showing low.

Nitzschia spp.

Under this heading are discussed four or more species of *Nitzschia* all but one of which are doubtful as to identification. *Nitzschia angularis* was satisfactorily determined but *N. sigma, sigmoidea* and *vermicularis* were all somewhat doubtful, at least sometimes. They were all listed separately in the tables but the occurrence was so erratic and the probable losses from the net so heavy that it hardly seemed worth while to attempt to draw any conclusions from the records of any of them. It might be noted, however, that all *Nitzschia* are favored by higher temperatures, but that none of these do well in sewage, *N.*

acicularis being exceptional in that respect. It may also be the only true planktont, all the others being adventitious.

Pleurostauron parvulum Grun.

	Station I	Station II	Station III	Daily	Hourly
Average	34,372	261,925	149,609	310	28,521

Identification probable. Probably very small percentage retained by net. Almost entirely absent from Station I through July, August and September. Few during last half of year. Maximum in May at Stations I and II and in March at Station III. Heavier representation in first half year at all stations. Hence it appears to be favored by flood waters and lower temperatures. Larger numbers at Station II and III indicate bad effects of sewage at Station I. Must be of numerical importance.

Stauroneis phoenicenteron Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	115	5,746	1,320	....	8,138

Identification satisfactory. Losses through net probably heavy. Found at various times of year at all stations but in small numbers. Recorded only six times at Stations I and III. Maximum in May at Station II. Probably adventitious.

Surirella spp.

	Station I	Station II	Station III	Daily	Hourly
Average	14,270	753,747	404,242	12,303	305,828

Genus identification certain. Probably at least four species included under this heading. Losses through net heavy. Present through year at all stations. Maximum in August at Stations II and III. The representation at Station I was light and scattering and though the maximum came in May it cannot be considered very important, especially since large pulses came at that time at the other stations. This planktont is evidently favored by temperatures above 20° C. and retarded by sewage. Both in numbers and volume it makes an important contribution to the plankton population.

Synedra radians Kütz.

	Station I	Station II	Station III	Daily	Hourly
Average	389,043	144,508	194,502	1,126,141	486,236

Identification doubtful. Probably very small percentage retained by net. This is one of those very small forms so difficult to handle in a count. Its appearance on the record at mid-July is simply due to the fact that its continued presence seemed to demand some definite notice. The occurrence before that date must be ignored because of failure to decide to record it. There is enough record to indicate that it is a warm weather form and not nearly so well represented in the colder months.

Synedra ulna Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	655,730	730,339	744,781	2,351,197	305,169

Identification uncertain. Probably includes at least three or four other species with possibly some similar genera. This probably accounts for the similarity of numbers and distribution at all stations. Maximum in August at Stations II and III, in June at Station I with a large pulse in August. Certainly favored by higher temperatures. Losses through net heavy. An important local planktont.

Tabellaria spp.

Identification of genus satisfactory. Occurrence at all stations rare. Evidently unimportant here. It was thought that both *T. fenestrata* and *T. flocculosa* were recognized a few times. This genus is apparently no more at home here than Kofoid (1908) reported it to be in Illinois.

The following forms of Bacillariaceae were recorded only once or twice at the three stations, or were thought to be recognized in living material:

Amphora coffeaeformis Ag. Once, I and twice, III.
Amphora sp. Once, I and III.
Cocconeis placentula Ehrbg. Once, II.
Cocconeis sp.
Coscinodiscus sp. Once Stations I and III and daily.
Cyclotella schroeteri Lemm. Once, I.
Cymbella helvetica Kütz. Once, II and III.
Cymbella lanceolata Ehrbg.
Cymbella parva W. Sm. Twice, I, once at II and III.
Cymbella pusilla Grun.
Cymbella prostrata Berk.
Denticula sp.
Diatoma sp.
Diatoma vulgare Bory. Twice, I, once at III.
Diatomella sp. Grev. Once, I and II.
Epithemia granulata Ehrbg.
Epithemia sorex Kütz. Once, III.
Epithemia sp.
Epithemia turgida Ehrbg. Once, II.
Eunotia flexuosa Kütz. Once at Station I, twice at III.
Eunotia major W. Sm. Once, III.
Eunotia pectinalis Kütz.
Fragillaria mutabilis.

Gomphonema acuminatum Ehrbg. Once, III.
Gomphonema olivaceum Lyngb. Twice, III.
Gomphonema subclavatum Grun.
Gyrosigma attenuatum Kütz. Once, III.
Mastogloia braunii Grun. Twice, II and III.
Mastogloia sp. Once, II.
Melosira subflexilis Kütz. Once, II.
Navicula helvetica J. Brun. Once, III.
Navicula lanceolata Kütz. Once, II.
Navicula oblonga Kütz.
Navicula pusilla W. Sm.
Navicula rhomboides Ehrbg.
Navicula smithii Breb.
Nitzschia dubia W. Sm. Once, II.
Nitzschia gracilis Hantzsch. Once, III.
Pinnularia acrosphaeria Breb. Once, III.
Pleurostauron obtusum Lagerst. Once, I and II.
Rhizosolenia longiseta Zach. Once, I and III.
Rhopalodia gibba O. Müll. Once, I, twice, II.
Rhopalodia paralella O. Müll. Once, II.
Stephanodiscus sp. Twice, I, once, II.
Surirella spiralis Kütz. Once, II.

The following list of forms, identified by Professor C. J. Elmore of Grand Island College in Nebraska from material collected in 1915 and sent to him for naming, will prove of interest for comparison.

Achnanthes lanceolata (Breb) Grun.
Amphora ovalis.
Asterionella gracillima Heib.
Amphiprora ornata Bailey.
Bacillaria paradoxa Gmel.
Ceratoneis arcus Ehr.
Cocconeis pediculus Ehr.
Cyclotella meneghiniana Kütz.
Cymatopleura solea (Breb) Grun.
Cymatopleura elliptica (Kütz) W. Sm.
Cymbella gastroides Kütz.
Cymbella lanceolata.
Cymbella pusilla.
Diploneis (Navicula) elliptica.
Encyonema turgidum (Greg) Grun.
Epithemia gibba (Ehr) Kütz.
Epithemia ocellata Kütz.
Epithemia turgida Ehr.
Eunotia robusta.
Fragilaria capucina Desm.
Gomphonema montanum.
Gomphonema constrictum Ehr.
Gyrosigma kützingii (Grun) Cl.
Gyrosigma parkerii.
Gyrosigma scalproides (Rabenh) Cl.

Gyrosigma spencerii (W. Sm) Cl.
Homoeocladia (Nitzschia) acicularis.
Homoeocladia amphioxys.
Homoeocladie obtusa.
Homoeocladia sigma.
Homoeocladia spectabilis.
Homoeocladia tryblionella.
Melosira granulata (Ehr) Ralfs.
Melosira crenulata Ehr.
Melosira distans. Kütz.
Melosira varians Ag.
Navicula ambigua.
Navicula borealis.
Navicula cryptocephala Kütz.
Navicula iridis.
Navicula fulva.
Navicula lanceolata Kütz.
Navicula parva (Ehr).
Navicula pupula Kütz.
Navicula pygmaea.
Navicula rhynchocephala Kütz.
Navicula viridis (Nitz) Kütz.
Nitzschia vermicularis Kütz.
Odontidium elongatum (Ag) Kuntze.
Sphinctocystis librilis.
Stauroneis anceps.
Stauroneis phoenicenteron.
Surirella biseriata.
Surirella ovalis.
Surirella robusta.
Surirella spiralis.
Synedra acus Kütz.
Synedra capitata.
Synedra radians Kütz.
Synedra ulna Ehr.
Tabellaria fenestrata Kütz.

Conjugatae

	Station I	Station II	Station III	Daily	Hourly
Number of forms listed....	10	15	13	5	5
Average number of individuals per cubic meter	121,653	331,687	420,463	26,827	931,948

The representation for this group is mainly desmid but there were a few filamentous forms such as *Spirogyra* included occasionally. These latter occurred in such small quantities, however, that they had no appreciable volumetric effect and the count serves to show their relative importance quite clearly. Including one form of *Spirogyra* there are seven species of Conjugatae listed here which will be given separate discussion. Even among the desmids the number of individuals was not great.

Discussion of Species

Closterium acerosum Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	539	7,108	6,161	206	10,961

Identification uncertain. Losses through net probably large. Occurrence rare, irregular and in small numbers at Station I. Found at almost all times of year at other stations. Maximum in September at both. Evidently favored by higher temperatures.

Closterium acuminatum.

Identification doubtful. Recorded three times at Station II and five times at Station III.

Closterium rostratum Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	21,580	8,322	4,494	929	3,045

Identification satisfactory. Losses through net probably large. Recorded only seven times at Station II, five times at Station III and occurrence rare at Station I until late summer. Maximum at Station I in August. Distinctly a summer planktont. Apparently favored by sewage.

Mougeotia sp.

	Station I	Station II	Station III	Daily	Hourly
Average	75,517	262,429	269,657	23,118	793,870

Identification of genus satisfactory. This was decidedly the most abundant of the filamentous Conjugatc. Rather prominent at all stations in July, August and September with maximum in last week of August or first of September. Not found often or in large numbers at other times. Favored by temperatures above 20° C. and somewhat hindered in development by sewage.

Spirogyra protecta Wood.

Identification uncertain. Occurred once at Station I, five times at Station II and nine times at Station III. Never in very large numbers. So far as catches show it is unimportant in every way.

Staurastrum sp. *A.*

	Station I	Station II	Station III	Daily	Hourly
Average	8,741	97,529	128,529	1,548	87,419

Genus certain. Species description not found in any literature available. Only the more voluminous references at the University of

California have been consulted, however. This *Staurastrum* is the most delicate and graceful of any ever observed by the present writer. Losses through net probably very heavy. Occurrence as recorded at Station I, small in numbers and scattered; May is the only month yielding none. More abundant at other stations but missing in January and May. Maximum in September at all stations. This comes after several weeks of strong development at Stations II and III. Evidently favored by higher temperatures, 20° C. or above, but hindered by sewage. Probably of considerable importance in summer.

Staurastrum spp.

	Station I	Station II	Station III	Daily	Hourly
Average	3,566	38,901	37,338	826	12,207

Probably three or more *Staurastrum* are included under this heading. There were a large number of different kinds found at various times at different stations. All seem to be rather closely confined to the warm season and to the water with least sewage.

The following forms of Conjugatae were recorded only once or twice or were thought to have been recognized in living material.

Closterium gracile Breb.
Closterium lineatum Ehrbg. Once, III.
Closterium lunula Ehrbg. Once, II, and III.
Closterium obtusum Breb. Once, II.
Cosmarium botrytis Menegh.
Cosmocladium saxonicum DeBy.
Didymoprium sp.
Docidium sp.
Sphaerozosma vertebratum Ralfs.
Spirogyra fluviatilis Hilse. Once, II.
Spirogyra majuscula Kütz. Once, II.
Spondylosium depressum Arch.
Staurastrum alternans Breb. Once, III.
Staurastrum cuspidatum Breb.
Staurastrum eustephanum Ehrbg. Once, I and Daily.
Staurastrum macrocercum.
Staurastrum vestitum Ralfs.
Xanthidium sp.
Zygnema sp.

CHLOROPHYLL BEARING ORGANISMS

So few flagellates were found that were clearly non-chlorophyll bearing, there was so much difficulty in separating the two types, and the characteristics of the Mastigophora so clearly resembled those of the algae, that it was finally decided to give a list of totals of algae (except Bacteriaceae) plus Mastigophora under the heading of chlorophyll bearing organisms (tables 1–5). This plan was also followed with the graphs in plates 3 to 6. A separate list of algae is given under headings of Total Phytoplanktonts (text table 1, p. 31), but no graph was made for it as the slight apparent difference did not seem to warrant it.

It will be noticed that this combination shows marked coherence through the year. There is a rather prominent pulse in every month through the first nine months at Stations I and II and in almost every month at Station III. There is steady increase in numbers from May to September at Stations II and III followed by a steady decline to the end of the year, and at Station I the numbers were well maintained from May to September with a steady decline following. The most striking difference in the three stations concerns the maxima. The maximum came in June at Station I and in September at the other two. The June maximum at Station I was due, however, to the enormous numbers of *Cyclotella* at that period. With *Cyclotella* exerting less influence on the totals or entirely omitted, the general features of occurrence look much the same at Station I as at the other two stations.

The response to higher temperatures is quite noticeable at all stations, the larger numbers being especially characteristic of the time from June to November when the temperature was usually near or above 20° C. This, however, is also the time at which there was least disturbance of the water.

The recurrent pulses were very striking and may be conveniently illustrated by Station II where the dates and intervals ran as follows: January 19, three weeks to February 8, three weeks to March 1, four weeks to March 29, three weeks to April 19, four weeks to May 17, three weeks to June 7, three weeks to June 28, five weeks to August 2, three weeks to August 23, two weeks to September 6, five weeks to October 11, seven weeks to December 6.

Fluctuations at Station II and III also showed a very close correspondence with the volumetric record. This is probably because the algae and Mastigophora furnished a large part of the volume at those stations (plates 1, 4, 5). Such a conclusion is supported by the fact that there is no such correspondence at Station I where the Rotifera and Entomostraca furnish much of the volume (pl. 1, 3).

PROTOZOA

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	75	53	59	26	34
Average number of individuals per cu. meter	5,194,416	3,494,065	3,634,131	3,880,462	7,908,872

The number of forms recorded is 116 but that is certainly considerably less than the real number of species. Identification was very difficult, not only of species but of genera. Many species were indistinguishable under conditions of counting and some that were recorded for a time were abandoned later when high power study showed how great the error was. Distortion of preserved material was a great factor affecting accuracy of counting of Protozoa. Even such strikingly different species as the two stentors, (*S. coeruleus* and *S. niger*) could not be separated with full confidence during the count. For these reasons the list of Protozoa shows more often than that of algae names which include several forms within rather ill defined limits.

Notwithstanding the great diversity of characteristics shown by several prominent protozoan planktonts, the distribution of totals through the year at different stations deserves some attention. The totals of non-flagellated Protozoa at all stations agree in that there is light representation in January, February and December, with an equally well defined heavy representation from May or July to mid-November. Station I averages about 60 per cent higher on its totals than either of the others but its maximum is only slightly greater. The maximum for Station I falls on August 13 but it is almost equalled by a similar pulse in November. The maximum for Station II comes on October 4 and for Station III on August 15, but the latter record is almost equalled by a further pulse on October 4. There is then substantial agreement of all stations in making the best showing as to large numbers and continuity of numbers in late summer and through autumn, when temperatures are rather high, the water quiet and the organic content great.

The inclusion of the Mastigophora with the Protozoa almost destroys the definiteness referred to above. Such a combination shows at Station I a fairly well marked pulse in January, another in March and another in April, followed by a steady increase up to the maximum on September 9. There were then two moderate pulses on the decline, which was otherwise fairly steady to the end of the year. At

Station II there were prominent pulses in January, February, March, May, July and October, while at Station III the prominent pulses came in February, March, April, July, August, September and October. It is thus apparent that the combined history is considerably different at the different stations and that the inclusion of the Mastigophora destroys the coherence of the Protozoa as a group. The totals are given both with and without the Mastigophora in tables 1 to 5 and the reader may suit himself with the list of his preference. See also Plates 12-14.

Mastigophora

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	33	30	31	20	20
Av. number per cu. meter..	3,708,569	2,629,112	2,631,702	1,853,429	3,931,892

Almost all of the Mastigophora were too small to be retained by the silk net to any great extent. This is probably the main reason for the fact that the averages recorded are exceeded from twenty-five to forty times by Kofoid's averages (1908) in Illinois. It is certainly true that other factors might be expected to operate, as mentioned before in this paper, but this is so obviously sufficient in itself to account for the difference that it seems useless to inquire further.

Mastigophora were present at all stations throughout the year, although the numbers were quite small for the first few catches. This may be partly due to the fact that the net used before January 15 was of slightly larger mesh than the regular number 25 which was ready by that date. By far the larger proportion of the flagellates came in the last six months, even December showing much more than June. There were, however, two or three strong pulses in January and February at all stations. Hence the general indication seems to be that quiet water or even stagnation is about as important as temperature in controlling production. The greater numbers at Station I also indicate that sewage is favorable to this group. The maximum at Station I was reached in September, at Station II in October and at Station III in November. These dates are largely due to *Chromulina* sp., a form very unreliable for suggesting conclusions, both on account of its small size and the uncertainty of identification.

The recurrent pulses of Mastigophora were not so distinct as they were in the case of the total chlorophyll bearing organisms. The semi-weekly collections at Station I seem to obscure them rather than make them more distinct. At any rate the intervals vary from eleven to forty days in a rather indefinite way. Indications at the other two stations are not much better. Evidently we have again too much influence of *Chromulina* in the record. Since the only other flagellate showing very large numbers is *Trachelomonas,* itself very small, it seems hardly worth while to attempt any conclusions from net collections.

Discussion of Species

Ceratium hirundinella O. F. Müll.

Identification satisfactory. Loss through net probably very heavy. Occurrence rare and in small numbers, four times at Station I in September and October. Five times at Station II in June, July, August and September. Three times at Station III in July, September and October.

Cercomonas crassicauda Duj.

Identification satisfactory. Loss through net very heavy. Occurrence rare and in small numbers. Recorded at Station I nine times at wide intervals from July to the end of the year. Twice at Station II in July and September. Five times at Station III in June, August and September.

Cercomonas sp.

Identification of genus doubtful. Recorded seven times at Station I in August and September, and once at Station III.

Chlamydomonas sp.

Identification of genus doubtful. Recorded eight times at Station I from July to December, five times at Station II from May to October and twice at Station III in February and May.

Chromulina spp.

	Station I	Station II	Station III	Daily	Hourly
Average	2,760,969	2,225,384	2,241,982	4,136,123	30,256,512

Identification uncertain. May include various minute genera not readily distinguished while counting. Percentage retained by net surely very small. Found in every month at all stations but occasionally not recorded in the first half year. Constantly present after July. Maximum at Station I on September 13, Station II on October 26, and Station III on November 22. Evidently favored by warm and quiet water and not much affected by sewage.

Cryptomonas sp.

Identification doubtful. May be confused with some other forms. Loss through net heavy. Recorded at Station I in considerable numbers in latter part of year. Only once at Station II and four times at Station III. Distinctly favored by sewage and low temperature but relatively indifferent to quiet water by this showing, which agrees pretty well with Kofoid's findings (1908) in Illinois.

Dinobryon sertularia Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	....	11,481	9,993	....	....

Identification of species frequently uncertain. Loss through net probably large. Occurrence rare at Station I and in small numbers of colonies at that. Recorded eleven times at Station II in four, well marked groups at the last of March and May, first half of June and through most of November. Maximum in May and June. Recorded frequently at Station III from March to July and again in November. Absent at other times. Favored by cooler water or flood time and hindered by sewage. Although the numbers here were small the distribution resembles that recorded for Illinois most remarkably. On the present showing it cannot be regarded as a very important planktont here. While not followed very far, the general impression given by the condition of the colonies here leads to support of Kofoid's contention (1908) that the synonymy of this species has been needlessly extended and that all the variant forms might be included under one species name with advantage.

Eudorina elegans Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	11,277	84,275	71,776	9,351	376,375

Identification usually certain. Found throughout the year at Stations II and III with only six scattered periods of absence at each. Numbers much smaller and absences more apparent at Station I where it was only twice recorded in May, entirely absent in August and most of September, last half of October and first half of November. Evidently deleted by sewage. Maximum in October at this station, on August 9 at Station II and III. Contrary to the Illinois record the period of greatest abundance in our river is in the warmest season and almost at greatest stagnation. The complete absence at Station I at this time, however, may throw some light on the Illinois situation. Either the sewage is more injurious to this organism in warmer weather or else its enemies multiply faster under such conditions and so keep it down. The substantial agreement of Stations II and III upon such a point in opposition to Station I makes it almost certain that sewage or organic content is in some way a more influential factor than temperature in the warmer season. There are some indications of recurrent pulses at all stations but they cannot be readily followed through the year. Parasitized colonies were frequently found, especially through the warm season. *Eudorina* is evidently a more important planktont here than in Illinois except at Station I where it is about the same.

One experience in collecting at Station I gives some interesting evidence as to the occurrence of swarms. The regular collection was taken near shore from the boat landing, one morning about 8 o'clock. On examination of the living material under the microscope after reaching home it was found to contain unusual quantities of *Eudorina*. It seemed a favorable time to make a special collection to send to Professor Kofoid so another trip was made to the same spot and hauls taken as nearly as possible in the same way as before. Although there had been a time interval of less than two hours scarcely any *Eudorina* could be found anywhere about. Weather conditions had not changed and there had been no great disturbance of the water by boats as it was on a Sunday morning when the traffic was light.

Euglena deses Ehrbg.

Identification satisfactory. Loss through net heavy. Recorded at Station I five times and once at Station II.

Euglena viridis Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	51,693	11,782	13,592	306,464	28,975

Identification satisfactory. Probably very small percentage retained by net. Occurs mainly in summer and early fall at all stations. Maximum in July at Station I and III, June at Station II. Apparently favored by sewage, quiet water and temperatures above 20° C. Information from silk net catches not reliable beyond this.

Hemidinium nasutum St.

	Station I	Station II	Station III	Daily	Hourly
Average	535,079	28,482	26,967	228,971	293,432

Identification doubtful. Very small percentage retained by net. Recorded only in last half of year at all stations, possibly because not definitely distinguished before. Very few at any station after mid-October. Far more numerous at Station I than at either of the others. Certainly favored by temperatures near or above 20° C. by quiet water and by sewage.

Mallomonas sp.

Identification of genus certain. Recorded three times at Stations I and III in small numbers.

Pandorina morum Bory.

	Station I	Station II	Station III	Daily	Hourly
Average	2,752	16,804	15,457	103	102,150

Identification satisfactory in most cases. May sometimes include young colonies of *Eudorina* or *Pleodorina*. Probably some loss through net. Occurrence at Station I frequent in small numbers through first three months, after that at irregular intervals usually several weeks apart. Fewest in warmer months. Maximum on March 26. At Station II most constant occurrence was through February and March in moderate numbers. Maximum of 105,792 reached in each of the four months of June, July, August and September. At Station III fairly constant in February and March, November and December. Records grouped at irregular intervals between. Maximum in May. Although the records differ strangely at the three stations it seems fair to infer that sewage is deterrent, especially during stagnation but that warmer waters are favorable if stagnation could be avoided. It is possible, however, that the organism was not captured so constantly in warmer waters because those were the quiet waters, hence there were no currents to mix it through the whole body of water. If this be true it is easy to see that the net might at one time traverse a "swarm" of the organisms but miss it entirely at another time.

Peridinium cinctum Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	34,262	5,209	18,732	111,324	12,207

Identification uncertain. Probably very small percentage retained by net. Occurrence rare in first half year at all stations. Recorded only six times at Station II and seven times at Station III. Evidently favored by sewage, since it occurred frequently in rather large numbers at Station I from late June to late November. Maximum apparently in July with most consistent record in September. Evidently favored also by temperature of 20° C. or over, and by quiet water.

Peridinium sp.

Identification of genus satisfactory. Species different from *P. cinctum* but not placed. Recorded four times at Station II three times at Station III.

Phacus pleuronectes Ntz.

	Station I	Station II	Station III	Daily	Hourly
Average	25,375	1,048	1,131	....	....

Identification questionable. Loss through net probably very heavy. Occurrence twice at Station II and thrice at Station III in small numbers. Recorded with only five exceptions at Station I through last three months of year. May have been overlooked before. Kofoid (1908) designates this genus and this species as a summer planktont. The failure of the record here to support fully this view may be due to small size and consequent inaccuracy with silk net catches.

Platydorina caudata Kofoid.

	Station I	Station II	Station III	Daily	Hourly
Average	431	3,569	5,020	206	48,290

Identification positive. Loss through net considerable. Occurrence quite distinctly limited both by temperature and sewage. Recorded only six times at Station I, all at variable intervals from August 2 to November 1 and in very small numbers. Nine occurrences, mainly in August and September at each of the other stations. No case of occurrence in temperature less than 17° C. Maximum at Station I on September 2, Stations II and III on September 13. Considering the small numbers and the short period of occurrence, the similarity of occurrence at the three stations is most remarkable. All stages of development were found and special collections were made for Professor Kofoid in order that he might study some features of development.

Pleodorina californica Shaw.

	Station I	Station II	Station III	Daily	Hourly
Average	123	21,231	6,282	413	67,751

Identification certain. Probably most of the matured colonies were retained by the net. Recorded only twice (in August) at Station I. Evidently strong sewage is deterrent though Kofoid (1908) mentions sewage as probably a factor leading to larger numbers in 1897 than in 1898. Station II showed the only consistent development of this organism. After being recorded in mid-June it was not found until three weeks later when it began an eight weeks period of steady increase to a maximum on August 31, followed by a three weeks decline, after which there were three isolated records. Station III showed no distinct maximum but the nine catches were distributed over about the same period from July to mid-November. It seems clear enough then that too much organic matter, and possibly too great stagnation, is detrimental and that the optimum temperature is above 20° C.

Pleodorina illinoisensis Kofoid.

Identification uncertain. Probably some loss through net. Recorded once at Station I, twice at Station II and four times at Station III, all in small numbers. A puzzling thing about this form is that when examining fresh catches in 1913 the writer was sure he found it frequently and in considerable numbers. Hence he was somewhat surprised at not finding it readily while counting. About the only conclusion possible is that it is very hard to distinguish this form from *Eudorina elegans* in preserved material. Chodat (1902) and others would doubtless say that this fact supports their view that *P. illinoisensis* is only a stage of development of Eudorina.

Pteromonas sp.

Identification probable. Loss through net heavy. Occurrence irregular and rare. Recorded ten times at Station I between June 21 and October 8, three times at Station II and twice at Station III. Apparently favored by sewage, stagnation and higher temperatures.

Spondylomorum quaternarium Ehrbg.

Identification certain. Loss through net heavy. Occurrence very rare in small numbers. Recorded twice at Station I, once at Station II.

Synura uvella Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	6,415	30	4,462	5,222	....

Identification uncertain. Colonies only counted. Loss through net probably very heavy. Occurrence greatest at Station I but at wide intervals there. Numbers recorded usually rather small. From our records it seems to do best at about 20° C. Maximum at Station I in August. Also evidently favored by sewage and stagnation, since it is recorded only once at Station II and five times at Station III. Certainly much less important than in Illinois, even with full allowance for escape through the net.

Trachelomonas euchlora Lemm.

	Station I	Station II	Station III	Daily	Hourly
Average	14,295	21,739	30,180	7,032	56,965

Identification uncertain. Small percentage retained by net. Found frequently in first half year at all stations. Rare in second half year. Warmer waters, sewage and stagnation seem to be deterrent, since numbers were smallest at Station I and during the period from June to October.

Trachelomonas volgensis Lemm.

Identification probable. Loss through net very heavy. Recorded five times near last of year at Station II and six times at Station III.

Trachelomonas volvocina Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	268,091	134,297	180,692	179,473	512,684

Identification uncertain. Loss through net very heavy. Recorded in every month at all stations. Maximum at Station I on August 20, at Station II on September 13, and at Station III on August 31. While a number of minor pulses are readily distinguishable at all stations, the percentage of loss is too uncertain to encourage conclusions. The maxima of the three stations coming so close together lead to the idea that temperature is an important factor for this form and that it does best above 20° C. The difference in averages listed above supports the view that sewage is beneficial and this is strengthened by the fact that several catches at Station I exceed the maxima at Station II and III. Stagnation seems favorable at all stations.

Volvox aureus Ehrbg.

Identification satisfactory. Recorded only at Station II, five times in August and September.

Volvox globator L.

Identification satisfactory. Recorded only at Station III twice, in September and December.

The following forms of Mastigophora were recorded only once or twice, or else they were thought to be present in fresh material:

Anthophysa sp. Once, I and Daily.
Chilomonas paramoecium Ehrbg.
Dinema sp. Once, III.
Diplosiga sp. All stations. Not counted because too small.
Diplosigopsis entzi France. Once, II.
Euglena acutissima Lemm.
Gonium pectorale O. F. M. Once, II and III and Hourly.

Gymnodinium sp.
Hyalobryon sp.
Mastigamoeba sp. Once, Station I, Station II and Hourly.
Oikomonas sp. Once, Station I.
Phacus longicauda Duj. Station I.
Salpingoeca sp.
Syncrypta sp. Once, Station II and III.
Uroglena volvox. Once, Station III and Hourly.

Rhizopoda

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	13	14	17	7	9
Average number of individuals per cubic meter	167,328	150,817	288,365	101,802	396,950

Rhizopoda, according to our records are from five to ten times as numerous as in Illinois. This is probably erroneous, however, since *Difflugia* contributes mainly to this showing and the *Difflugia* count includes an unknown percentage of *Tintinnidium*. Conceding this error to be very large, it still seems safe to say that the Rhizopoda were at least as important as in Illinois where Kofoid (1908) gives them a high rank because they are bottom living forms, actually present in far greater numbers than the catch of floating forms could possibly indicate. This adventitious character is just as strongly marked here as there, since all the recorded forms are irregular in distribution and erratic in occurrence. The group as a whole contributes most during the warmer season. This might be expected as a result of greater activity of the animals rendering them more liable to dislodgment. Larger numbers produced would also mean larger numbers dislodged. Heavy food supply would also account for it in part because, as Kofoid (1908) says, it means greater oil and gas production in the body of the animal thus reducing the specific gravity.

Discussion of Species

Amoeba proteus Rösel.

	Station I	Station II	Station III	Daily	Hourly
Average	2,782	14,487	3,645	206	61,034

Identification uncertain. Probably includes several species. *Amoeba proteus* was the large form most frequently observed and so the name is used as being probably most frequently correct. Occurrence rather irregular at all seasons of the year. All stations agree in showing the largest numbers at about the height of the warm season, i.e., in August at Stations I and II and September at Station III. All show only very small numbers in cold weather. Larger numbers at Station

II may be due not so much to favorable effect of clean water as to the slight flow in the river tending to greater dislodgment.

Amoeba radiosa Duj.

	Station I	Station II	Station III	Daily	Hourly
Average	18,202	11,528	17,852	206	12,209

Identification satisfactory. Losses through net probably great. Although Kofoid (1908) counts *A. radiosa* with *A. proteus,* it is given separate listing here because it was the one form that seemed to be always clearly recognizable under conditions of counting. Either singly or combined the two forms were decidedly more numerous than the combination was in Illinois, and this is true of all stations. *A. radiosa* was not recorded at any station until the last of April. It developed a small pulse at Station I in May, disappeared entirely in July and August but reappeared in considerable strength in September. The maximum came in a strong abrupt pulse in late October after which the form disappeared again showing only two small records in the rest of the year. At Station II there were two occurrences in April and May, one (the maximum) in September and a small series of four records in October and November. At Station III there were scattered records from July to a September maximum, a small group in October and November and one catch in December. In spite of considerable differences at the three stations the record shows a rather definite preference for water a little below the maximum temperature. The larger numbers at Station I indicate a preference for sewage. An almost equal number at Station III warns against too much confidence in such a conclusion, however.

Arcella vulgaris Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	238	523	1,790	103	....

Identification of species uncertain. Probably includes three or four species. Certainly there were marked differences in shells found. Not very important in our plankton so far as our records show. Occurred only seven times at widely separated intervals at Station I, four times in April and June at Station II, and six times at wide intervals at Station III. Numbers always rather small. Is known to be very abundant in ditches near Stockton. Clearly adventitious.

Cyphoderia ampulla Leidy.

Identification probable. Recorded five times at Station II, and four times at Station III in rather small numbers and at wide intervals. Clearly adventitious.

Difflugia corona Wallich.

Identification uncertain. Recorded three times at Station I, six times at Station II and twice at Station III, always in small numbers.

Difflugia pyriformis Py.

	Station I	Station II	Station III	Daily	Hourly
Average	76,692	51,957	43,846	71,508	28,483

Identification uncertain. Surely includes several other species certainly includes some *Codonella* and *Tintinnidium* which could not be readily distinguished while counting. This was especially true up to August before the presence of *Tintinnidium* and *Codonella* was noticed. In view of this error the record for *Difflugia* cannot be regarded as trustworthy. The variations in form are bewildering at best. As the record stands, the maximum seems to fall in June at all stations and Station I shows the largest numbers.

Hyalodiscus sp.

	Station I	Station II	Station III	Daily	Hourly
Average	26,286	15,566	22,818	....	144,447

Identification very doubtful. This form was not recorded until late in the season because it was small and hard to diagnose. It was finally decided to record it simply for the purpose of calling attention to considerable numbers of an organism frequently occurring which could not be definitely designated. The condition of the records does not warrant conclusions.

Microgromia socialis H. and L.

	Station I	Station II	Station III	Daily	Hourly
Average	23,280	56,487	72,004	15,976	61,034

Identification uncertain. Probably heavy loss through net. Occurrence at Station I in every month except January and December. Found mainly at the other stations in July, August, September and October. Evidently favored by warm weather and deterred by sewage.

The following forms were recorded only once or twice, or were thought to be present in fresh material:

Amoeba verrucosa Ehrbg. Once, II and III.
Difflugia acuminata Ehrbg. Once, II and III.
Difflugia globulosa Duj. Once, I and twice at III.
Euglypha alveolata Duj.
Hyalosphenia cuneata St. Twice, I.
Hyalosphenia papilio Leidy. Twice, I, once, II and III.
Nebela collaris Leidy. Once, III.
Pseudodifflugia gracilis Schlumbg. Once, III.
Quadrula symmetrica F. E. Sch. Once, III and daily.
Trinema enchelys Ehrbg. Once, III.

Heliozoa

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	8	6	10	4	4
Individuals per cu. meter..	370,995	257,232	274,580	619,156	441,478

While there were only a few species of Heliozoa recorded the numbers of some of the smaller forms were quite large and so make the group somewhat important. The extreme fragility under manipulation makes detailed examination somewhat untrustworthy in results and also invalidates the count more than in the other groups. Nevertheless the following records seem to be fairly satisfactory. Through some error in copying early lists, *Nuclearia* and *Vampyrella* were included with Rhizopoda. The numbers do not seriously change the totals in the two groups, however; the totals for Heliozoa have been left short by that much and the totals for Rhizopods show a corresponding excess.

Discussion of Species

Heterophrys fockei Arch.

	Station I	Station II	Station III	Daily	Hourly
Average	24,459	139,328	98,532	55,170	207,538

Identification uncertain. May include other species or other genera at times. Thought to be usually correct. Not recorded at any station before July. Not present at any after October. One of the most definitely limited organisms on our records. Limited to a period of about sixteen weeks with a peculiar break in the middle (last of August). This is a period in which the temperature was almost constantly above 20° C. Maximum numbers on August 2 at Station I, October 4, at Stations II and III. Smaller numbers at Station I indicate deterrent action of sewage.

Heterophrys sp.

Probably not deserving separate listing though this fact was not discovered until too late to change easily.

Nuclearia simplex Cienk.

	Station I	Station II	Station III	Daily	Hourly
Average	7,020	338	15,871	206	44,758

Identification uncertain. No records until late in the season, partly because overlooked until October, partly because of indecision as to advisability of recording. It was finally decided that some indication of the presence of an organism possibly belonging under this species name was desirable. No conclusions can safely be drawn as to distribution, however.

Raphidiophrys elegans H. & L.

	Station I	Station II	Station III	Daily	Hourly
Average	309,635	79,467	107,739	532,371	20,345

Identification probable. First recorded in April at Station I and Station III, in March at Station II. Constant in occurrence at Station I through June, July, August and November. Irregular at other times. Irregular at both the other stations except for a period through August and early September at Station II, late June and July at Station III. Evidently favored by higher temperatures and sewage, not so much by stagnation. From these records, seems to be a rather important constituent of our plankton. This is somewhat different from the condition at Illinois where it appeared only as a constituent of back waters.

The following forms were recorded only once or twice or were thought to be present in living material.

Actinosphaerium eichornii Ehrbg. Once, I and III.
Diplocystis sp.
Vampyrella sp. Once, III.

Ciliata

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	32	22	25	9	10
Number of individuals per cubic meter	946,762	447,909	431,445	1,306,075	3,136,583

Identification of ciliates was about as unsatisfactory as was that of the Rhizopoda and Heliozoa. This was due partly to distortion of preserved specimens and partly to small size. It is probable, however, that totals for the group are fairly accurate.

Members of the group were always found throughout the year, except for the first three and two collections at the first of the year at Stations II and III respectively. Unfortunately no general conclusions can be stated with full confidence from the totals of Protozoa because *Vorticella* sp. is too largely responsible for them. This was because *Vorticella* sp. was used as a sort of catchall for a miscellaneous assemblage of organisms which could not be readily distinguished under conditions of counting. Most of these were clearly *Vorticella* (nearly all of the short stem type) but some craspemonad flagellates and the like were undoubtedly counted in at times. In spite of these defects in the record, there is some reason for thinking that the group as a whole develops best in sewage water and in the higher temperatures with rather stable conditions. Since this does not agree very well with Kofoid's (1908) Illinois results and since the net error is undoubtedly great, too much importance must not be attached to such a suggestion.

Whatever the truth may be concerning their distribution there is no question that the Ciliata exert a very marked influence amongst local planktonts, especially in Stockton Channel. The larger Ciliata are quite conspicuous in the catches there in the colder months.

Discussion of Species

Askenasia elegans Bloch.

Identification probable. Recorded only at Station I four times in small numbers. Thought to have been positively recognized in fresh material, however.

Chilodon sp.

Identification doubtful. Recorded four times at Station I and twice at Station II in small numbers.

Coleps hirtus Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	7,338	3,052	4,149		

Identification certain. Loss through net heavy. Probably also overlooked in counting sometimes. Recorded ten times at Station I, five of which came in December. Recorded twice at Station II and once at Station III. Evidently favored by sewage and probably by temperature below 15° C.

Colpoda sp.

Identification very doubtful. Recorded at Station I five times in very small numbers, once at Stations II and III.

Cyclidium sp.

	Station I	Station II	Station III	Daily	Hourly
Average	29,530	10,234	6,286		24,414

Identification unsatisfactory. Referred to this genus purely on general resemblance to figures in reference books. No undulating membrane was visible under conditions of counting. Apparently a warm water form favored by sewage. Small percentage retained by net.

Didinium nasutum.

Average at Station I, 1,636.

Identification positive. Recorded sixteen times at Station I at irregular intervals January to April and in November. Only once at Station II and twice at Station III. Distinctly a cold water form. Probably heavy loss through net.

Euplotes patella Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	38,100	7,350	8,068	....	....

Identification of species fairly certain. Recorded in first three and four months and the last two months at all stations. Far more numerous at Station I. Distinctly favored by sewage and low temperatures. Spring maximum on March 19 at Station I at 14.5° C. Fall maximum on November 12, at 17.5° C. Disappearance in April at 20° C., reappearance in October at 19° C.

Euplotes sp.

Average at Station I, 3,567.

Recorded only twelve times at Station I (February 8–April 5), twice at Station II and three times at Station III. Showed same tendencies of distribution as preceding species. Probably variety of same.

Halteria grandinella O. F. Müll.

	Station I	Station II	Station III	Daily	Hourly
Average	3,390	....	126	206	12,207

Identification probable. Loss through net heavy. Recorded sixteen times in first three months and five times in the last three months at Station I, only five times at Station III. Apparently adventitious and not of much consequence here.

Hastatella radians Erlanger.

	Station I	Station II	Station III	Daily	Hourly
Average	2,245	32	96	....	....

Identification positive. Probably very small percentage retained by net. Recorded fourteen times at Station I, once at Station II and twice at Station III, in February, March, April and December. Distinctly a cold water form and almost as distinctly favored by sewage. Notwithstanding its small size this form is so distinct in appearance and so little deformed by preservation that the count is unusually trustworthy.

Holophrya sp.

	Station I	Station II	Station III	Daily	Hourly
Average	109,113	76,816	103,778	140,641	870,497

Identification very doubtful. This generic name was used as a catchall for a number of forms that might be referred to it without too great stretch of possibilities. They were usually too much deformed in preservation to give any definite clue to affinities. About all that can be safely said is that the assemblage is favored by warmer waters and stagnation, probably also by sewage.

Paramoecium aurelia O. F. Müll.

	Station I	Station II	Station III	Daily	Hourly
Average	10,931	1,415	941	....	....

Identification satisfactory. Loss through net probably heavy. Occurrence almost entirely limited to first two and last two months of the year. Hence distinctly a cold water form. Record at Station I fairly constant in periods mentioned, with a maximum in December. Numbers small and catches rare at Station II and III. Evidently does best in sewage, probably on account of quantities of bacteria for food.

Paramoecium bursaria Focke.

	Station I	Station II	Station III	Daily	Hourly
Average	9,785	4,254	439	....	....

Identification uncertain. Probably should be included with *P. aurelia* though there seemed to be some difference. Shows practically same characteristics of distribution as the former species.

Paramoecium caudatum Ehrbg.

Identification satisfactory. Although a few specimens of this type were found six times at Station I and once at Station III, it was probably not worth while to attempt separation. They are too few to signify much.

Pleuronema sp.

	Station I	Station II	Station III	Daily	Hourly
Average	5,402	3,052	16	....	....

Identification doubtful. Recorded thus as nearest possibility. Records indicate preference for sewage and cold water.

Prorodon sp.

	Station I	Station II	Station III	Daily	Hourly
Average	7,379	677	4,243	206	492

Identification uncertain. Occurrence almost entirely confined to first three months and last three months of the year, thus indicating the favorable influence of cold weather. Larger numbers at Station I were probably due to sewage.

Stentor coeruleus Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	8,141	123	141	....	492

Identification usually satisfactory. Under conditions of counting probably some confusion with *S. niger* and perhaps another species. This was because distortion in preservation made it almost impossible to use any distinction except size in many cases, hence a small *S. coeruleus* might be mistaken for *S. niger*, or a large specimen of the latter might be mistaken for the former. Generally, however, the stouter body of *S. coeruleus* showed plainly enough to make it fairly certain. Occurrence was almost confined to first four months and December. Only two catches were recorded at Station II and three at Station III. Clearly a cold water form almost limited to sewage or at least to water with heavy organic content. Maximum occurred in December at Station I, although the catches were fairly constant over a period of four months from the first of the year. The maximum for this early period was in January. Since it is absent at periods of greatest stagnation, this planktont is evidently more influenced by temperature than by that factor. The most favorable temperature seems to be at about 10° C. since the maxima just mentioned come at about that condition.

Stentor niger Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	42,691	739	871	....	472

Identification satisfactory. Probably some loss through net. Also considerable loss of this and the preceding form through clinging to net, utensils, etc. This form was first recorded as *S. roeselii* on account of the nucleus, but the delicacy and grace of form together with smoky color seem so strongly characteristic that it has finally been referred to *S. niger*. The decision to make the change was mainly due to Professor Kofoid's statement that nuclear characters are very unstable in this genus. They cannot be determined at least while counting.

Occurrence at Station I runs later in spring and begins earlier in fall than that of *S. coeruleus*. The numbers are very noticeably greater in the fresh material while the animals are active. The January and December maxima fall on the same dates as those of *S. coeruleus* but there are strong pulses in April and May by way of contrast. It seems safe to say then that both species have about the same optimum but that *S. niger* is able to endure a slightly higher temperature (20° C.) and that it is less disturbed by flood conditions.

Tintinnidium fluviatile St.

	Station I	Station II	Station III	Daily	Hourly
Average	17,333	3,359	8,642	7,341	323,479

Identification uncertain. Loss through net probably heavy. For some reason (probably because intent on *Difflugia*) the writer entirely overlooked this form and that of *Codonella* until attention was forcibly attracted by some living material in 1914. This was after the count had progressed almost through the first seven months of 1913, hence it was too late to rectify by recounting. It was also impossible at that late date to distinguish the three forms readily in preserved material. Undoubtedly some *Codonella* and a few *Difflugia* are included under the present head. It is also probable that *Difflugia* includes some of both *Tintinnidium* and *Codonella* even after an attempt was made to differentiate them. *Codonella* was not successfully distinguished at all. The count as it stands yields very imperfect results. It appears certain, however, that *Tintinnidium* does best in heavy sewage. Since the river shows least of this species it is also probable that quiet water is favorable. So far as the evidence goes, it seems that higher temperatures are best.

Trichodina pediculus Ehrbg.

Average at Station I, 631.

Identification probable. Loss through net probably heavy. Occurrence at Station I almost entirely in first three and last three months. Recorded only once at Stations II and III. Small numbers everywhere. Surely a cold water form favored by sewage. Adventitious.

Vorticella longifilum Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	13,991	2,588	3,612	413	....

Identification doubtful. Count includes all individuals with very long and slender stalks. None were ever found attached to anything. Loss through net probably very heavy. Occurrence at Station I mainly in last three months. Catches in small numbers and at widely separated and irregular intervals at other times and other stations. Evidently a cold water form doing best in sewage and quiet waters.

Vorticella sp.

	Station I	Station II	Station III	Daily	Hourly
Average	623,067	274,328	300,528	1,153,087	1,797,514

Identification uncertain. Probably includes several species of short stemmed *Vorticella* and some craspemonad flagellates attached to various objects.

Those taken to be most typical of this miscellaneous assemblage were found on the bodies and appendages of Entomostraca, especially Cyclops. Most of these were large enough to be fairly accurately counted. In view of the miscellaneous character of the forms included, it is undesirable to draw definite conclusions. There is, however, a clear suggestion of preference for sewage and quiet water. Higher temperatures are also distinctly favorable for the assemblage and this is in marked contrast to nearly all the other ciliates.

The following forms were recorded only once or twice or else were thought to be observed in fresh material.

Aspidisca sp.
Bursaria sp. Twice I, once, III.
Carchesium sp.
Climacostomum virens St.
Condylostoma vorticella Ehrbg.
Didinium balbianii Btschli.
Enchelys sp. Twice, I, once, III.
Epistylis sp. Twice, II.
Frontonia sp. Twice, I, once, III.
Gastrostyla sp.
Glaucoma sp. Once, I.
Lacrymaria sp.
Loxophyllum sp. Twice, I.
Mesodinium acarus St.
Pyxidium cothurnoides Kent.
Rhabdostyla brevipes Cl. & L. Once, I.
Spirostomum sp.
Trachelius ovum Ehrbg. Twice, I.
Urocentrum turbo Ehrbg.

Suctoria

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	3	3	3	....	1
Number of individuals per cubic meter	762	8,995	8,039	....	1,969

Only three forms were recorded from this group and they occurred at all three stations but mainly in the last three or four months of the year. In no case were the numbers very large. While genera could not be identified with much confidence, it yet seemed clear that the forms recorded were Suctoria and that the generic designation was probable. Inasmuch as none of the three forms appeared to be a true planktont and the numbers were few, it seems hardly necessary to attempt detailed discussion. The most notable suggestion that can be made is that sewage seems unfavorable to all three forms. The following are the three forms recorded. See tables 1–5.

Acineta sp. Podophrya sp. Sphaerophrya sp.

ROTIFERA

Plates 3–6 and 15–17.

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded..	55	43	39	30	34
Individuals per cu. meter..	4,842,320	883,510	1,302,609	5,443,643	5,681,372
	Eggs 31%	Eggs 45%	Eggs 34%	Eggs 29%	Eggs 34%

These averages are made from records which include males, females, eggs attached, a few records of free eggs, winter eggs, male eggs and parasitized individuals. Further distinctions were not advisable because of inability to carry them through the count with accuracy.

Rotifera were found in every collection through the whole year at all stations. Only twice in the whole year did the numbers fall below 75,000 per cubic meter at Stations II and III, and at no time was a smaller number than 200,000 recorded at Station I. This makes a remarkably consistent showing, especially by way of contrast with Illinois conditions as found by Kofoid (1908). This consistency is even more striking than are the distinctly larger numbers found here at all stations. Both features are evidently due to the peculiar climatic conditions of this region. There is agreement with Illinois records in the fact that minimum production occurred in winter and the maximum in warmer weather, though much later there than at Station I. There is a difference in that the fluctuations were less extreme here, and that maxima occurred in November at Stations II and III.

Recurrent pulses were fairly well marked at all stations though the intervals were quite variable. These pulses were not coincident with those of any other group. The maximum number of Rotifera did not correspond in time with the maximum mass production of plankton at any station nor did it agree with any other group.

This group affords another illustration of a case in which a single genus exerts a remarkable influence on the whole group, the late maximum in November at Stations II and III being due to *Keratella*. Since, however, this same genus is largely responsible for throwing the Illinois maximum into May, perhaps those records and ours can be compared with some fairness.

Catches of 1,000,000 or near that number were rare at temperatures below 15° C. About eighty-seven forms of Rotifera were listed.

The names used have been checked as closely as possible to correspond with those indicated in Harring's *Synopsis of the Rotatoria*.

Rhizota

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	2	3	3	....	3
Individuals per cu. meter..	1,509	37,181	30,185	....	16,145

Practically all of the Rhizota found at any station were single individuals without tubes. Only two or three times were colonial forms recorded and then only part of the colony was present. These facts serve to emphasize the adventitious character of the Rhizota and to indicate that their presence in the plankton was due to broken anchorage. The large numbers at Stations II and III as compared with Station I suggest a decidedly deterrent influence of sewage.

Discussion of Species

Collotheca pelagica Rous.

	Station I	Station II	Station III	Daily	Hourly
Average	1,325	21,747	7,629	....	1,477

Identification uncertain. May include two or three species, one of which is possibly *C. mutabilis.* The preserved condition does not permit of very accurate judgment and the animals were usually without tubes. So many of the tubes which were seen were of a slender type that it was thought that they indicated the species designated. This form was only recorded at Station I six times (in small numbers), all in August, September and October with the largest number in October. Occurrence at Station II was from August 15 to November 22. Most of the catches were fairly large and there were only two failures to appear in that period. The largest number recorded was in August, due probably to some unusual disturbance of the water by barges or dredges.

Attached eggs of this genus and almost entirely of this form were recorded with averages as follows: Station I, 185; Station II, 14,288; Station III, 15,332. Although certainly adventitious, the combined numbers of eggs and adults make this form of some importance in the local river plankton for a brief period. It is not adapted to life in sewage, however.

The following forms were recorded only once or twice or were thought to be present in fresh material:

Collotheca ornata Ehrbg. Once, I and III.
Conochiloides dossuarius Hudson.
Conochiloides natans Seligo.
Conochilus hippocrepis Schrank.
Conochilus unicornis Rous. Once, II and III.
Cupelopagis vorax Leidy. Once, III.
Ptygura brevis Rous.

Bdelloida

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	6	6	3	3	2
Individuals per cu. meter..	349,312	47,105	56,806	120,831	225,414

These large averages are perhaps unfair, inasmuch as they are largely influenced by the assemblage of unidentified forms which was assigned to the Bdelloida because it seemed almost certain that all but a very few belonged to that group.

The only genus recorded is *Rotaria* and it is itself a heavy contributor to the plankton. Probably some other genera are included, especially in the unidentified list. The larger numbers at Station I indicate a distinct preference for sewage, a condition directly opposite to that of the Rhizota. The representation in February and March at Station I is much heavier than at any other time of year, the maximum falling on March 12. This is very largely due to the abundance of *Rotaria rotatoria*. The maxima at Stations II and III came in October and August respectively, due to the greater influence of the unidentified assemblage at those stations. It must be acknowledged that the data for this group do not lead to satisfactory conclusions. Some of the difficulty is due to the characteristics of the group and some to the difficulty of identification in preserved material.

Discussion of Species

Rotaria neptunia Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	14,987	2,331	3,829	1,961	492

Identification usually positive. Occurrence most constant in cooler months of the year at all stations. Much more abundant at Station I, thus showing preference for sewage. Not recorded in April, May and June at Station I and but rarely in July and September. Numbers small in March, species well represented in other months. Maximum number recorded twice, October 15 and November 5 at temperature of 18.5° C., which is probably near the optimum. Small numbers in early January were probably due to the temperature being below 10° C. Flood conditions may be responsible for absence in April, May and June while high temperature accounts for it in July. The reason for absence in September after being recorded in August is not clear.

While definite pulses were present, there is not much regularity of appearance.

At Station II this form was recorded in every month except February, April, May and June though the numbers were rather small throughout and the catches mostly at irregular intervals. The maximum occurred in October at a temperature of 20° C. and again at 17° C. Conditions were much the same at Station III except that April, June and July were the only months without catches. This again supports the conclusion that flood and higher temperatures are both deterrent factors. The maximum came in October.

While the habits of this organism would lead one to think of it as really adventitious in the plankton, the large numbers here raise a definite question as to the validity of that view. Can it be that this animal has adopted a free swimming habit under our local conditions? Or are the general conditions so favorable for development that favorite haunts become rapidly overcrowded thus forcing individuals temporarily into the plankton while seeking other quarters?

Rotaria rotatoria Pallas.

	Station I	Station II	Station III	Daily	Hourly
Average	287,186	19,099	18,283	54,197	8,500

Identification uncertain. Probably includes two or three other species and possibly other genera. So far as estimated from living material the above named species was more numerous; the others could not be distinguished from it while counting. Occurrence in every month of the year at all stations, though rather light in April, May and first half of June at each, and continuing so through June and July at Stations II and III. The maximum came in March at all three stations. The fairly rapid decline after the March maximum was apparently due to the incoming mountain flood waters. There was a marked pulse in July at the disappearance of these flood waters. Higher temperatures undoubtedly kept the numbers down, however, and none of the pulses of the last half year reached the numbers common in the first quarter year. This, of course, is also some indication that the comparative stagnation of the last half year was less favorable than the disturbed hydrographic conditions of the first three months when there was enough rainfall to cause considerable local variation. Comparison with the 1914 condition when there was heavier rainfall may help to settle some of these questions. The numbers clearly show that this form does best in sewage. There can be no question that it prefers temperatures below 20° C. and the indications are that it does best in waters slightly disturbed, as by local rains, but this cannot be settled now.

No other forms of Bdelloida were recorded.

Ploima

	Station I	Station II	Station III	Daily	Hourly
Number of forms recorded	47	34	33	27	29
Individuals per cu. meter..	4,491,499	799,224	1,215,618	5,322,812	5,439,813

Ploima were invariably present at all stations throughout the year. The averages given above include the eggs, of which there were about 30 per cent at Station I and Station III and over 40 per cent at Station II. While the numbers were always rather large they were especially so in temperatures above 15° C., the maximum at Station I occurring in June at a temperature of 22.5° C., in November at Station II at 19.5° C., in November at Station III at 17° C. A marked preference for sewage is proved by the exceedingly large numbers at Station I, median numbers at Station III and smallest numbers at Station II. The large numbers in late summer and throughout the autumn at all stations also indicate a favorable effect of stagnation.

The fact that all the Ploima show strikingly uniform characteristics of seasonal distribution, noted by Kofoid (1908) in Illinois is strongly in evidence here, especially amongst the forms occurring throughout the year. Plates 3, 4 and 5 give a graphic representation of the occurrence of the group as a whole (including eggs) accompanied by a similar graph for the chlorophyll bearers. This does not indicate any prominent relationship of the two groups. The following text table gives the more prominent pulses of Ploima at Station I (exclusive of eggs). Omission or inclusion of eggs does not affect the location of the pulses, hence eggs are not segregated from other records in totals at Stations II and III.

TEXT TABLE 2. STATION I

Date	No.	Date	No.	Date	No.
Jan. 15	258,268	Jan. 29	567,996	Feb. 12	1,985,200
Feb. 23	2,692,848	Mar. 12	9,577,280	Apr. 5	5,398,400
Apr. 19	6,526,912	May 11	9,936,352	June 3	4,359,872
June 25	13,717,568	July 12	5,979,752	July 26	4,649,952
Aug. 20	5,287,904	Sept. 13	5,353,600	Oct. 8	7,105,568
Nov. 19	802,848	Dec. 14	723,508		

It may be seen that of the seventeen pulses noted in this table eight preceded chlorophyll and algal pulses by from three to twelve days, usually three or four days. Coincidence occurred twice, and there were two cases in which ploiman pulses followed the others by a few days. In the other five cases no definite relation appeared. It therefore seems that there is no such clearness of relationship of pulses of Ploima and of chlorophyll bearers as was noted in Illinois

(Kofoid 1908). Inasmuch, however, as ten out of seventeen pulses came near to those of chlorophyll bearers it may be fair to assume that the two groups are in some way interdependent or that the general conditions favoring one likewise favor the other. The relationships at the other two stations were still less definite and it was not considered worthwhile to transcribe the tables of pulses of *Ploima* there.

Our records are at variance with the Illinois records in showing more pulses of *Ploima* to precede pulses of chlorophyll bearers than to follow. The discrepancy is probably due to the errors incident to escape of chlorophyll organisms through the net. But it might be due to a difference in the numerically dominant forms in the two regions or to some similar factor. The problem of difference cannot be solved, apparently, from the 1913 records, but after all there is sufficient likeness to warrant the conclusion that the two groups are closely inter-related, here as there. The daily record was too short to help in a decision on this matter.

Discussion of Species

Anuraeopsis fissa Gosse.

	Station I	Station II	Station III	Daily	Hourly
Average	10,251	8,411	18,507	2,477	40,066
Average eggs attached	1,786	30	3,078	....	985

Identification frequently satisfactory, more often uncertain. Probably some loss through net. Not recorded anywhere during first half year. Appeared at Stations I and II about mid-July, at Station III in August. Maximum at Station I in November, at Station II in August and at Station III in September. Occurrence frequent at Stations I and III in August, September, October and November, disappearing in December. Occurrence at Station II rare except in August. Apparently a form favored by warm and quiet water. Larger numbers at Station III suggest a preference for moderate quantities of organic matter in surrounding water.

All stations resemble Illinois in showing a distinct limitation of this form to a four months period after midsummer. It was recorded in June there and disappeared in early November. A single December record here at Station II indicates the possibility of occurrence in very small numbers at other times. The pulses came mainly at temperatures above 20° C., the single exception on November 22 possibly being due to confusion in counting.

Anuracopsis sp.

	Station I	Station II	Station III	Daily	Hourly
Average	8,230	308	4,619	....	26,867

Identification doubtful. Record probably includes two or three small forms with indistinct characteristics in the preserved condition. Referred to this genus as the nearest probability. May include distorted specimens of *A. fissa.* Since the only records of this form are in June and July at the three stations, it may be that the whole number should be transferred to *A. fissa.*

Asplanchna brightwelli Gosse.

	Station I	Station II	Station III	Daily	Hourly
Average	16,892	308	533	43,192	2,954

Species determination uncertain. Genus certain. Record probably includes at least two or three species under this heading, species segregation being too difficult during the count. Eggs not counted.

Occurrence at Station I regular from mid-March to November I. Maximum, 158,688, on July 5 but almost equalled in April and October. Recorded only three times at Station II in April, June and July in small numbers. Recorded five times at Station III from March to November in small numbers and at wide intervals. Distinctly favored by sewage and by temperatures near 20° C.

The record at Station I shows ten fairly distinct pulses, seven of which followed pulses of chlorophyll bearing organisms by from three to seven days, two of which coincided with such pulses, while one preceded. The correlation of these pulses is far the most impressive of any yet observed. The following table, text table 3, shows temperatures and pulses:

Text Table 3

April 9	18	132,240	April 26	20	41,600
May 11	21	44,800	May 27	23	51,200
June 7	25	44,800	July 5	26	158,688
Aug. 2	26	44,800	Aug. 15	23.5	76,800
Sept 13	25	51,200	Oct. 29	19	105,792

Asplanchnopus sp.

Identification doubtful. Recorded three times each at Stations I and II and six times in hourly series at Station III. Not important.

Brachionus.

Identification of the females of this genus was nearly always satisfactory as to genus but the separation of species was frequently difficult and sometimes impossible. Males were never positively recognized, hence species records were of females only. Eggs were easily identified when attached but the confusion was great when unattached. Probably eggs of other genera were often included amongst the free eggs. Eggs of species were not recorded.

Only seven species and one variety were recorded, although there were probably many more. The reference of many individuals to some of these species was somewhat arbitrary, but on the whole the eight groups were fairly definite in the writer's mind and may be properly discussed despite some technical error in identifying.

Since the eggs were only recorded for the genus as a whole their averages and the main features of their occurrence may be stated now.

TEXT TABLE 4

	Station I	Station II	Station III	Daily	Hourly
Av. female eggs attached	255,960	16,390	28,607	409,180	132,240
Av. male eggs attached....	26,190	2,773	4,443	4,238	22,806
Av. female eggs free..........	351,039	14,780	41,963	718,362	396,720
Av. male eggs free..............	817	....	157	....	....

In view of the uncertainty of identification of unattached *Brachionus* eggs either male or female, it is hardly worth while to attempt any detailed discussion of the records for these kinds. The maximum for both kinds of attached eggs came early in March at Station I. Occurrence of attached male eggs was scattered after March, though the female eggs were almost constantly present through the year. They almost reached the March maximum twice in September. At Station II there were only three records of male eggs, two coming in March. Occurrence of female eggs was fairly constant from June to October inclusive, infrequent at other times, the maximum coming in October. At Station III male eggs were recorded seven times, the maximum in March. The female eggs occurred rather regularly from February to October inclusive, excepting April, when there were none. The maximum came on October 4. About the only safe conclusion to be drawn from these inadequate records is that male eggs are most numerous in early springtime at all stations. It is, of course, unfortunate that the attached eggs were not segregated with the proper species, but the desirability of segregation was not realized until too late in the count.

Brachionus angularis Gosse.

	Station I	Station II	Station III	Daily	Hourly
Average	78,367	3,417	4,675	14,579	8,630

Identification usually satisfactory. Occurrence far most conspicuous in May and June at Station I, with maximum in mid-May. Missing in January, February, and December, rare in March, April, July, August and October. Occurrence at Station II from April to November inclusive, but scattered and in small numbers with a maximum in September. Limited to same period at Station III but regularly recorded during most of May and June with maximum in May, favored by sewage and by a temperature near 20° C. Stagnation seems to be detrimental.

The periods of regular occurrence were too short to give very well marked evidence of recurrent pulses.

Brachionus angularis caudatus B. and Da.

	Station I	Station II	Station III	Daily	Hourly
Average	323,532	65,243	70,480	830,657	1,284,905

Identification usually satisfactory. Sometimes hard to distinguish from type form of *B. angularis*. The separate record of this variety seems to have been worth while because of the tremendous emphasis which it gives to the continuity in occurrence of the two forms. The variety was almost wholly absent from the collections until the type form had passed the spring maximum. As the latter declined the former increased until it entirely displaced the other. This was strikingly true at all three stations. The variety also disappeared by November at all stations, at which time the type came in in small numbers for a few weeks. At Station I the maximum came on June 25 but was almost equalled in September. At both of the other stations the maxima came in August.

Recurrent pulses were very marked in the records for this form as shown by the following table:

Text Table 5

Station I	Station II	Station III
June 7		
June 25		
July 12	July 12	July 12
July 26		
Aug. 20	Aug. 15	Aug. 2
Sept. 9	Sept. 20	Aug. 31
Sept. 27		
	Oct. 11	Oct. 18

Comparison with the table of ploiman pulses at Station I shows that four of the *B. caudatus* pulses correspond exactly while two others are very close. It is thus evident that the relationship of occurrence of this organism to that of the chlorophyll bearers is about as intimate as that of the whole ploiman group.

The larger numbers at Station I indicate favorable influence of sewage and the distinct limitation to temperatures above 20° C. and mark *B. caudatus* as a summer form. The maxima in late summer may also indicate stagnation as a favorable factor. Kofoid's reference (1908) to the contention of various observers that spinous processes, etc., appear as adaptive responses to lessened buoyancy of warmer waters is especially interesting in this connection. The condition of our records more strongly supports that view than do the Illinois records. In fact the evidence could hardly be stronger without deliberate manipulation.

Brachionus budapestinensis D.

	Station I	Station II	Station III	Daily	Hourly
Average	970	7,564	2,322	413	9,615

Identification doubtful. Recorded six times at Station I, thirteen times at Station II and seven times at Station III. Occurrence at all stations rather scattered and mainly from July to October. Maximum at Station II in August. Apparently hindered by sewage but favored by warmth and stagnation. Not a very important form here, though the average at Station I is somewhat higher than it was in Illinois.

Brachionus calyciflorus Pallas. . (*B. pala* Ehrbg.)

	Station I	Station II	Station III	Daily	Hourly
Average	109,718	10,828	32,378	516	175,708

Identification satisfactory. No attempt to distinguish varieties in final records. The above count consists entirely of females exclusive of eggs. The most striking features in the record of the occurrence of this form are its great abundance in the first four or five months of the year at all stations, its abrupt disappearance at the close of this period and its reappearance in considerable numbers in and after August. The three stations vary considerably in these last two points, the break in the record in May being much more abrupt at Station I than at either of the others. Station I also shows only a few very light catches in the fall while Station III reaches the maximum for the year at that time. Station II has the maximum in February but shows records of considerable numbers through September and October. Station I has the maximum in March. The reasonable inference seems to be that much sewage is favorable to this species in flood water but that it is detrimental in stagnation. Also that temperatures above 20° C. are rather unfavorable.

The numbers here were much larger than those noted in Illinois and the vernal maxima came about a month earlier. Otherwise there is rather close similarity in the records. Recurrent pulses are not distinct, however, at any of our stations here.

Brachionus capsuliflorus Pallas. (*B. bakeri* Ehrbg.)

	Station I	Station II	Station III	Daily	Hourly
Average	1,954	14,418	9,582	1,445	40,468

Identification probable. Occurrence at Station I scattered, in small numbers, from May to December, with a small maximum in October. Occurrence at Station II almost limited to August and September, with a maximum in September. At Station III somewhat similar, except for a slightly larger number of earlier records of small numbers.

The likeness to Illinois conditions is very marked, especially at Station II. Our records indicate that sewage is detrimental while stagnation and rather high temperature (near 24° C.) are beneficial. It seems rather strange that though the river showed the largest numbers, the limits of their occurrence were much more sharply defined than at the other stations; only four small catches being found outside of the eleven weeks period from August 2 to October 11, as against twice that number elsewhere. No males were recognized.

Brachionus patulus Müll. (*B. militaris* Ehrbg.)

	Station I	Station II	Station III	Daily	Hourly
Average	120	4,804	1,631	310	10,469

Identification certain. Recorded only once at Station I in July (6,400). Occurrence at Stations II and III limited to July and August and September, except for one catch on December 6 at Station II. Maximum on September 6 at both places. Evidently a summer form favored by stagnation but intolerant of sewage. No data are at hand bearing upon Kofoid's suggestion (1908) that this species probably thrives in warm, shallow water rich in organic matter. Its absence from sewage does not prove that it would be injured by decaying vegetation, etc.

Brachionus plicatilis Müll. (*B. mülleri* Ehrbg.)

	Station I	Station II	Station III	Daily	Hourly
Average	9,179	977	965	413	....

Identification usually satisfactory. Occurrence at Station I mainly in first three months, thereafter in small numbers at variable but usually wide intervals through the year. Maximum (132,240) twice, February 12 and March 5. Numbers always small at other stations, otherwise distributed about the same. Hence this form may be said to be definitely limited to temperatures below 20° C. Sewage appears to be favorable.

This species is not listed by Kofoid for Illinois. Mr. H. K. Harring designates it particularly as a brackish water form. It is also so listed in *Süsswasserfauna Deutschlands.* However, its presence here is not so prominent as is that of the brackish water diatom, *Bacillaria paradoxa.* Some other factor than salinity must determine the occurrence of such forms.

Brachionus urceus L.

	Station I	Station II	Station III	Daily	Hourly
Average	139,352	8,558	2,871	352,237	36,606

Identification usually satisfactory. Some confusion with other forms at times. Recorded in every month of the year at Station I. Missing in March and November at Station II, in April, November and December at Station III. There was a well developed pulse in February at Station I but there were only four catches from March I to May 14 when a long period of regular appearance in considerable numbers began, which finally ended on October 29. Numbers were then small and absences frequent to the end of the year. Maximum (899,232) reached twice in June. Records scattering at Station II except in June, July and August. Maximum (105,792) on August 2. Conditions similar at Station III with smaller numbers. Maximum September 20, 38,400. This form shows a clear preference for sewage and for temperatures above 20° C., but stagnation is apparently detrimental. Recurrent pulses are fairly distinct at Station I as follows:

Feb. 8	July 26	Sept. 27
June 3	Aug. 9	Oct. 15
June 21	Aug. 23	Oct. 29
July 12	Sept. 9	Nov. 15

Of the twelve dates just mentioned, eleven can be connected definitely with pulses of chlorophyll bearers, four preceding by from four to eleven days, four following by three or four days and three exactly coinciding.

Brachionus with endoparasites. Average at Station I, 5,363.

Different species of *Brachionus* were found infested with parasites but no specific count was made. These parasites were rather small and their relationships were not determined. In almost all cases they occupied at least half of the space inside the lorica of the host. None were noticed at Stations II and III so it is probable that sewage is favorable to the parasites in some way. They were recorded five times at Station I, one in June, thrice in August and once in November.

Diurella egg, free.

	Station I	Station II	Station III	Daily	Hourly
Average	4,161	146,079	108,270	4,445	122,068

Identification very doubtful. Small eggs attached to filaments of *Melosira granulata* were counted under this heading. They were only recorded eight times at Station I but they were quite prominent at the other stations, at Station II from June to October inclusive, at Station III from May to October inclusive. Inasmuch as no considerable number of *Diurella* females were ever found, it is probable that these eggs were wrongly designated, but nothing is known as to the real identity.

Epiphanes clavulata Ehrbg. (Notommata.)

	Station I	Station II	Station III	Daily	Hourly
Average	1,263	6,400	10,423	....	....

Identification uncertain. Recorded five times at Station I, nine times at Station II and seven times at Station III in August, September and October. Hence it is to be regarded as definitely limited to stagnating waters and temperatures above 20° C. Sewage unfavorable. Attached female eggs were also recorded for this form at Stations II and III.

Filinia brachiata Rous. (Triarthra.)

	Station I	Station II	Station III	Daily	Hourly
Average	2,943	123	62	206	....

Identification certain. Recorded eleven times at Station I and once at each of the other stations. Occurrence at Station I usually in small numbers at rather wide intervals. Catches grouped in May and November. Maximum in November. This species was not reported as present in Illinois.

Filinia eggs, attached.

	Station I	Station II	Station III	Daily	Hourly
Female, average	79,131	554	1,004	12,667	....
Male, average	24,818	431	251	....	....

Identification certain. Attached female egg appeared in every catch at Station I from February 12 to April 26, then frequently to

July 19, being absent the rest of the year except for two small catches in November. Maximum (1,481,088) in March. Recorded only five times at other stations, mainly in March.

Male eggs were recorded continuously at Station I for a short time in February and March and there were occasional catches to June 28. They were recorded once at Station II and twice at Station III in small numbers. Both kinds were first recorded at Station I on February 2.

The maximum egg records of both kinds at Station I preceded the maximum record for females of *Filinia longiseta* by three days and the maximum for female eggs was almost reached again four days after it.

Unattached *Filinia* eggs were not certainly identified though recorded.

Filinia longiseta Ehrbg.

	Station I	Station II	Station III	Daily	Hourly
Average	361,166	14,486	12,192	99,012	4,561

Identification positive. About twice as abundant at Stations II and III as ever noted by Kofoid in Illinois and about fifty times as many at Station I. Seasonal limitation earlier and more definite here at all stations. Occurrence at Station I regular from January 5 to July 19, missing thereafter except for two small catches in December. Maximum on March 8, 6,083,040. Catches of more than 1,000,000 taken seven times in February and March, three in May and one each in June and July. An extremely important planktont at this station. At Station II one small catch was made in January but the regular occurrence began February 23, extending to April 13. Several more catches to July 12, then none till late October, followed by another in December. Maximum on March 8. At Station III one small catch came in January, then the regular occurrence began on February 8, extending with one lapse to July 12. Only two catches thereafter, one in July and one in October. Maximum on June 28.

There were rather distinct recurrent pulses at Station I culminating as follows:

Jan. 15	Feb. 23	May 7
Jan. 29.	Mar. 8	June 3
Feb. 12	Apr. 13	July 5
	Apr. 26	

Contrary to Illinois conditions the principal occurrence of this form was below a temperature of 20° C. instead of above, and from March to July instead of from May to October, so far as Station I is concerned. In view of the enormous numbers at Station I it may be safe to conclude that the food factor is more potent than temperature and that the smaller Illinois numbers at lower temperatures were only indirectly due to that condition. With abundant food in the sewage the lower temperatures seem quite favorable here. This form may then be regarded as very dependent upon sewage. The higher temperatures and stagnating waters seem to be deterrent.

Keratella cochlearis Gosse. (Anuraea.)

	Station I	Station II	Station III	Daily	Hourly
Average	78,769	281,504	354,304	164,517	6,530

Identification usually certain. No attempt to distinguish varieties. Some confusion probably of spineless varieties with spineless varieties of *K. quadrata* or other species. The numbers were greater at all stations than recorded for Illinois, but the records resemble Illinois records in the fact that the organism was found at some station in every month of the year. Also in the fact that there was a period of regular occurrence in the first seven months of the year, separated by a period of irregular occurrence or absence from a period of regular occurrence in the last three months. The location of the maximum is distinctly different from the Illinois condition at all stations. The maximum there was early in May, while our records show a maximum at Station I in July and at Stations II and III on November 1, the last two being in remarkably large numbers. The inference from our records is that sewage is detrimental in large amounts, that stagnation is even more so, and that temperature in moderate limits is less important directly than are other factors. The optimum temperature seems to be slightly below 20° C. The presence of largest numbers at Station III indicates the probability that a larger amount of organic matter than that in the river may be favorable.

Recurrent pulses are distinguishable at all stations, about half of those at Station I corresponding closely with those of chlorophyll bearers.

Station I		Station II	Station III
Feb. 12	June 18	Mar. 23	Mar. 23
Mar. 5	June 28	Apr. 19	Apr. 19
Mar. 19	July 5	July 12	May 31
Apr. 2	Oct. 26	Nov. 1	July 12
Apr. 23	Nov. 12		Nov. 1
May 7			

This was numerically the most important planktont at Stations II and III.

Keratella quadrata Müll. *(Anuraea aculeata.)*

	Station I	Station II	Station III	Daily	Hourly
Average	1,276,350	42,919	57,432	1,467,437	219,396

Identification usually certain. Contrary to Illinois records this was numerically our most important rotifer, all stations considered. It was one of the most important planktonts. Furthermore our records show it to be a distinctly perennial planktont here, since considerable numbers were found at all stations in every month of the year. At Station I there was only one lapse in the record. The increase was unusually uniform from January 5 to the maximum on June 28, followed by a similar decrease to December 31. At Station II the occurrence resembled that of *K. cochlearlis* in that there was a decrease in numbers with a few absences in the summer months, thus making the records for spring and autumn more prominent. The maximum came on October 18 not far from the *K. cochlearis* maximum. At Station III the records for the summer were not materially different from those for spring and fall except that the maximum came on October 11 in a much larger pulse than at other times.

Not only do our records fail to correspond with those of Illinois, they also fail to agree at our three stations. Consider, for example, the maximum in relation to temperature. Station I shows a maximum in a strongly developed pulse at a temperature of 23° C., Stations II and III at 17° C. Station I has its largest numbers in summer, Station II its smallest and Station III much the same as in other seasons. In spite of these differences some definite conclusions are possible. The vastly larger numbers at Station I at all seasons indicate not only a beneficial effect of sewage but the importance of the food factor. The smaller numbers at all stations in January and December show that temperatures may get low enough to be injurious, though it is not clear that this may not be due to reduced food supply incident to low temperature. In fact, when one considers that the numbers appearing at Station I at 7° C. or 9° C. were as large as those found in the culminations of ordinary pulses at the other stations in any season, it seems that the range of temperatures in ordinary fresh waters has little direct bearing on production. The unusually strong pulses in October at Stations II and III indicate a beneficial effect due to relief from Stagnation by the incoming autumnal freshet waters from the mountains.

Recurrent pulses are quite prominent in the records for this form, with culminations as follows:

Station I		Station II	Station III
Jan. 15	June 28	Feb. 8	Feb. 8
Jan. 29	July 12	Mar. 29	Mar. 23
Feb. 12	July 26	Apr. 19	Apr. 5
Feb. 23	Aug. 23	May 31	May 17
Mar. 8	Sept. 13	July 19	June 28
Apr. 5	Oct. 8	Aug. 31	July 26
Apr. 19	Dec. 3	Oct. 18	Oct. 11
May 11	Dec. 14	Nov. 30	Dec. 14
June 3	Dec. 31		

Keratella eggs, attached.

	Station I	Station II	Station III	Daily	Hourly
Average	263,312	54,732	96,442	140,815	12,669

Identification certain. No male eggs were recorded and no effort was made to keep the species record separate for eggs. The desirability of such separation was overlooked until too late; hence, as might be expected, the egg record shows the same characteristics as the dominant species, i.e., *K. quadrata* at Station I, and *K. cochlearis* at the other two stations.

Keratella egg, free.

	Station I	Station II	Station III	Daily	Hourly
Average	363,933	57,631	100,216	128,490	602,201

Identification quite uncertain. The designation was probably correct in a large majority of the counts but there is enough uncertainty to invalidate definite conclusions, so they are not offered.

Lecane luna Müll. (*Cathypna.*)

	Station I	Station II	Station III	Daily	Hourly
Average	10	677	251	....	....

Identification uncertain. Recorded only four times at Stations I and II in small numbers, and once at Station III. Probably adventitious. At any rate unimportant.

Notholca striata Müll.

	Station I	Station II	Station III	Daily	Hourly
Average	165	1,692	847	....	....

Identification satisfactory. Count included a small number of different forms most of which were considered varieties with perhaps one or two other species. Only six catches at Station I at rather wide intervals, in very small numbers and mostly in the first three months. Occurrence at Station II in every month except December, seven catches in first three months, one catch in each month thereafter up to December. Numbers always small. Maximum, 16,000, April 5. Recorded nine times at Station III, seven times from January 23 to April 19 and twice in November. Numbers always small but considerably larger in November than at other times. It is clear from these records that this form is intolerant of sewage and of summer conditions, probably including temperatures, though the monthly occurrence at Station II may indicate the influence of a food factor. At any rate the optimum temperature seems to be below 15° C. The seasonal distribution at our Station III most nearly resembles that noted for Illinois.

Polyarthra trigla Ehrbg. *(P. platyptera.)*

	Station I	Station II	Station III	Daily	Hourly
Average	410,770	35,241	58,037	662,712	1,267,469

Identification certain. Recorded in every month at all stations. Occurrence at Station I very constant after January 12, only two absences, both in November. Maximum on May 7, culminating a gradual increase from first appearance, numbers well sustained after that except for a drop in June, another in November and the final decline in December. Continuous record at Station II except for two misses in June, one in August, one in October and three in November. Maximum on September 6 in a well defined pulse. Record at Station III began on January 19, after which there was one miss in March, one in June, one in October and three in November. Maximum on September 20 in a minor pulse. The character of the record at Station I suggests the idea that temperatures may vary widely without appreciable influence except as they approach the lower recorded limits. Even here the influence may be through the food supply instead of direct. Stagnation appears to be slightly favorable. This is next to the most important species numerically, of rotifers at Station I.

Recurrent pulses are prominent at all stations as follows:

Station I		Station II	Station III
Jan. 15	July 30	Feb. 8	Feb. 8
Jan. 29	Aug. 9	March 8	Apr. 26
Feb. 8	Aug. 20	March 29	May 31
Feb. 23	Sept. 13	May 10	July 12
Mar. 8	Oct. 18	May 24	Aug. 2
Apr. 13	Nov. 1	June 28	Aug. 31
Apr. 26	Nov. 19	Sept. 6	Sept. 20
May 7	Nov. 30	Oct. 18	Oct. 18
June 3	Dec. 14	Dec. 14	Dec. 6
June 25	Dec. 31		
July 12			

These pulses at Station I are even more distinctly marked than in Illinois, which of course might be expected from the very large numbers distributed over the entire year. The correspondence of these pulses with those of chlorophyll bearers is quite close, thirteen being within seven days of the same date.

Polyarthra trigla eggs, attached.

	Station I	Station II	Station III	Daily	Hourly
Female, average	35,511	431	408	723	40,686
Male average	342	4,100			8,138

Identification certain. Probably most eggs became detached in manipulations and the records are to that extent unreliable. Certainly there are some very curious features to the records as they stand. Female eggs only were recorded at Station III in the regular series and then in small numbers at wide intervals, but the hourly series from the same canal, but a mile away, showed great numbers of both sexes. At Station II the numbers of female eggs were also scant but in the two catches of male eggs one was rather large. At Station I, female eggs appeared irregularly in small numbers from the last of February to the end of March, after which the occurrences were regular and in rather large numbers till May 11 when they abruptly failed. Only a very few catches were found in the interval to mid-November when the occurrence became regular again for several weeks. The records of male eggs came in November.

Such records are quite unsatisfactory as it is evident that they do not show the real numbers of eggs produced, in view of the large numbers of females recorded at all periods at all stations. Quite probably many of the free eggs counted as *Keratella* and *Filinia* eggs should have been referred to *Polyarthra*. This was suspected early in the count and the eggs were frequently examined for distinctive characters in the groups but none were found that could be used accurately while counting.

Rotifer eggs, winter, free, unidentified.

These were counted merely as a matter of routine in trying to give attention to everything found. There is not enough certainty in any observation concerning them to make comment desirable.

Synchaeta sp.

	Station I	Station II	Station III	Daily	Hourly
Average	76,696	35,039	83,865	19,850	25,890

Identification of genus satisfactory. Judging from living material, three or more species were represented in the counts but they could not be accurately distinguished in preserved material. *S. tremula*,, *S. stylata* and *S. pectinata* were probably most often present. Although the assemblage was recorded at Station I in every month of the year, the catches were few and small during the first three months and in July, August, September and October. The maximum occurred on June 25 in a strongly developed pulse. The occurrence at Station II was somewhat similar except that there were no large numbers till July when there was a fairly strong pulse. The maximum came, however, in the larger November pulse. At Station III the numbers were more evenly distributed from March to December, August being the only later month with very small numbers. The November pulse was largest on the whole but the maximum came on May 31 in a catch following a lapse and preceding two lapses. Such irregular records, in addition to the difficult identification make it necessary to be cautious as to conclusions. Still it seems clear that sewage is beneficial and that stagnation with high temperature is harmful.

Trichocerca capucina W. & C. *(Rattulus capucinus.)*

	Station I	Station II	Station III	Daily	Hourly
Average	246	4,777	1,004	413	9,123

Identification uncertain. Genus probably correct in all cases. Recorded only four times at Station I in small numbers and at wide intervals; seven times at Station II, once in fairly large numbers; eight times at Station III, all in small numbers. Unimportant numerically in our plankton. Probably adventitious.

Trichocerca iernis Gosse. *(Rattulus gracilis.)*

	Station I	Station II	Station III	Daily	Hourly
Average	13,097	21,577	46,414	88,913	285,187

Identification uncertain. May include other species. Not recorded at Station I till May 27 and not appearing regularly till July 3. Fairly constant through July and August and for a time in September, and October. Maximum in July. Occurrence at Station II almost limited to July, August and September with maximum in September. Conditions similar at Station III with a slightly longer period of regular occurrence. Maximum in September. Evidently favored by higher temperatures and quiet waters. Larger numbers at Station III than in river suggest that more organic matter in the water is helpful, though the organism does not do so well in the dilute sewage of Station I.

The following Ploima were only recorded once or twice, or were only recognized in living material.

Ascomorpha ecaudis Perty.
Asplanchna priodonta Gosse. Once, I.
Asplanchna sieboldii Leydig.
Asplanchnopus multiceps Schrank. Once, I and III.
Diaschiza exigua Gosse.
Diaschiza gibba Ehrbg.
Diurella porcellus Gosse. Once, II and III.
Diurella tenuior Gosse. Twice, I, and once, II and III.
Euchlanis dilatata Ehrbg. Once, III.
Filinia cornuta Weisse. Once, II.
Lecane ungulata Gosse. Once, III.
Lepadella ovalis Müll.
Macrochaetus subquadratus Perty. Once, III.
Monostyla cornuta Müll.
Monostyla lunaris Ehrbg.
Mytilina mucronata Müll.
Notholca longispina.
Notholca egg, attached. Once, III.
Notommata aurita Müll. Twice, I, once, III.
Platyias quadricornis Ehrbg.
Pleurotrocha petromyzon Ehrbg.
Rhinoglena frontalis. Once, II.
Trichocerca endoparasitized. Once, II.
Trichotria curta Voronkov. Twice, II, once, III.

Scirtopoda

Pedalia mira Hudson was found in very small numbers once or twice in fresh material from Stockton Channel but not in regular catches for 1913.

GASTROTRICHA

Chaetonotus nodicaudus Voight and another species were each recorded once at Station I. They are known to be present in the locality in larger numbers and are, no doubt, strictly adventitious.

ENTOMOSTRACA

	Station I	Station II	Station III	Daily	Hourly
Average	560,149	22,022	22,551	1,498,724	83,099

With the exception of three specimens of *Gammarus* found at Station III the Crustacea recorded consisted of Entomostraca. Of this group only the Cladocera and Copepoda were of any importance in our plankton. Entomostraca were recorded in every month of the year at all stations, but the numbers were small everywhere during the first three months and there were some misses at all stations at that period. In addition, Stations II and III showed occasional absences up to May and June, and in the last two months of the year. The greatest abundance at all stations was in July, August and September with the maximum in August or September at all.

The count of Entomostraca is unsatisfactory for two reasons: first, specific identifications were too difficult for the writer under the conditions of work; second, the method of counting permitted too much error. Special trials showed that even distribution of Entomostraca in the counting cell seldom occurs. As the records stand, the main error was due in most cases to counting only the same fractional field as was counted for smaller organisms. It was the intention to make a special count of Entomostraca later in order to correct this, but an examination of the records showed that it was not probable that the limited increase in accuracy of count would make any material change in the possible conclusions. For that reason the intention of recounting was abandoned. So far as can be estimated from several recounts made at random, the variance in the count by the two different methods is mainly from 10 to 25 per cent.

Cladocera

	Station I	Station II	Station III	Daily	Hourly
Forms recorded	3	4	4	2	2
Individuals per cu. meter	3,836	7,385	9,197	7,432	34,752

The Cladocera were rarely prominent at any station. There was probably a much larger number of forms present than was recorded, since names were given only to those with conspicuous characters. The averages were distinctly lower at all stations than they were found to be in Illinois, except for one year there of recurrent floods. Since 1913 seems to have been an unusually stable year here, there is reason for believing that the Cladocera are naturally fewer here. They were recorded in every month of the year at some station but the catches were few and far between and the numbers small at all stations until August. The maximum came on October I at Station I and in September at Station II and III, after which the numbers rapidly declined at all stations. Our records therefore agree with those of Illinois in showing the favorable effect of stable (or even stagnating) water and of high temperatures. We have the further indication that sewage is detrimental since Station I had so much fewer numbers than either of the other stations. The explanation of the deleterious effect of flood waters in Illinois (Kofoid 1908) applies equally well here. The evidence for recurrent pulses is not convincing here at any station.

Discussion of Genera

Bosmina longirostris O. F. Müll.

	Station I	Station II	Station III	Daily	Hourly
Average	746	5,000	5,145	1,652	13,684

Identification probable. This form was rare at Station I, being recorded only eleven times in small numbers, six times in September and October, the rest scattering. Catches at the other stations were almost confined to the same period but there were more of them and the numbers were larger. Clearly favored by warm, stagnating water and retarded by sewage.

Chydorus sp.

	Station I	Station II	Station III	Daily	Hourly
Average	....	1,662	1,555	....	....

Identification doubtful. Recorded seven times at Station II mainly in August and September, and five times at Station III at irregular intervals. No definite conclusion possible, though the indication is that sewage is injurious, while warm stagnating water is favorable.

Sida sp.

	Station I	Station II	Station III	Daily	Hourly
Average	2,960	738	1,325	5,781	21,068

Identification doubtful. There was probably considerable confusion with other forms, especially *Daphnia*. Recorded frequently at Station I from early June to late October, rarely at other times. Numbers always small except on October 1 (105,792). Recorded twice at Station II and seven times at Station III, nearly all in the warm months. Seems to be a warm water form favored by sewage and quiet waters.

The following other genera of Cladocera were thought to be present:

Alona sp.
Bosmina sp. All three stations.
Daphnia sp.

Ostracoda

Ostracoda were mainly notable for their absence. *Cypris* sp. was the only form recognized and it was rare. It was not recorded from the preserved material. Inasmuch as it has been found in abundance in ditches and temporary ponds about Stockton, it must be regarded as strictly adventitious.

Copepoda

	Station I	Station II	Station III	Daily	Hourly
Forms recorded	4	3	3	4	3
Individuals per cu. meter	556,312	14,882	14,549	1,488,421	189,469

Copepoda were recorded in every month of the year at Station I, and they were entirely missing only at Stations II and III in December and November, respectively. Numbers were small at all stations through the first three months and in the last month. At Stations II and III they only reached 100,000 in three catches in September at the former, and one catch at the latter. There was no increase in numbers at either place until May and the decline was very rapid after September. On the contrary, Station I showed very marked and steady increase in numbers after March and the decline after September was gradual, though starting abruptly with the close of the month. The maximum at Station I came in August according to the record but it was so nearly eqalled in September that a recount might show it really to be in that month. However, this does not affect the general conclusion that the warmest months are most favorable, the culmination coming with approaching stagnation. The record also clearly shows that the dilute sewage of Station I was distinctly favorable to this group.

Specific identifications were not attempted and there was certainly some confusion of forms during the count. Some of these errors could be corrected by a recount, but in the writer's judgment there would not be enough advantage to warrant the great effort involved.

Dr. C. D. Marsh, of the United States Bureau of Plant Industry, very kindly identified a few forms from a very limited amount of material sent to him. He noted the presence of *Cyclops americanus* Marsh, *Cyclops prasinus* Fischer, and *Cyclops albidus* Jurine. No other Copepoda were found in the samples sent to him but the writer is certain that some other forms occurred at times in limited numbers. Since Cyclops completely dominated the other genera in numbers, discussion of seasonal distribution will be deferred till discussion of that group is reached.

Discussion of Genera

Canthocamptus sp.

Identification fairly certain. Recorded only twice at Station I, thrice at Station II and five times at Station III in small numbers and at wide intervals, but mainly in spring and fall. This genus has been found in abundance in some of the shallow temporary ponds in Stockton in February, March and April, hence it is to be regarded as adventitious in the plankton collections.

Cyclops sp.

	Station I	Station II	Station III	Daily	Hourly
Average	165,660	2,238	7,929	525,978	83,099

Identification of genus usually certain. May include some other genera when preservation of the individual was poor. As mentioned above, Dr. Marsh has indicated the presence of three species in the first half year. These were *C. americanus* Marsh, *C. prasinus* Fischer, and *C. albidus* Jurine. It is probable that there were few other species and that these furnished the principal numbers.

The genus was rarely missing at Station I, though the numbers were comparatively small before May and in December. Only two catches were recorded before June 21 at Station II and two after September 13. Conditions were somewhat the same at Station III, though the number of catches before mid-June was larger. The evidence seems to be conclusive that the genus is favored by sewage, by stagnation and by high temperature. It does not seem possible that recounting by any method could change the basis for such conclusions.

There is some evidence of recurrent pulses at Station I but a recount would be necessary before listing them with full confidence. As it stands, no very close relationship to the algal pulses can be shown except in two or three cases.

Diaptomus sp.

While this genus does not appear in the record, it is so certain that it was present that definite mention of the fact seems desirable. It may have been sometimes included in the count with Cyclops, but the numbers were never very large and it may have failed to get into the counting field except in one or two cases.

Nauplius spp.

	Station I	Station II	Station III	Daily	Hourly
Average	392,240	11,722	5,239	962,366	106,370

All kinds of larval copepods were included under this heading. Undoubtedly, nearly all belonged to *Cyclops*. They showed practically the same characteristics of distribution at all stations as those already noted for *Cyclops*, almost the only difference being that more catches were recorded. This might be expected since such a variety of larval forms was included in the count.

No copepods other than the forms already noted were recorded from the 1913 collections. Since most of the Entomostraca were quite well preserved, it may be possible to make a critical study of the group at a later period.

MALACOSTRACA

Three specimens, probably *Gammarus* sp., were found at Station III in January, 1913. They were taken from very shallow water before the best place for collecting was found and they were evidently adventitious in the plankton.

MISCELLANEOUS

Glochidia spp.

	Station I	Station II	Station III	Daily	Hourly
Average	256	6,415	471	723	....

General identification certain. May include larvae of several species of fresh water clams. Recorded three times at Station I in July and August and five times at Station III, mostly in the same period. At Station II the numbers were much larger and the catches more numerous. Recorded three times in January and February in very small numbers and almost continuously in June and July. Sewage evidently detrimental and flood water favorable to occurrence in the plankton. Effect of temperature uncertain.

Macrobiotus sp.

	Station I	Station II	Station III	Daily	Hourly
Average	80	854	2,263	....	....

Identification satisfactory. All the Tardigrada found were referred to this genus. It was only recorded twice at Station I, eleven times at Station II and three times at Station III, always in small numbers. Evidently adventitious.

Nematoda sp.

	Station I	Station II	Station III	Daily	Hourly
Average	212	185	424	....	....

Identification of the order certain. Nothing definite known as to generic classification. Very many specimens were immature. Recorded six times at Station I in small numbers and at wide intervals, twice at Station II, and five times at Station III, these five being taken in the first three months. These are evidently adventitious forms in the plankton.

Other groups represented by only one or two forms or seen only in fresh material are as follows:

Chironomus larva. Twice, II.
Oligochaetes. Three times, II.
Nais (?) sp.
Oelosoma sp.
Planarian.
Statoblast of Pectinatella. (?)
Statoblast of Plumatella. (?)
Hydrachnida sp. Twice, II.

Summarizing, it may be worth while to call particular attention to the number of forms present at different stations in different months, and to the proportional differences in numbers of organisms at the three stations by months, as shown by the accompanying text table.

TEXT TABLE 6.—NUMBERS OF KINDS OF PLANKTONTS BY STATIONS AND BY MONTHS IN 1913

	January			February			March			April		
Stations	I	II	III	I	II	III	I	II	III	I	II	III
Bacteriaceae	1	0	0	1	0	1	1	0	0	0	0	0
Schizophyceae	7	4	3	7	4	3	6	6	6	7	7	8
Chlorophyceae	7	6	3	9	6	6	8	8	8	13	9	8
Bacillariaceae	24	28	18	22	28	28	26	34	38	27	37	33
Conjugatae	6	3	3	4	4	5	1	6	4	2	6	6
Mastigophora	6	5	5	10	6	11	8	7	7	7	6	9
Rhizopoda	2	1	2	3	2	3	3	2	4	5	5	4
Heliozoa	0	0	0	0	0	0	1	3	1	1	0	1
Ciliata	13	2	3	17	5	9	18	7	10	16	8	8
Suctoria	0	0	0	0	0	0	0	0	0	0	1	0
Rhizota	0	1	0	0	0	0	0	0	0	0	0	0
Bdelloida	3	3	2	3	2	2	3	3	2	2	2	1
Ploima	11	10	9	10	12	10	15	11	12	14	12	10
Cladocera	1	1	1	0	0	0	0	0	1	0	2	1
Copepoda	1	1	1	1	1	2	2	1	1	3	2	1
Miscellaneous	1	4	1	2	3	2	0	3	2	1	1	1
Total	83	69	51	89	73	82	92	91	96	98	90	91

	May			June			July			August		
Stations	I	II	III	I	II	III	I	II	III	I	II	III
Bacteriaceae	1	1	0	1	1	1	1	0	1	1	1	1
Schizophyceae	9	5	6	10	7	10	8	10	11	12	14	14
Chlorophyceae	10	8	8	11	8	7	11	9	10	10	10	9
Bacillariaceae	25	37	31	23	42	34	18	35	29	22	35	33
Conjugatae	1	4	2	4	4	5	5	5	5	5	6	6
Mastigophora	10	7	9	9	9	11	10	12	14	15	13	10
Rhizopoda	6	2	2	4	3	3	5	3	4	6	5	7
Heliozoa	1	0	2	1	1	2	3	4	3	4	4	3
Ciliata	8	4	5	3	3	3	7	2	2	8	5	5
Suctoria	0	0	0	0	0	0	0	1	1	0	2	2
Rhizota	0	0	0	0	0	0	0	0	0	1	2	1
Bdelloida	2	2	2	2	2	1	3	3	1	3	3	2
Ploima	16	9	15	16	15	13	16	20	16	15	16	16
Cladocera	1	1	1	1	0	1	2	1	2	2	3	3
Copepoda	2	1	1	1	1	1	1	1	1	2	2	2
Miscellaneous	1	5	0	1	2	0	1	1	1	1	1	2
Total	93	86	84	87	98	92	91	107	101	107	122	116

TEXT TABLE 6.—NUMBERS OF KINDS OF PLANKTONTS BY STATIONS AND BY MONTHS IN 1913—*Continued*

	September			October			November			December		
Stations	I	II	III	I	II	III	I	II	III	I	II	III
Bacteriaceae	1	0	1	1	1	0	1	1	1	1	0	1
Schizophyceae	12	12	11	11	10	6	9	12	11	12	5	3
Chlorophyceae	11	10	11	11	11	11	10	11	10	11	6	7
Bacillariaceae	25	28	25	28	25	31	26	29	35	32	29	36
Conjugatae	5	6	5	5	5	4	3	4	3	4	5	4
Mastigophora	15	12	16	13	9	10	14	10	12	13	8	9
Rhizopoda	6	7	6	6	4	5	7	5	6	5	4	3
Heliozoa	3	3	4	5	3	5	3	2	2	1	0	1
Ciliata	5	3	6	12	6	5	15	8	11	20	6	10
Suctoria	1	1	1	1	2	1	2	2	0	3	3	1
Rhizota	1	1	1	1	1	2	0	1	1	0	0	0
Bdelloida	3	3	2	3	3	2	3	3	2	3	3	2
Ploima	13	17	16	16	15	16	11	11	11	8	12	4
Cladocera	2	3	1	2	2	1	2	1	2	1	2	1
Copepoda	1	1	2	1	2	1	1	1	0	1	0	1
Miscellaneous	0	1	0	0	1	1	1	0	0	0	2	1
Total	104	108	108	116	100	101	108	101	107	115	85	83

This table shows some points quite well. The number of forms was lowest at all stations in January. There was then steady increase to May, when flood waters were highest and the number of forms recorded slightly less. Increase in number of forms began again in June, becoming greatest at Stations II and III in August and at Station I in October. The numbers were well sustained at the two stations until December, when there was a marked decrease. Station I not only showed increase to October, but almost equaled it in December. While it is probable that more accurate species determination might change the detail of this showing, it is not probable that the general differences would be affected.

One legitimate inference from this table is that Station I is less subject to seasonal fluctuations than either of the other stations. At present the only reasonable explanation of this fact seems to be that the dilute sewage of Station I is the prime factor, for the superficial resemblances would lead one to expect that Stations I and III would most closely approach each other in character and distribution of populations, rather than Stations II and III. But the reverse is true, and sewage is the only known factor of sufficient moment to account for it. It is true that temperatures run slightly higher at Station I, but is it not possible that this higher temperature is partly due to the rapid turnover of the great quantities of organic matter.

Aside from the question of temperature there is ample reason for assigning main influence to sewage because of the great food supply, a supply superabundant and hence essentially constant through the year, with the exception of May and June, the time of the mountain floods. The decrease in number of forms at this time strengthens the view that flood waters dilute the sewage and reduce the food supply, thus reducing reproductive and growth activities. There is also considerable loss through washing out, even with the rather low waters of 1913. The 1914 collections should certainly throw some additional light on this question.

THE DAILY SERIES

As noted elsewhere, the daily series was undertaken in the hope that it would give definite information concerning the problems of recurrent pulses and the incident conditions. This hope was partly realized, although the thirty-one days constituting the series was not enough, and it is evident that more faithful adherence to a uniform hour of collection is desirable. Since this last would involve very marked differences in condition of tide, it is probable that Stockton is not a good locality for such a test. It would be much better to try it in a locality free from tidal influence. It is also probable that the large amount of traffic past the point at which this series was taken might affect the results. At any rate, these two factors, at least, might be eliminated in some other locality. However unimportant they might later be proven to be, they do make the problem needlessly complex.

Under the circumstances it does not seem desirable to discuss individually even the more conspicuous species. Generalizations to be reached by such discussion in this series do not differ materially from those to be obtained from consideration of the larger groups. Species records are given in table 4.

Although the thirty-one days did not give a series of sufficient length to be wholly satisfactory, there are some points of decided interest. These are graphically indicated in plates 1, 6, and 3. In plate 1, showing volumes, there was a prominent pulse apex on July 13, another maximum for the series on July 18, and another almost as large on July 27. Explanation of this is afforded in part by plate 6, where it is shown that chlorophyll bearers and Protozoa and Rotifera all had pulse culminations near July 13 and July 27, while the Entomostraca showed a pulse culmination maximum for the series on July 22. It is evident that the median position of the volumetric maximum is due to its dependence on the entomostracan numerical maximum since the bodies of individual Entomostraca are so much larger than those of the other planktonts. Just why the numerical maximum of Entomostraca should fall between pulses of other groups does not so clearly appear. The most obvious explanation is that the abundant food supply furnished by other organisms near July 12 led to abundant reproduction of Entomostraca (mainly *Cyclops*), which in turn reduced the number of other organisms and led to its own decline. The pulse culmination of other organisms at July 27 would then be due to rapid recovery from the inroads of the Entomostraca.

On account of insufficiency of records, consideration of light relations does not give very satisfying aid toward an explanation of these pulses. Both our records and those of Mr. Higby, the Stockton weather observer, were made at a particular time of day and so fail to show the day as a whole so far as clouds, etc., were concerned. It is also true that such records fail to show the influence of the wind except for a small part of the day. As the records stand (table 7), the daylight conditions appear to have been too nearly uniform through the series to have had any marked influence on plankton pulses.

Reference to the lunar cycle for July, 1913, however, suggests the probability of its having a strong influence in this connection. It may be noted that the beginning of the marked rise in production of chlorophyll bearers came on July 10 at the first quarter of the moon, and that the apex of the pulse for these organisms came on July 17, at full moon. The rapid decline thereafter may be easily explained by the unusual abundance of Entomostraca and other predatory animals, while the smaller pulse culminating on July 27 might be due to partial recovery from their attacks. The evidence here that the waxing moon brings rapid increase of chlorophyll bearing organisms is as strong as could possibly be imagined, since the record covers only a single lunar cycle. It makes one wish that the daily records might have been carried over several lunar cycles in order to find the variations which might be expected. This particular series certainly confirms in a definite way Professor Kofoid's argument (1908) that pulses of chlorophyll bearers, and consequently of other planktonts, tend to accompany increases of lunar light.

The important features in the records of this series are concerned most directly with the chlorophyll bearing organisms, as just discussed. But, as a matter of interest, brief mention will now be given of the typical Protozoa (Mastigophora are included above with chlorophyll bearers) and of the Rotifera. Examination of plate 6 discloses the fact that Protozoa showed pulses at about the same periods as did the chlorophyll bearers, slightly preceding the latter at the first and coinciding at the second. The evidence which this gives of close association of the two groups is the only important feature. The analysis of the relationship presents some decided difficulties. In the first place, most of the Protozoa found here at this time were of the type which depends upon bacteria for food rather than upon green organisms (at least no Protozoa were ever observed with green organisms in their bodies). The presence of green organisms might favor them, however, by excretion of oxygen and absorption of carbon dioxide. Aside from these considerations, the only reason for coincidence of pulses in the two groups would seem to be in general conditions favorable to both.

In the case of the Rotifera, the abundance of food with which most of them are furnished by an increase in green organisms would seem sufficient to account for close correspondence of pulses of the two groups. Unfortunately for the validity of this view, the first rotiferan pulse (pl. 6) culminates on July 12, five days before the culmination of the pulse of chlorophyll bearers. It is also true that the second pulse coincides exactly with that of the green organisms. If the food relationship were the deciding factor, the rotiferan pulse should always follow. It is possible that here again is a case in which the gaseous content of the water forms one of the connecting links for two groups of organisms.

Summary

Considering the large numbers of factors which might influence the location of pulses of various organisms or groups of organisms, it is necessary for the present to say that the showing made by this daily series of a single lunar cycle may be to some degree accidental. Hence no inference can be regarded as proven. The important inferences suggested by these daily records may be summarized as follows:

1. There was a very distinct increase in numbers of green organisms as the light of the moon increased.

2. There was an abrupt decrease in green organisms as Entomostraca increased, which was followed by a partial recovery after the entomostracan maximum.

3. The two pulses of chlorophyll bearers were closely accompanied by similar pulses of Protozoa (exclusive of Mastigophora) and of Rotifera.

4. It is very necessary to have similar series covering several lunar cycles in order to evaluate the various factors of distribution and the bonds of relationship of plankton organisms.

Before leaving the discussion of this series, the point should be emphasized that daily collections frequently give a very different view of the situation from any that may be obtained at longer intervals. Comparison of plates 3 and 1 (graph Station I and Daily) shows this very clearly. Referring first to plate 1, it will be seen that although the regular Station I series was taken twice a week the difference is very great. In the Station I regular series the volumetric maximum came on July 30, but the daily record shows that four catches (July 13, 18, 20, and 27) exceeded it, two of them greatly. The semiweekly record shows this maximum on the rise of a pulse while the daily record shows it as on the decline of another. The daily record also shows marked fluctuations in volume of the catches during this lunar cycle which are not indicated by the other.

If the regular series had been taken only once a week (which is usually the shortest interval used by investigators), the dates would have been July 5, 12, 19, 26, and August 2. Comparing this with the daily record we see that it would have shown an erroneous picture of conditions since it would have indicated a considerable abrupt rise in volumes to fairly stable, higher levels.

Turning to plates 3 and 6, we find the same things true. In the case of the Entomostraca the remarkable pulse from July 20 to 23 is entirely missed by even the semiweekly method. While the pulses of the other groups are not entirely missed, they appear much more abrupt in the regular series than they really are.

In consequence of these remarkable differences it is surely clear that only the most general conclusions may be safely drawn from series of catches taken at intervals greater than one day.

THE HOURLY SERIES

This series, covering a period of about twelve hours on August 11, was undertaken in the hope of finding some indication of the importance of the daily tidal currents in a study of the plankton. It was also expected that some information might be obtained as to diurnal influences of light. The series is too short to be satisfactory (twenty-four hours would be better) and several days should be covered instead of one.

Despite these defects, the records indicate some points of interest. It happened that on the day selected low tide came at about 11 A.M. at Stockton, but there was no available way of recording the tide accurately. There is nothing in the record that can be positively connected with tides.

Still less than in the Daily series does there seem to be anything indicated by the species record which is not as well shown by major groups. For that reason the general discussion only will be given. Reference to table 5 will easily show such detail as has been recorded.

Since chlorophyll bearing organisms give, to a large extent, the basis of interpretation of plankton conditions they may receive first attention. Plate 6 (hourly) shows a preliminary drop in numbers from 7 A.M. to 8 A.M. a nearly uniform succession of catches to 12 M. and a constant rise through the remainder of the series to the close at 6:45 P.M. A graph of such very prominent characters demands explanation, but the demand cannot be fully satisfied from the present records. During the forenoon period of nearly uniform numbers the tide was ebbing, the air was hazy with full sunlight, there was little wind and the water was nearly smooth most of the time. In the afternoon period of rapidly and constantly rising numbers there was flowing tide, hazy air with full sunlight, strong wind, almost a gale at the close, and very rough water, with strong cross currents due to wind. The water temperature varied from 24° C at 7 A.M. to 26° C from 11 A.M. to 4 P.M. and to 25° C at 6:45 P.M. Among the observable factors involved, the temperature seemed to be the only one of sufficient constancy to account for the increase. Light was the only other factor that seemed likely to have had a beneficial effect and it was surely very much poorer in the afternoon on account of rough water. In view of such adverse conditions as rough water and poorer light it would have been reasonable to expect that there would at least be no increase in numbers of plankton in the afternoon. As the evidence stands it points distinctly to the conclusion that temperature was the dominant factor in the diurnal fluctuation of chlorophyll bearers.

If there had been only one or two larger catches in the afternoon or if there had been fluctuation in numbers there might be some question as to the sufficiency of the above evidence, but it will be noted that after 12 M. there was a steady increase broken by only one fall below the last preceding number and this break occurred at 6 P.M. A more detailed analysis of the chlorophyll bearing group very forcibly emphasizes the reliability of the record covering this point. In plate 11 it will be seen that Schizophyceae and Bacillariaceae have very pronounced increase after 12 o'clock, while Chlorophyceae and Conjugatae have moderate increase, somewhat wavering, and that Mastigophora have a strong but erratic rise from greater numbers at 1 P.M. a low minimum, to 7 P.M., almost equal to the forenoon maximum. It is also clear that all these except the Chlorophyceae show the sharp temporary decline at 6 P.M. Looking up species records in table 5, we find that the 6 P.M. decline is mainly due to deficiencies in numbers of *Nostoc* and *Cyclotella*. Also that the erratic record of Mastigophora through the day is due principally to *Chromulina*, *Hemidinium* and *Trachelomonas*, all very difficult to identify or to count. Taken as a whole, the evidence indicates that the records give a fairly dependable idea of the history of the chlorophyll bearers through the twelve-hour period. From this history the tentative conclusion may be drawn that temperature is a major if not the determining factor in daily fluctuations of numbers. It may be, however, that wind and waves do not exclude enough sunlight in shallow water to make any great difference and that the greatest influence in this case was due to sunlight. This last view is supported by the history of the other groups.

In case of the Protozoa, the Rhizopoda (pl. 11, and table 5) and the Heliozoa (table 5) give responses similar to chlorophyll bearers, i.e., an afternoon rise; but their numbers are relatively small, for most of the catches and their afternoon prominence might easily be due to the stirring of bottom waters by the strong currents caused by combined wind and tide. This leaves, then, the Ciliata as the only typical protozoan group with a reasonably clear record. Reference to table 5 shows the ciliate assemblage to consist almost entirely of *Holophrya*, *Tintinnidium* and two *Vorticella* and that they all agree in a strong forenoon representation with an afternoon decline, well pronounced for three of them. Since temperature would be expected to affect these as markedly as it did the chlorophyll bearers, while light probably would not, we have a valid conclusion indicated that light is the major factor in the afternoon rise in numbers of chlorophyll bearers.

The Rotifera (pl. 19) show substantial agreement with the Ciliata, both collectively and individually. Hence we are still further led to doubt the dominance of temperature.

As to Entomostraca (pl. 19) the catches of Cladocera were too variable to give any information, and those of Copepoda were also rather indefinite. There was not much difference between the forenoon and afternoon catches either of Cladocera or of Copepoda or of both together.

As shown by plate 1, the whole plankton volume increased strongly through most of the twelve hours, both actually and also relatively to the volume of sediment. No explanation of this fact seems to be available, although the distribution of the chlorophyll bearers may be of sufficient importance.

The foregoing discussion leaves a final impression which is badly muddled. This may truly represent the facts, but it is not satisfying to the mind. A different form of discussion may help to clear the problems involved. Examination of tables and plates already mentioned discloses the fact that, based on distribution through the twelve hours, there were two fairly well marked groups of planktonts, consisting on the one hand of the chlorophyll bearers and on the other hand of the more highly motile animal forms. The former showed a steady increase in numbers as the hours of afternoon passed. The latter showed just as pronounced a decrease, though less uniform, from the forenoon numbers.

Apparently the general factors which could probably be involved are the following: vital, chemical and physical. While specific subdivisions of these make a formidable list, which is further complicated by their very general interdependence, it seems that some are sufficiently dominant to enable tentative discussion, as in the accompanying list:

Vital Factors	Chemical Factors	Physical Factors
Locomotion	Organic content	Viscosity
Irritability	Mineral content	Turbidity
Feeding	Gaseous content	Suspended solids
Respiration		Currents {Tide, Wind}
Excretion		Oscillations
Reproduction		Temperature
Other organisms		Light
		Pressure

Locomotion, among the vital factors, is characteristic of the typical animal forms, but its effectiveness may be increased or diminished by respiration and excretion, or other factors, in the same animal or in neighboring organisms of any type. It may be similarly affected by the gaseous content of the water, which in turn is determined to some extent by temperature, light and currents in water and air, and so on with an indefinite number of combinations. It is necessary to limit our present discussion to those combinations which are most probably determinative within the twelve-hour period. Continuing the reference to locomotion with this limitation in view, we have to note that the more typically animal organisms may have been less numerous in afternoon catches because of migration to bottom layers of water, the lowest of which the net did not reach. Such a migration might be due to the influence of several other factors. Rising temperature might induce it directly by discomfort or indirectly by lessened viscosity of water, relatively increasing the influence of gravity, or by reducing the gaseous content, probably not greatly effective, or by changing the gaseous content through more oxygen excretion and carbon dioxide absorption by green organisms, or by increase of disagreeable excretions from the surface organisms as they became more active under higher temperature.

Locomotion might also be affected by the wind, directly by discomfort due to surface agitation, indirectly by interference with food taking near the surface through rapid oscillations of surface layers of water. Leeward drive of the wind is not considered because it would affect green organisms as much or more than the locomotor organisms.

Light might affect locomotion directly by discomfort and indirectly by the increase of starch manufacture, in green plants, with the larger amount of oxygen liberation and carbon dioxide consumption, thus shifting the region of the mean gas content to which motile forms are accustomed, to some distance below the surface.

Locomotion might affect non-motile surface organisms through removal of predatory organisms by migration, thus letting growth and multiplication go on unchecked. It would not be necessary for an organism to pass a whole life cycle in order to show this effect. Undoubtedly there are at any given moment in a plankton population many very young individuals, many just maturing, and many just ready to divide. Unfavorable conditions would arrest or deter developmental processes which would be again accelerated by favorable conditions. At a favorable time, then, many new organisms, which had been restrained during an adverse period, might be liberated and allowed to grow.

Reproduction as a factor influencing diurnal oscillations of numbers may not be important, but, for the reason just stated, it probably is. If, in addition to this, it could be shown that any considerable number of plankton forms accelerate both growth and fission processes with diurnal rise in temperature and that fission may occur two or more times in twenty-four hours, the argument in favor of dominance of temperature through the reproductive factor would be convincing. The writer has examined large numbers of publications without finding definite discussion of this point. Apparently the only cases in which the number of generations in a twenty-four hour period has been accurately determined have shown what occurred under special laboratory conditions only, and they do not tell what occurs with a mixed population under natural conditions. Even so, the published records of such studies deal almost entirely with animal types. Since the increase of numbers due simply to acceleration of vital processes is sufficient to account for any probable influence of the reproductive factor in this series, it is doubtless best to say that the addition of a distinct generation during the twelve-hour period is improbable.

It is also true that reproduction may be influenced by light. Some organisms may be stimulated to greater reproductive capacity, some to less. In the green organisms, with which we are now mainly concerned, it may be seen that light, through acceleration of food manufacture, might cause increase of fission, due to increased availability of energy producing and building materials. On the other hand, it seems to be pretty well known that in higher algae and phanerogams food manufacture is characteristic of day time, growth and reproduction of night, i.e., the plant does not carry on all its functions equally well at the same time.

The gaseous content of the water would be mainly effective, under ordinary conditions, through its influence on the irritability of the organisms and through its more or less direct connection with their feeding and respiration. A very slight difference in dissolved gases would surely change the responses of some organisms to light and other stimuli, but it is hard to determine the definite connection of that fact with the conditions now under consideration. As Birge and Juday have clearly shown, the physiology of plankton organisms cannot be fully determined by tests under artificial conditions such as those of the laboratory, e.g., the capacity of various animal forms for meeting anaerobic conditions of the environment is vastly greater in natural bodies of water than it is in artificial cultures. In the present instance it seems possible that the decline in numbers of certain zooplanktonts toward midday might be due to negative phototropism caused by supersaturation of water by oxygen liberated during photosynthesis by plants. But it might be due to negative phototropism due to rising temperature, or to negative phototropism or positive geotropism due to increasing agitation of the water, or to various other factors or combinations of factors.

So far as green organisms are concerned, it may be readily understood that photosynthetic and growth and reproductive processes might all be accelerated by the presence of carbon dioxide with a rising temperature and a considerable amount of sunlight (though less than the maximum because of rough water). It is also true that increase of oxygen formation might increase the buoyancy of the plant cells so that larger numbers of them would be in the region of water traversed by the net. This is especially probable in the presence of wind because any agitation of the shallow (two and one-half meters) water would be an aid to buoyancy.

There is no possibility of segregating tidal from other influences on our present information. So far as the currents, wind and tide, and oscillations of the water are concerned, taken all together, they might induce negative phototropism, or positive geotropism and thigmotropism in the animals. They might also affect the green organisms by aiding buoyancy and by increasing the circulation of the water, thus bringing more carbon dioxide to the absorbing surfaces and rapidly removing oxygen and other waste products from such surfaces.

Perhaps enough has already been said about temperature, but it will do no harm to recall that it affects flotation of organisms through changes in viscosity, that it probably plays an important part in reversal of tropisms under natural conditions, and that any change either accelerates or retards all of the activities of the organisms.

For this series the influence of light cannot be segregated from that of temperature since both are dependent on the sun's rays. It may be said, however, that light plays more or less part in reversal, or intensity of reversal, of tropisms of organisms, and that it is of major importance in photosynthesis and thus in effect on the gas content of the water.

So far as the other factors listed above are concerned, it is not seen that they could be of appreciable influence in this period under the conditions of variability recorded for the organisms and for the general factors involved.

One point of general interest may be noted in plate 1, where it appears from the volumetric graph that the total volume decreased gradually to midday and increased again through the afternoon, but that the net volume of plankton increased fairly steadily throughout the twelve hours. This is not what might be expected because the wind and tide of the afternoon should, theoretically, stir the water enough to increase the relative amount of silt. The unexpected silt diminution might be due to collecting conditions, the stronger combined current from wind and tide in the afternoon carrying away the silt stirred up by impact of the drain cup cylinder upon the bottom.

CONCLUSION

In conclusion it may be said that the following points appear distinctly from the present study:

1. San Joaquin waters are capable of supporting abundant plankton, and they do so in the vicinity of Stockton.

2. The plankton of the sewage-laden Stockton Channel is distinctly different from that of the river, the number and volume of its animal forms being especially conspicuous as distinguished from the algal dominants of the latter.

3. Temperature is, within certain limits, the determining factor in seasonal distribution. This may be by direct retardation of growth and reproduction in organisms, or by indirect influence through food supply and gaseous content of water.

4. Water currents above a very moderate speed are distinctly inimical to plankton development.

5. The peculiar succession of rainy season and dry season has resulted in an autumnal maximum of plankton about Stockton, a condition directly contrary to that of vernal maxima recorded by various observers in other localities.

6. Collections taken at intervals of one week or more do not furnish a basis for accurate determination of plankton distribution through the year. Daily collections properly taken would probably do so.

7. There is some evidence in favor of the idea that increase of lunar light tends to the increase of plankton, especially chlorophyll bearers.

8. There is evidence to show that fluctuations in amount of plankton occur at various hours of the day.

9. The abundant occurrence of *Bacillaria paradoxa*, generally listed as a typical brackish water form, is notable. This seems to be one case in which marked departure from a typical chemical environment has not visibly affected structure or behavior.

10. Lastly, it is necessary to emphasize the fact again that whatever fault or error there may be in this report is chargeable absolutely to the writer. In some cases expert advice has not been followed after being asked. On the other hand, there is the deepest obligation to the persons already mentioned for advice and assistance.

ADDENDUM

Since writing the discussion of the series of plankton collections of 1913 the statistics for the collections of 1914 and 1915 have been compiled and examined. Inasmuch as weekly collections only were taken in 1914 and 1915, and since two stations only were used in each of these years, the records are much less comprehensive than those for 1913. On this account, and also because the 1914 and 1915 records are essentially similar to those for 1913, it seems inadvisable to prepare them for publication. The collections for 1914 and 1915 have already been deposited with the Department of Zoology of the University of California and it is the writer's intention to deposit the manuscript records in the same place.

Transmitted August 15, 1918.

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913

1913	Spirillum undula	Anabaena sp.	Aphanocapsa sp.	Gloeocapsa conglomerata	Gloeocapsa sp.	Gomphosphaera aponinae
1/5						
1/8	400					
1/12						
1/15	400					
1/19	26,448					
1/22		800				
1/26					400	
1/29						
2/2					400	
2/5					2,400	
2/8					800	
2/12						
2/15	800					
2/19		800				
2/23						39,672
2/26						1,600
3/ 1	1,600					3,200
3/ 5						52,896
3/ 8						
3/12						
3/15					52,896	
3/19						
3/23						
3/26						
3/29					1,600	
4/ 2		1,600				
4/ 5					52,896	
4/ 9						6,400
4/13						3,200
4/16		1,600				
4/19		1,600				
4/23					52,896	
4/26					79,344	3,200
4/30						
5/ 3		79,344				3,200
5/ 7	1,600	9,600				1,600
5/11	1,600	52,896				1,600
5/14		105,792			105,792	3,200
5/17		6,400				
5/21		158,688				105,792
5/24		3,200			105,792	3,200
5/27	3,200				211,584	
5/31	105,792				3,200	3,200
6/ 3	3,200	6,400	1,269,504		105,792	
6/ 7		25,600	740.544		105,792	
6/11	3,200	6,400	846,336			
6/16	3,200	6,400	317,376		6,400	3,200
6/18	105,792	6,400	740,544		3,200	
6/21		370,272	687,648			
6/25	3,200	32,000	1,110,816			317,376
6/28	3,200	370,272	687,648			
7/ 3	3,200		687,648		1,600	
7/ 5	105,792		476,064		264,480	
7/ 9		158,688	687,648	38,400	370,272	
7/12		1,163,712	1,005,024	899,232	581,856	
7/16		846,336	1,216,608	158,688	1,375,296	
7/19		581,856	158,688	3,200	528,960	
7/23		105,792	6,400		264,480	
7/26		211,584	264,480		1,005,024	
7/30		158,688	211,584	3,200	317,376	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Spirillum undula	Anabaena sp.	Aphanocapsa sp.	Gloeocapsa conglomerata	Glococapsa sp.	Gomphosphaera aponinae
8/ 2	3,200	...	3,200	...	105,792	...
8/ 6	...	...	...	...	264,480	...
8/ 9	...	3,200	12,800	...	528,960	...
8/13	...	105,792	3,200	...	317,376	...
8/15	3,200	158,688	12,800	3,200	370,272	...
8/20	3,200	6,400	211,584	...	423,168	...
8/23	...	211,584	105,792	...	476,064	...
8/27	105,792	...	...	105,792	899,232	...
8/31	...	19,200	...	105,792	370,272	...
9/ 2	...	3,200	...	105,792	370,272	158,688
9/ 6	3,200	12,800	105,792	...	634,752	...
9/ 9	...	264,480	105,792	...	370,272	...
9/13	...	264,480	105,792	...	370,272	...
9/17	...	6,400	...	...	476,064	...
9/20	...	6,400	52,896	...	740,544	...
9/24	...	211,584	...	...	423,168	52,896
9/27	...	6,400	...	...	687,648	...
10/ 1	52,896	105,792	...	...	952,128	...
10/ 4	...	6,400	52,896	...	740,544	52,896
10/ 8	...	52,896	105,792	...	528,960	...
10/11	52,896	...	...	...	423,168	...
10/15	52,896	...	52,896	...	158,688	...
10/18	...	...	...	...	52,896	...
10/22	...	...	...	...	52,896	...
10/26	52,896	...	...	...	158,688	...
10/29	105,792	...	...	...	264,480	...
11/ 1	158,688	...	...	...	634,752	...
11/ 5	105,792	...	...	...	423,168	...
11/ 8	52,896	...	...	...	264,480	...
11/12	238,032	...	105,792	...	634,752	...
11/15	158,688	...	...	...	581,856	...
11/19	52,896	...	...	...	317,376	...
11/22	...	...	...	...	476,064	...
11/26	...	...	...	...	...	...
11/30	...	...	52,896	...	105,792	...
12/ 3	1,600	...	...	...	52,896	...
12/ 6	...	...	3,200	...	...	...
12/10	...	18,400	...	...	19,836	...
12/14	26,448	26,448	...	...	66,120	...
12/17	26,448	26,448	...	...	52,896	...
12/20	26,448	...	...	...	13,224	...
12/24	400	800	...	...	39,672	...
12/27	400	800	...	...	46,284	...
12/31	19,836	...	...	...	39,672	...

1913	Inactis tinctoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria formosa	Oscillatoria sp.
1/ 5	...	...	...	...	800	...
1/ 8	...	...	...	...	800	...
1/12	...	...	...	...	...	...
1/15	...	...	...	...	...	...
1/19	...	...	...	...	...	...
1/22	...	...	800	...	...	...
1/26	...	...	...	...	...	...
1/29	...	...	...	800	400	...
2/ 2	...	...	...	800	...	...
2/ 5	...	...	...	...	...	...
2/ 8	...	...	...	...	...	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Inactis tinctoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria formosa	Oscillatoria sp.
2/12						
2/15						
2/19						800
2/23						
2/26					3,200	
3/1						
3/5						
3/8						
3/12						
3/15				1,600		
3/19					79,344	
3/23						
3/26					52,896	
3/29					3,200	
4/2					3,200	
4/5					1,600	
4/9			3,200		6,400	
4/13						
4/16			1,600		1,600	
4/19					3,200	
4/23					52,896	
4/26						
4/30					1,600	
5/3						
5/7						
5/11						
5/14						
5/17						
5/21			105,792			
5/24			3,200			3,200
5/27		3,200				
5/31						
6/3			3,200	6,400		
6/7				6,400		
6/11						3,200
6/16				6,400		105,792
6/18				3,200		
6/21				6,400		
6/25				158,688		
6/28			846,336	317,376		
7/3			211,584	2,226,336		1,600
7/5			12,800	793,440		
7/9			105,792	787,648		105,792
7/12			264,480	476,064		3,200
7/16			317,376	793,440		211,584
7/19			264,480	740,544		370,272
7/23			264,480	171,488		317,376
7/26			264,480	528,960		476,064
7/30			211,584	323,776		317,376
8/2		3,200	105,792	3,200		476,064
8/6		6,400	3,200	370,272		476,064
8/9			105,792	264,480		317,376
8/13	793,440		158,688	1,005,024		1,692,672
8/15			6,400	476,064		528,960
8/20	211,584		3,200	423,168		1,692,672
8/23	211,584		6,400	370,272		1,110,816
8/27	264,480			581,856		846,336
8/31	211,584			1,005,024		2,221,632
9/2	3,226,656		105,792	899,232		2,062,944
9/6	6,876,480			899,232		1,216,608

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Inactis tinctoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria formosa	Oscillatoria sp.
9/ 9	5,130,912	...	...	264,480	...	899,232
9/13	5,501,184	...	...	846,336	...	1,216,608
9/17	4,231,680	...	317,376	423,168	...	105,792
9/20	6,876,480	105,792	158,688	264,480	...	1,110,816
9/24	6,559,104	...	...	476,064	...	370,272
9/27	4,337,472	...	52,896	52,896	...	740,544
10/ 1	2,433,216	...	105,792	...	...	370,272
10/ 4	2,221,632	...	105,792	158,688	...	105,792
10/ 8	1,428,192	...	52,896	158,688	...	317,376
10/11	1,163,712	52,896	105,792	6,400	...	105,792
10/15	1,216,608	...	6,400	...	...	528,960
10/18	476,064	...	...	...	...	105,792
10/22	846,336	...	6,400	...	...	370,272
10/26	105,792	...	52,896	...	...	...
10/29	317,376	...	6,400	6,400	...	211,584
11/ 1	264,480	634,752	105,792	6,400	...	52,896
11/ 5	...	370,272	6,400	52,896	...	52,896
11/ 8	158,688	264,480	52,896	...	...	52,896
11/12	79,344	3,358,896	...	...	...	52,896
11/15	158,688	1,269,504	52,896	...	...	...
11/19	52,896	528,960	...	3,200	...	52,896
11/22	52,896	634,752	...	...	...	158,688
11/26	...	634,752	...	...	...	...
11/30	...	105,792	1,600	...	...	...
12/ 3	...	343,824	3,200	...	...	52,896
12/ 6	1,600	211,584	...	1,600	...	79,344
12/10	...	92,568	...	...	...	26,448
12/14	...	132,240	...	...	...	33,060
12/17	...	238,032	...	...	...	33,060
12/20	...	105,792	...	...	...	39,672
12/24	...	33,060	400	...	800	13,224
12/27	...	99,180	...	...	...	52,896
12/31	...	79,344	...	...	...	13,224

1913	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae	Actinastrum hantzschii	Actinastrum hantzschii (large)
1/ 5	...	13,224	...	14,024	...	...
1/ 8	1,200	...	...	2,000	...	...
1/12	...	...	...	...	...	...
1/15	...	...	...	...	...	...
1/19	...	400	...	800	...	...
1/22	800	800	...	3,200	800	...
1/26	...	26,848	...	27,248	...	...
1/29	...	800	...	2,000	...	...
2/ 2	...	13,624	...	14,824	400	...
2/ 5	...	400	...	2,800	...	...
2/ 8	...	39,672	...	40,472	...	...
2/12	...	26,448	...	26,448	...	...
2/15	26,448	370,272	...	396,720	...	...
2/19	...	92,568	...	94,168	1,600	...
2/23	...	238,032	...	277,704	...	...
2/26	...	238,032	...	244,432	...	...
3/ 1	3,200	79,344	...	85,744	...	...
3/ 5	...	158,688	...	211,584	...	...
3/ 8	...	318,976	...	318,976	...	...
3/12	...	...	...	...	...	...
3/15	...	158,688	...	213,184	...	...
3/19	1,600	238,032	...	318,976	52,896	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae	Actinastrum hantzschii	Actinastrum hantzschii (large)
3/23	1,600	79,344	...	80,944	52,896	...
3/26	...	238,032	...	290,928	1,600	...
3/29	...	105,792	...	110,592	...	...
4/ 2	...	158,688	...	163,488	3,200	...
4/ 5	...	185,136	...	239,632	...	...
4/ 9	...	158,688	...	175,688	1,600	...
4/13	...	6,400	...	11,200	...	...
4/16	52,896	264,480	...	322,176	...	...
4/19	1,600	158,688	...	165,088	...	...
4/23	...	79,344	...	185,136	52,896	...
4/26	...	3,200	...	92,144	...	3,200
4/30	...	...	...	1,600	...	...
5/ 3	185,136	...	...	267,680	...	3,200
5/ 7	1,600	1,600	...	14,400	...	3,200
5/11	52,896	52,896	...	160,288	3,200	...
5/14	105,792	...	...	320,576	...	...
5/17	317,376	...	...	323,776	...	...
5/21	3,200	...	6,400	379,872	...	...
5/24	370,272	...	3,200	488,864	6,400	...
5/27	105,792	3,200	...	323,776	...	...
5/31	158,688	...	...	168,288	3,200	3,200
6/ 3	...	...	...	1,391,296	105,792	3,200
6/ 7	...	...	6,400	884,736	3,200	...
6/11	3,200	...	...	859,136	...	...
6/16	3,200	...	...	461,568	...	...
6/18	105,792	...	...	859,136	105,792	...
6/21	3,200	158,688	...	1,226,208	3,200	...
6/25	3,200	264,480	...	1,886,560	3,200	3,200
6/28	211,584	3,200	...	2,436,416	...	...
7/ 3	...	...	...	3,127,168	105,792	...
7/ 5	12,800	...	...	1,559,584	3,200	...
7/ 9	...	...	...	2,164,240	3,200	...
7/12	370,272	...	...	4,763,840	6,400	12,800
7/16	...	...	...	4,919,328	...	105,792
7/19	...	...	...	2,648,002	...	19,200
7/23	105,792	...	...	1,262,208	...	6,400
7/26	...	...	...	2,750,602	3,200	105,792
7/30	...	...	...	1,543,584	...	6,400
8/ 2	3,200	...	...	703,648	...	6,400
8/ 6	...	...	...	1,114,016	...	12,800
8/ 9	158,688	...	...	1,391,296	...	19,200
8/13	264,480	528,960	...	4,659,632	...	264,480
8/15	3,200	...	105,792	1,666,376	...	6,400
8/20	105,792	158,688	12,800	3,049,056	...	158,688
8/23	...	211,584	...	2,704,096	3,200	158,688
8/27	...	105,792	...	2,803,488	3,200	370,272
8/31	3,200	...	...	3,936,704	...	158,688
9/ 2	3,200	1,110,816	...	8,046,592	...	12,800
9/ 6	211,584	1,481,088	...	11,438,336	...	3,200
9/ 9	211,584	952,128	...	8,198,880	...	3,200
9/13	3,200	528,960	...	8,806,832	3,200	6,400
9/17		317,376	...	5,877,856	...	6,400
9/20	...	264,480	...	9,580,576	211,584	6,400
9/24	52,896	1,163,712	...	9,309,696	...	105,792
9/27	...	158,688	...	6,036,544	52,896	12,800
10/ 1	...	423,168	...	4,290,368	52,896	264,480
10/ 4	...	105,792	...	3,550,432	...	476,064
10/ 8	52,896	634,752	...	3,332,448	...	158,688
10/11	6,400	581,856	...	2,446,016	...	158,688
10/15	476,064	105,792	...	2,545,408	...	158,688

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae	Actinastrum hantzschii	Actinastrum hantzschii (large)
10/18	370,272	105,792		1,110,816		211,584
10/22	317,376	423,168		2,016,448	6,400	105,792
10/26	52,896			370,272		264,480
10/29	6,400			812,640	105,792	211,584
11/ 1				1,699,072		211,584
11/ 5	6,400			912,032		52,896
11/ 8				793,440		
11/12		52,896		4,284,576	1,600	
11/15				2,063,144	52,896	
11/19	52,896			1,008,224	105,792	
11/22	3,200	52,896		1,388,496	79,344	
11/26	1,600	52,896		689,248	132,240	52,896
11/30	79,344	1,600		347,024	52,896	
12/ 3	3,200	185,136		641,152	3,200	
12/ 6				297,328		
12/10	400	400		158,052		
12/14	800	400	1,600	260,668		
12/17	13,224	400		364,060	400	
12/20	105,792	400		264,880		400
12/24	400		800	89,156	400	
12/27	26,448			225,608		
12/31	13,224			145,464		

1913	Coelastrum microporum	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum	Richteriella botryoides
1/ 5		6,612	6,612			
1/ 8		800	400			
1/12			400			
1/15		400	400		400	
1/19		1,200	1,200			
1/22		1,600	4,800			
1/26			400			
1/29		800	19,836			
2/ 2		800	13,224			
2/ 5		3,200	2,400	13,224		
2/ 8		4,800	5,600			
2/12		4,800	6,400			
2/15			11,200			800
2/19		39,672	92,568	1,600	52,896	
2/23		26,448	26,448			
2/26		6,400	79,344	1,600		
3/ 1		6,400	3,200		79,344	
3/ 5			12,800			3,200
3/ 8		1,600	12,800	6,400		
3/12		9,600	6,400			
3/15	3,200	9,600	22,400		1,600	
3/19		79,344	132,240		1,600	
3/23		3,200	9,600		52,896	
3/26		9,600	16,000		1,600	
3/29		3,200	9,600		3,200	
4/ 2		12,800	6,400			
4/ 5	3,200	3,200	79,344	3,200	1,600	
4/ 9			6,400		6,400	
4/13		9,600	6,400		4,800	
4/16			16,000		79,344	
4/19			1,600		79,344	
4/23		1,600	3,200		132,240	
4/26			16,000		132,240	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Coelastrum microporum	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum	Richteriella botryoides
4/30		6,400	6,400		79,344	
5/3			3,200		105,792	
5/7			6,400		1,600	
5/11			105,792		107,392	1,600
5/14		6,400			108,992	
5/17		6,400	6,400		108,992	
5/21			19,200	6,400	158,688	
5/24		6,400	6,400		317,376	
5/27		3,200	12,800		264,480	
5/31	264,480		6,400		743,744	
6/3	158,688	105,792	12,800		211,584	
6/7		3,200	32,000		105,792	
6/11			158,688		317,376	
6/16			25,600		528,960	
6/18		3,200	6,400			
6/21	370,272		158,688		634,752	
6/25		3,200	317,376		264,480	3,200
6/28		6,400	370,272		3,200	
7/3			793,440		4,800	
7/5	6,400		476,064	3,200		
7/9	158,688	6,400	1,005,024		108,992	
7/12	158,688		1,269,504		3,200	
7/16	105,792		793,440	12,800	264,480	
7/19	105,792	12,800	740,544		3,200	
7/23	211,584		634,752	158,688	6,400	
7/26	476,064	6,400	793,440	19,200	267,680	
7/30	211,584		740,544	3,200	3,200	
8/2	105,792	3,200	476,064	6,400	105,792	
8/6	211,584	12,800	264,480		323,776	
8/9	211,584	3,200	793,440		3,200	
8/13	105,792		423,168	6,400	264,480	
8/15	211,584		317,376		3,200	
8/20	423,168		211,584		105,792	
8/23	634,752		476,064	3,200	211,584	
8/27	528,960	3,200	105,792		6,400	
8/31	634,752		105,792		370,272	
9/2	1,005,024	12,800	634,752	6,400	479,264	
9/6	2,221,632		634,752	211,584	211,584	105,792
9/9	2,697,696	105,792	687,648	105,792	264,480	
9/13	3,544,032	105,792	476,064		264,480	
9/17	1,163,712	6,400	423,168	12,800	267,680	
9/20	793,440	6,400	740,544		211,584	
9/24	264,480	12,800	1,851,360	25,600	317,376	
9/27	476,064		793,440	6,400	317,376	
10/1	423,168		952,128	6,400	317,376	
10/4	317,376	12,800	1,110,816	19,200	370,272	52,896
10/8	158,688	105,792	1,798,464	6,400	376,672	
10/11	211,584	12,800	2,010,048		171,488	
10/15	52,896		1,533,984			
10/18			476,064		158,688	52,896
10/22	158,688	6,400	740,544	52,896		105,792
10/26	12,800		793,440			52,896
10/29	211,584	19,200	846,336	12,800	264,480	52,896
11/1	158,688	6,400	528,960	6,400	317,376	52,896
11/5	52,896	12,800	952,128		6,400	
11/8		6,400	158,688	52,896	370,272	
11/12	52,896	52,896	317,376		872,784	
11/15	264,480	52,896	6,400		423,168	
11/19	79,344	12,800	52,896		158,688	
11/22	28,800	6,400	238,032		105,792	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Coelastrum microporum	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum	Richteriella botryoides
11/26	6,400	6,400	32,000		79,344	
11/30	52,896	1,600	79,344		1,600	
12/ 3	79,344	3,200	52,896		105,792	
12/ 6	3,200	1,600	19,200		54,496	
12/10	800	800	19,836		59,908	
12/14	800	800	33,060		13,224	400
12/17			400		53,296	
12/20			13,224	800	46,284	
12/24		1,600	13,224		13,224	
12/27		1,600	39,672		119,016	
12/31			33,060		85,956	

1913	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera	Selenastrum bibraianum	Stigeoclonium sp.	Ulothrix sp.
1/ 5	6,612					
1/ 8						
1/12						
1/15	400					
1/19		400				
1/22		33,060		400		
1/26	13,224			400		
1/29		400				
2/ 2		400				
2/ 5		13,224				
2/ 8		800				
2/12		1,600		800		
2/15		52,896		52,896		
2/19	800	52,896				
2/23	800	39,672				
2/26		132,240				
3/ 1	3,200	6,400				
3/ 5	1,600	79,344				
3/ 8		6,400				
3/12		52,896				
3/15		132,240				
3/19		3,200				
3/23		105,792				3,200
3/26		3,200				
3/29		3,200				
4/ 2		6,400				
4/ 5		105,792			3,200	3,200
4/ 9	1,600	79,344				
4/13		6,400				
4/16		158,688				
4/19		52,896				
4/23		132,240				
4/26	6,400	132,240				
4/30	52,896	52,896	1,600			
5/ 3		1,600				
5/ 7	79,344	52,896	1,600			
5/11	1,600	185,136				
5/14		317,376				
5/17	3,200	19,200	3,200			
5/21	264,480	264,480				
5/24	211,584	1,057,920	3,200			
5/27	423,168	1,216,608	105,792			
5/31	1,322,400	3,385,344	105,792			
6/ 3	2,591,904	2,539,008	105,792			

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera	Selenastrum bibraianum	Stigeoclonium sp.	Ulothrix sp.
6/ 7	1,957,152	2,697,696	317,376			
6/11	634,752	1,533,984	158,688			
6/16	423,168	1,110,816	3,200			
6/18	634,752	1,745,568	264,480			
6/21	370,272	2,909,280	264,480	3,200		
6/25	899,232	2,803,488	105,792			
6/28	1,110,816	2,803,488	105,792			
7/ 3	740,544	1,163,712	158,688			
7/ 5	158,688	370,272			3,200	
7/ 9	211,584	634,752				
7/12	211,584	476,064				
7/16	423,168	1,375,296				
7/19	528,960	952,128				
7/23	105,792	581,856	105,792			
7/26	687,648	1,005,024	105,792			
7/30	317,376	634,752	3,200			
8/ 2	105,792	899,232	3,200			
8/ 6	158,688	634,752				
8/ 9		581,856				
8/13	370,272	1,639,776	264,480			
8/15	264,480	899,232				
8/20	211,584	581,856				
8/23	423,168	1,110,816	3,200			
8/27	528,960	1,216,608				
8/31	423,168	846,336				
9/ 2	581,856	1,322,400				
9/ 6	476,064	1,057,920				
9/ 9	528,960	1,163,712				
9/13	476,064	1,533,584				
9/17	370,272	1,163,712				
9/20	687,648	1,428,192				
9/24	264,480	1,586,880	52,896			
9/27	528,960	1,639,776	52,896			
10/ 1	1,057,920	2,062,944				
10/ 4	740,544	1,533,984				
10/ 8	581,856	1,428,192				
10/11	1,057,920	952,128	105,792			
10/15	687,648	1,269,504	52,896			
10/18	687,648	1,057,920				
10/22	687,648	1,375,296	52,896			
10/26	793,440	1,533,984				
10/29	1,428,192	1,957,152	264,480			
11/ 1	687,648	2,115,840	105,792			
11/ 5	1,005,024	3,438,240	6,400			
11/ 8	158,688	899,232	105,792			
11/12	899,232	2,644,800	317,376			
11/15	476,064	1,163,712	317,376			
11/19	185,136	846,336				
11/22	290,928	925,680				
11/26	185,136	370,272	1,600			
11/30	158,688	661,200	1,600			
12/ 3	317,376	185,136				
12/ 6	16,000	396,720				
12/10	19,836	112,404				
12/14	99,180	211,584	13,224			
12/17	52,896	132,240	400			
12/20	66,120	178,528	26,448			
12/24	13,224	66,120	13,224			
12/27	26,448	99,180	13,224			
12/31	19,836	132,240	19,836			

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Total Chlorophyceae	Asterionella gracillima	Asterionella gracillima (large)	Amphiprora alata	Bacillairia paradoxa	Cocconeis pediculus
1/ 5	19,836	707,484	......	......	6,612	
1/ 8	1,200	257,868	......	......	......	......
1/12	400	528,960	......	......		......
1/15	1,600	2,254,692	19,836	......		
1/19	2,800	4,350,696	400	13,224	......	
1/22	40,660	740,544	......	......	46,284	......
1/26	14,024	238,032	......	......	......	......
1/29	21,036	1,071,144	......	......	1,600	......
2/ 2	14,824	1,031,472	......	......	6,400	......
2/ 5	32,448	985,188	......	13,224	......	
2/ 8	11,200	1,044,696	......	......		
2/12	13,600	251,256	......	52,896		......
2/15	117,792	859,560	......	26,448	......	......
2/19	242,032	1,097,592	......	26,448		
2/23	93,368	370,272	......	800	......	......
2/26	219,584	4,496,616	......	......	......	1,600
3/ 1	98,544	528,960	......	3,200	......	......
3/ 5	96,944	290,928	......	......		
3/ 8	27,200	132,240				......
3/12	68,896	......	......	......		
3/15	169,040	370,272	......	1,600		
3/19	279,280	132,240	......	1,600		......
3/23	224,384	185,136	6,612	1,600	......	......
3/26	32,000	158,688	......	......		......
3/29	19,200	581,856	......	......	......	
4/ 2	28,800	79,344	......	......	3,200	
4/ 5	196,336	105,792	......	1,600	3,200	
4/ 9	96,944	105,792	26,448	1,600		
4/13	25,600	16,000	1,600	1,600	3,200	......
4/16	255,632	105,792	......	......		......
4/19	133,840	26,448	......	......		
4/23	375,072	132,240	......			
4/26	290,080	132,240	......			
4/30	201,136	......	......			......
5/ 3	113,792	1,600	......			
5/ 7	145,040	502,512	......	......	......	......
5/11	404,720	52,896	714,096	1,600	......	......
5/14	432,768	105,792	264,480	......	......	......
5/17	147,392	211,584	370,272	......	......	......
5/21	713,248	211,584	3,200	......	......	......
5/24	1,873,760	12,800	......	3,200	......	......
5/27	2,026,048	158,688	3,200	158,688	......	......
5/31	5,834,560	......	......	3,200		......
6/ 3	5,829,760	158,688	3,200	......		......
6/ 7	5,116,416	105,792	......		......	......
6/11	2,803,488	211,584	105,792	......	......	......
6/16	1,091,744	423,168	423,168	3,200		
6/18	2,750,192	528,960	476,064	......		
6/21	4,714,144	423,168	264,480	......		
6/25	4,603,168	476,064	158,688	105,792		
6/28	4,399,968	634,752	264,480	3,200		
7/ 3	2,966,976	105,792	3,200	......	......	......
7/ 5	1,021,024	......	......	3,200	......	
7/ 9	2,131,840	......	......	......	......	
7/12	2,138,232	......	......	3,200		
7/16	3,080,768	......	......	......	12,800	......
7/19	2,362,624	......	......	6,400	57,600	
7/23	1,811,264	......	......	......		......
7/26	3,470,240	......	......	3,200	211,584	......
7/30	1,920,256	......	......	3,200	......	......

Table 1.—Organisms Per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Total Chlorophyceae	Asterionella gracillima	Asterionella gracillima (large)	Amphiprora alata	Bacillairia paradoxa	Cocconeis pediculus
8/ 2	1,710,872	.....	.....	.....	32,000	
8/ 6	1,618,880	.....	.....	.....	3,200	
8/ 9	1,612,480	.....	.....	.....	.....	
8/13	3,338,948	3,200	.....	.....	6,400	
8/15	1,702,272	.....	.....	.....	12,800	
8/20	1,692,672	105,792	.....	.....	.....	
8/23	3,024,672	.....	.....	.....	25,600	
8/27	2,763,392	.....	.....	.....	105,792	
8/31	2,538,988	.....	.....	.....	25,600	
9/ 2	4,048,296	.....	.....	.....	6,400	
9/ 6	4,922,528	.....	.....	.....	6,400	
9/ 9	5,557,280	.....	.....	3,200	6,400	
9/13	6,410,016	.....	.....	3,200	6,400	
9/17	3,414,944	.....	.....	105,792	.....	
9/20	3,085,784	.....	.....	52,896	52,896	
9/24	4,481,664	.....	.....	.....	6,400	
9/27	3,880,608	.....	.....	52,896	52,896	
10/ 1	5,137,312	.....	.....	.....	12,800	
10/ 4	4,633,952	.....	.....	.....	32,000	
10/ 8	4,667,636	.....	.....	.....	6,400	52,896
10/11	4,680,448	.....	.....	.....		
10/15	3,755,616	.....	.....	52,896	6,400	
10/18	2,591,904	.....	.....	.....		
10/22	3,312,352	.....	.....	105,792	6,400	
10/26	3,451,040	.....	.....	52,896		52,896
10/29	5,324,496	52,896	.....	12,800		
11/ 1	4,191,584	.....	.....	105,792		
11/ 5	5,526,784	52,896	.....	158,688		
11/ 8	1,851,968	.....	.....	.....		
11/12	5,211,856	.....	.....	1,600		
11/15	2,809,888	.....	.....	.....		
11/19	1,441,592	79,344	79,344	1,600		
11/22	1,674,976	3,200	9,600	52,896	9,600	
11/26	866,288	.....	.....	1,600		
11/30	1,009,824	.....	1,600		6,400	
12/ 3	746,944	1,507,536	1,600	.....		
12/ 6	491,216	1,401,744	52,896	1,600	52,896	
12/10	213,584	614,916	.....	400	800	
12/14	372,272	198,360	390,108	39,672	19,836	
12/17	239,632	185,136	400	13,224		
12/20	331,800	105,792	.....	26,448	26,448	800
12/24	121,016	85,956	.....	13,224	2,400	400
12/27	299,140	59,508	.....	33,060	800	
12/31	290,928	19,836	.....	.....	4,000	

1913	Cyclotella spp.	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis	Cymbella parva	Cymbella sp.
1/ 5	257,868					
1/ 8	106,592	.....	.....	.....	.....	
1/12	317,376	.....	.....	.....		
1/15	793,440	.....				
1/19	1,573,656	.....				
1/22	449,616	.....	.....	.....		800
1/26	204,972	.....				
1/29	257,868	.....	.....	.....		
2/ 2	158,688	.....	.....	.....		
2/ 5	357,048	.....				800
2/ 8	304,152					

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cyclotella spp.	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis	Cymbella parva	Cymbella sp.
2/12	740,544			1,600		
2/15	1,150,488					800
2/19	1,401,744			1,600		
2/23	886,008					
2/26	3,570,480					3,200
3/ 1	5,210,256					
3/ 5	5,659,872	3,200				
3/ 8	1,613,328		1,600	3,200		
3/12	2,697,696					
3/15	1,110,816					
3/19	2,168,736					
3/23	2,724,144			3,200		1,600
3/26	1,163,712					
3/29	925,680					
4/ 2	925,680				3,200	
4/ 5	2,459,664				1,600	
4/ 9	6,162,384					
4/13	3,570,480	3,200				
4/16	9,151,008					
4/19	10,684,992					
4/23	15,472,080					
4/26	15,286,944					
4/30	18,116,880					
5/ 3	20,391,408			3,200		
5/ 7	19,597,968					
5/11	32,610,384		1,600			
5/14	60,248,544					
5/17	43,216,032					
5/21	36,022,176					
5/24	35,704,800					
5/27	54,482,880					
5/31	53,001,792		3,200			
6/ 3	57,286,368					
6/ 7	60,195,648					
6/11	59,349,312		105,792	3,200		
6/16	38,508,288					3,200
6/18	42,475,488					
6/21	34,646,880					
6/25	36,974,304					
6/28	51,362,016			6,400		
7/ 3	35,175,840					
7/ 5	14,281,920					
7/ 9	12,324,768					
7/12	16,768,032					
7/16	45,755,040					
7/19	24,279,264					
7/23	11,742,912			6,400		
7/26	17,349,888		3,200			
7/30	15,168,800					
8/ 2	14,916,672					
8/ 6	9,838,656					
8/ 9	10,790,784					
8/13	14,229,024					
8/15	6,770,688					
8/20	12,113,184					
8/23	14,440,608					
8/27	20,047,584					
8/31	21,898,944					
9/ 2	12,166,080					
9/ 6	12,166,080					

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cyclotella spp.	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis	Cymbella parva	Cymbella sp.
9/ 9	12,166,080		3,200			
9/13	15,128,256					
9/17	14,493,504					
9/20	13,065,312					
9/24	14,757,984					
9/27	19,677,312					
10/ 1	21,687,360					
10/ 4	12,695,040					
10/ 8	18,090,432	6,400				
10/11	22,851,072					
10/15	20,788,128					
10/18	25,866,144					
10/22	28,246,464			6,400		
10/26	34,276,608					
10/29	31,853,392			6,400		
11/ 1	12,589,248	6,400				
11/ 5	9,203,904					
11/ 8	7,775,712		6,400			
11/12	11,240,400		1,600			
11/15	7,722,816					
11/19	7,061,616		3,200	3,200		
11/22	7,697,968	3,200	3,200			
11/26	6,692,944					
11/30	6,876,480					
12/ 3	6,955,824					
12/ 6	4,522,608					
12/10	1,970,376		400			
12/14	2,281,140					
12/17	2,499,336					
12/20	2,737,368					800
12/24	1,283,128	400		800		
12/27	2,876,220			800		
12/31	1,838,136					

1913	Cymbella tumida	Diatom unidentified	Diatoma vulgare	Epithemia ocellata	Fragillaria capucina	Fragillaria crotonensis
1/ 5						
1/ 8						
1/12						
1/15					800	
1/19					800	
1/22				400		
1/26		400				
1/29						
2/ 2						
2/ 5					800	
2/ 8						
2/12		26,448				
2/15					1,600	
2/19		800			1,600	
2/23	800				800	
2/26					1,600	
3/ 1					3,200	
3/ 5						
3/ 8				3,200		
3/12						
3/15					6,400	
3/19	3,200	1,600			1,600	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cymbella tumida	Diatom unidentified	Diatoma vulgare	Epithemia ocellata	Fragillaria capucina	Fragillaria crotonensis
3/23	3,200	1,600			3,200	
3/26		1,600			3,200	
3/29					3,200	
4/ 2					3,200	
4/ 5					1,600	
4/ 9						
4/13	3,200				3,200	
4/16		1,600			1,600	
4/19		1,600				
4/23		1,600				
4/26	1,600				6,400	3,200
4/30	52,896				1,600	
5/ 3					3,200	
5/ 7					3,200	
5/11						
5/14	6,400					
5/17	25,200					
5/21						
5/24						
5/27				6,400		
5/31						
6/ 3						
6/ 7		6,400	3,200			
6/11						
6/16				6,400		
6/18						
6/21						
6/25					6,400	
6/28						
7/ 3						
7/ 5						
7/ 9						
7/12						
7/16	6,400			6,400		
7/19						
7/23					6,400	
7/26						
7/30						
8/ 2				6,400		
8/ 6					12,800	
8/ 9					6,400	
8/13				3,200		
8/15						
8/20					3,200	
8/23						
8/27	6,400			6,400		
8/31			3,200			
9/ 2						
9/ 6					6,400	
9/ 9				6,400		
9/13				6,400		
9/17				6,400	3,200	
9/20						
9/24						
9/27						
10/ 1						
10/ 4						
10/ 8					6,400	
10/11						
10/15	105,792	105,792		6,400		

Table 1.—Organisms Per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Cymbella tumida	Diatom unidentified	Diatoma vulgare	Epithemia ocellata	Fragillaria capucina	Fragillaria crotonensis
10/18						
10/22						
10/26	6,400					
10/29						6,400
11/ 1				6,400		
11/ 5				6,400	6,400	
11/ 8	6,400					
11/12						
11/15				6,400		
11/19				3,200		
11/22				3,200	3,200	
11/26					3,200	
11/30				6,400	3,200	
12/ 3				6,400		
12/ 6	1,600					
12/10	1,600					
12/14						
12/17						
12/20	800			400		
12/24						
12/27	800			800		
12/31	800			1,600		

1913	Fragillaria sp.	Gomphonema constrictum	Gomphonema sp.	Gyrosigma acuminatum	Gyrosigma kiitzingii	Gyrosigma scalproides
1/ 5					6,612	
1/ 8						
1/12						
1/15						
1/19						
1/22					400	
1/26						
1/29						
2/ 2						
2/ 5						
2/ 8						
2/12						800
2/15						
2/19						
2/23						
2/26						1,600
3/ 1						
3/ 5					1,600	
3/ 8						
3/12						
3/15						
3/19						
3/23						
3/26				52,896		
3/29						
4/ 2					1,600	
4/ 5						
4/ 9		1,600				
4/13				3,200		
4/16			1,600			
4/19						
4/23					1,600	
4/26						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Fragillaria sp.	Gomphonema constrictum	Gomphonema sp.	Gyrosigma acuminatum	Gyrosigma kützingii	Gyrosigma scalproides
4/30						
5/ 3						
5/ 7					1,600	
5/11					52,896	
5/14						
5/17	6,400				3,200	
5/21						
5/24						3,200
5/27						
5/31				3,200		
6/ 3						
6/ 7						
6/11						
6/16						
6/18						
6/21						
6/25						3,200
6/28						
7/ 3						
7/ 5						
7/ 9						
7/12						
7/16						
7/19						
7/23						
7/26						
7/30						
8/ 2					25,600	
8/ 6						
8/ 9						3,200
8/13						158,688
8/15				6,400		264,480
8/20						3,200
8/23					3,200	6,400
8/27						158,688
8/31					3,200	105,792
9/ 2	3,200					158,688
9/ 6				6,400	105,792	12,800
9/ 9					6,400	
9/13					6,400	6,400
9/17		3,200				6,400
9/20						105,792
9/24						105,792
9/27						52,896
10/ 1				52,896		
10/ 4					25,600	
10/ 8		52,896			12,800	
10/11					6,400	6,400
10/15		52,896				105,792
10/18						105,792
10/22					12,800	
10/26					12,800	
10/29						
11/ 1						
11/ 5						
11/ 8					52,896	
11/12						
11/15						
11/19			3,200			
11/22						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Fragillaria sp.	Gomphonema constrictum	Gomphonema sp.	Gyrosigma acuminatum	Gyrosigma kiitzingii	Gyrosigma scalproides
11/26					1,600	
11/30					3,200	1,600
12/ 3			1,600			1,600
12/ 6						
12/10					800	1,600
12/14		400				800
12/17						400
12/20						
12/24					800	13,224
12/27		13,224	400		400	19,836
12/31		13,224				13,224

1913	Melosira granulata	Melosira granulata A (small)	Melosira varians	Navicula affinis	Navicula alpestris	Navicula bacillum
1/ 5	19,836		26,448			
1/ 8	26,448					
1/12	2,400					
1/15	13,224					
1/19	26,448		2,800			
1/22	1,322,400		800		800	
1/26	33,060					
1/29	125,628		800			
2/ 2	72,732					
2/ 5	204,972		400			
2/ 8	132,240					
2/12	145,464					
2/15	304,152		1,600			
2/19	542,184		3,200	1,600		
2/23	119,016		26,448			
2/26	476,064		3,200			
3/ 1	343,824					
3/ 5	132,240		3,200			
3/ 8	264,480		3,200			
3/12	158,688					
3/15	793,440		6,400		52,896	
3/19	1,031,472		79,344		52,896	
3/23	793,440		6,400			
3/26	476,064	185,136	3,200			
3/29	502,512	317,376	9,600			
4/ 2	502,512	211,584	132,240			52,896
4/ 5	132,240		1,600			
4/ 9	634,752		52,896			
4/13	952,128		6,400		1,600	
4/16	872,784	317,376				
4/19	528,960					
4/23	2,274,528	238,032	1,600		1,600	52,896
4/26	3,702,720	1,600	9,600			3,200
4/30	449,616				1,600	52,896
5/ 3	449,616	52,896				
5/ 7	343,824	1,600	3,200		1,600	1,600
5/11	343,824		3,200		52,896	105,792
5/14	581,856	211,584				105,792
5/17	1,269,504	158,688	6,400		3,200	105,792
5/21	1,163,712		3,200			
5/24	1,005,024	105,792	3,200			3,200
5/27	1,375,296	317,376				211,584
5/31	317,376	105,792			3,200	158,688
6/ 3	634,752	105,792				105,792

Table 1.—Organisms Per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Melosira granulata	Melosira granulata A (small)	Melosira varians	Navicula affinis	Navicula alpestris	Navicula bacillum
6/7	528,960				3,200	
6/11	370,272					211,584
6/16	1,322,400					264,480
6/18	1,375,296					211,584
6/21	634,752				6,400	
6/25	2,062,944					3,200
6/28	7,617,024		6,400			158,688
7/3	3,067,968		6,400			3,200
7/5	1,005,024					3,200
7/9	1,481,088					
7/12	2,697,696					3,200
7/16	1,586,880					105,792
7/19	2,168,736					
7/23	1,428,192					
7/26	2,962,176					
7/30	2,539,008					
8/2	3,914,304					3,200
8/6	3,385,344					
8/9	4,972,224					
8/13	10,314,720				3,200	105,792
8/15	10,103,136				3,200	3,200
8/20	5,342,496				6,400	158,688
8/23	4,760,640					211,584
8/27	6,083,040					105,792
8/31	8,357,568					3,200
9/2	7,828,608					211,584
9/6	16,556,448					158,688
9/9	10,420,512					264,480
9/13	5,025,120					370,272
9/17	8,251,776					105,792
9/20	8,410,464					105,792
9/24	15,604,320			52,896	105,792	105,792
9/27	5,183,808					264,480
10/1	8,145,984				6,400	264,480
10/4	5,236,704					52,896
10/8	8,040,192				52,896	52,896
10/11	5,289,600		6,400		105,792	
10/15	7,828,608				6,400	264,480
10/18	4,601,952				52,896	158,688
10/22	4,654,848					
10/26	3,544,032				52,896	52,896
10/29	2,750,592				52,896	211,584
11/1	2,010,048					
11/5	1,798,464				52,896	52,896
11/8	899,232					264.480
11/12	1,137,264					1,600
11/15	1,005,024					105,792
11/19	740,544					52,896
11/22	978,576					52,896
11/26	1,137,264					
11/30	1,084,368				1,600	52,896
12/3	1,745,568		3,200			1,600
12/6	1,057,920				1,600	
12/10	350,436		2,400			33,060
12/14	257,868		400			400
12/17	337,212					33.060
12/20	370,272		800		400	19,836
12/24	271,092		800		800	39,672
12/27	588,468		26,448		400	
12/31	925,680		33,060		13,224	46,284

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Navicula dubia	Navicula gracilis	Navicula sp.	Navicula viridis	Nitzschia acicularis	Nitzschia angularis
1/ 5						
1/ 8					400	
1/12			400			
1/15			13,224	400	13,224	
1/19			33,060		13,224	
1/22				800	400	
1/26		400			13,224	
1/29					26,848	
2/ 2		13,224			19,836	
2/ 5		13,224			13,224	
2/ 8		800			27,248	
2/12		39,672			26,448	
2/15		800			26,448	
2/19		39,672			120,616	
2/23		39,672	800			
2/26		1,600			3,200	
3/ 1		1,600			107,392	
3/ 5			52,896			
3/ 8		1,600	3,200		3,200	
3/12		52,896	52,896		3,200	
3/15		105,792			1,600	
3/19		1,600			79,344	
3/23		105,792			1,600	
3/26		105,792			79,344	
3/29		52,896			1,600	
4/ 2		79,344			79,344	
4/ 5			52,896			
4/ 9		105,792	1,600			
4/13		1,600			4,800	
4/16		52,896	1,600		80,944	
4/19		52,896			1,600	
4/23					211,584	
4/26		52,896	1,600		185,136	
4/30		79,344			264,480	
5/ 3					79,344	
5/ 7		1,600			317,376	
5/11		52,896			290,928	
5/14		105,792			952,128	
5/17		158,688	3,200		1,533,984	6,400
5/21		3,200			2,644,800	
5/24		264,480		6,400	5,289,600	
5/27					15,181,152	
5/31		317,376			20,999,712	
6/ 3		264,480			23,221,344	
6/ 7		3,200			11,055,264	
6/11		3,200			11,108,160	
6/16		105,792			13,752,960	
6/18		211,584			19,624,416	
6/21		370,272			14,969,568	6,400
6/25		158,688			11,901,600	
6/28		211,584			11,108,160	
7/ 3		211,584			10,050,240	
7/ 5					4,284,576	
7/ 9		3,200		3,200	2,909,280	
7/12					4,866,432	
7/16		370,272			5,035,120	
7/19		211,584			4,125,888	
7/23		3,200			2,380,320	
7/26		423,168			6,982,272	
7/30		370,272			3,755,616	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Navicula dubia	Navicula gracilis	Navicula sp.	Navicula viridis	Nitzschia acicularis	Nitzschia angularis
8/ 2	6,400	264,480			3,385,344	
8/ 6		158,688			3,702,720	
8/ 9	3,200	264,480			3,279,552	
8/13		2,539,008			6,453,312	
8/15		952,128			1,586,880	
8/20		1,269,504			634,752	
8/23		1,110,816			1,005,024	
8/27	3,200	793,440			2,539,008	
8/31		1,322,400			4,760,640	
9/ 2		1,163,712			5,236,704	
9/ 6	3,200	846,336			3,596,928	
9/ 9		846,336			2,115,840	
9/13		476,064			1,904,256	
9/17		370,272			2,010,048	
9/20		846,336			2,750,592	
9/24		899,232			3,332,448	
9/27		476,064	52,896		2,750,592	
10/ 1		528,960			3,120,864	
10/ 4					1,533,984	
10/ 8		52,896			1,745,568	
10/11		264,480			1,904,256	
10/15		158,688			2,062,944	
10/18		158,688			2,221,632	
10/22	52,896	52,896			2,062,944	
10/26		158,688			1,163,712	
10/29		105,792			1,745,568	
11/ 1					1,322,400	
11/ 5					1,005,024	
11/ 8					1,322,400	
11/12		52,896			3,173,760	
11/15					1,851,360	
11/19		79,344		3,200	1,719,120	
11/22		105,792			2,062,944	
11/26		79,344			2,036,496	
11/30		105,792			2,062,944	
12/ 3					1,163,712	
12/ 6		105,792		3,200	1,666,224	3,200
12/10		19,836			568,632	
12/14		46,284			416,556	
12/17		39,672			310,764	
12/20	800	46,284			138,852	
12/24		46,284			119,016	
12/27		66,120			145,464	
12/31		92,568		400	79,344	

1913	Nitzschia sigma	Nitzschia sigmoidea	Nitzschia vermicularis	Pleurostauron parvulum	Stauroneis phoenicenteron	Stephonodiscus sp.
1/ 5				6,612		
1/ 8			400	800		
1/12				400		
1/15				26,448		
1/19			400	39,672		
1/22	19,836			26,448	800	400
1/26				26,448		
1/29				26,448		
2/ 2				400		
2/ 5				46,284	800	
2/ 8				26,448		

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Nitzschia sigma	Nitzschia sigmoidea	Nitzschia vermicularis	Pleurostauron parvulum	Stauroneis phoenicenteron	Stephonodiscus sp.
2 12						
2 15			1,600	26,448		
2 19		3,200		39,672		
2 23	800			800		
2 26				1,600		
3 1			1,600	52,896		
3 5				52,896		
3 8		1,600		79,344		
3 12				79,344		
3 15				105,792		
3 19				105,792		
3 23				132,240		
3 26						
3 29				1,600		
4 2				1,600		
4 5				79,344		
4 9						
4 13				1,600		
4 16				158,688		
4 19				158,688		
4 23	1,600			52,896		
4 26				79,344		
4 30				52,896		
5 3				52,896		3,200
5 7				79,344		
5 11		1,600		1,600		
5 14				158,688		
5 17	6,400			211,584	6,400	
5 21				105,792		
5 24				211,584		
5 27	6,400				3,200	105,792
5 31						
6 3				3,200		
6 7				3 200		
6 11				3,200		
6 16	6,400			211,584		
6 18				3,200		
6 21						
6 25				105,792		
6 28						
7 3		3,200				
7 5						
7 9						
7 12						
7 16						
7 19						
7 23						
7 26						
7 30						
8 2	6,400					
8 6						
8 9	3,200					
8 13						
8 15						
8 20	3 200					
8/23				3,200		
8/27						
8/31		400				
9/2						
9 6	3,200			105,792		

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Nitzschia sigma	Nitzschia sigmoidea	Nitzschia vermicularis	Pleurostauron parvulum	Stauroneis Phoenicenteron	Stephonodiscus sp.
9/ 9	...	...	6,400	...		...
9/13	...	...	6,400	...	...	...
9/17	...	...	...		...	...
9/20	...	...	6,400		...	...
9/24	105,792	...	6,400	...		...
9/27	52,896	...	...	...	...	...
10/ 1	...	...	...	105,792	...	...
10/ 4	...	...	...	...	...	...
10/ 8	...	...	19,200	...	...	...
10/11	6,400	...	...	52,896	...	...
10/15	12,800	...	12,800		...	...
10/18	52,896	...	52,896			...
10/22	...	...	...	52,896	...	...
10/26	...	...		105,792		...
10/29	...			52,896		...
11/ 1	...				...	...
11/ 5	12,800			52,896		...
11/ 8	...	...				...
11/12	...	...	...	79,344		...
11/15	...	...	6,400	...		...
11/19	...	...	...	52,896		...
11/22	3,200	...	1,600	...		...
11/26	...	...	...	1,600	...	...
11/30	3,200	...	...	105,792	...	...
12/ 3	3,200	...	...	1,600	...	...
12/ 6	...	...	3,200	...	...	...
12/10	800	...	...	33,060	...	...
12/14	19,836	...	...	26,448	...	...
12/17	800	...	...	19,836	...	...
12/20	39,672	...	...	33,060	400	
12/24	800	...	...	400	...	...
12/27	39,672	...	...	26,448	400	
12/31	...	...	800	26,448	...	

1913	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium acerosum	Closterium rostratum
1/ 5	...		132,240	1,163,712	...	
1/ 8	...	...	59,508	452,016	...	...
1/12	...	...	66,120	915,656		
1/15	...	...	138,852	3,275,140		
1/19	...	...	198,360	6,253,140	...	
1/22	3,200	...	211,584	2,858,572	400	
1/26	...	...	257,868	774,404	400	
1/29	400	...	251,256	1,761,992		
2/ 2	...	...	152,076	1,454,828	...	...
2/ 5	1,600	...	310,764	1,948,328	...	...
2/ 8	800	...	132,240	1,668,624	1,600	...
2/12	...	...	370,272	1,656,200	...	...
2/15	800	...	436,092	2,837,136	...	...
2/19	4.800	...	357,048	3.641,776	...	...
2/23	3,200	...	317,376	1,766,792	...	...
2/26	6,400	...	528,960	5,049,120	...	...
3/ 1	...	...	581,856	6,834,784	...	...
3/ 5	3,200	...	211,584	6,621,600	...	...
3/ 8	...	...	238,032	2,348,224	...	...
3/12	3.200	...	158,688	3,206,608	...	...
3/15	...	...	370,272	2,925,280	...	...
3/19	3,200	...	290,928	4,263,892	...	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium acerosum	Closterium rostratum
3/26	....		396,720	2,441,216	....	
3/29	12,800		105,792	2,567,808	....	....
4/2	3,200		264,480	2,343,424	....	
4/5	....		370,272	3,209,808	....	....
4/9	3,200		185,136	7,360,544	....	....
4/13	52,896		79,344	4,706,048	....	
4/16		....	396,720	11,142,608	....	....
4/19	....	....	158,688	11,613,872	....	....
4/23		....	714,096	19,156,352	....	
4/26	3,200		132,240	19,654,816	....	....
4/30		....	132,240	19,204,448	....	....
5/3	6,400		581,856	21,622,416	....	....
5/7	....		290,928	21,166,352	....	....
5/11	1,600	....	132,240	34,420,048	....	....
5/14	6,400	....	687,648	63,435,104	....	....
5/17	211,584		2,010,048	49,630,352	....	....
5/21	....		687,648	40,739,520	....	....
5/24	19,200		423,168	43,227,536	....	....
5/27	25,600		1,957,152	74,204,992	....	....
5/31	3,200		1,110,816	75,971,456	....	3,200
6/3	....		846,336	82,633,152	....	....
6/7	....		1,375,296	73,280,160	....	....
6/11			1,110,816	72,582,912	....	....
6/16	6,400	....	899,232	55,939,872	....	....
6/18	6,400		1,110,816	66,023,808	....	....
6/21	....		476,064	51,797,984	....	....
6/25		....	1,692,672	53,755,136	....	....
6/28	3,200	....	2,856,384	74,338,080	6,400	....
7/3	....	....	1,533,984	50,161,408	....	....
7/5	....	....	423,168	20,001,088	....	....
7/9	6,400	....	476,064	17,204,000	....	....
7/12	....		423,168	24,761,728	....	....
7/16	3,200	4,496,160	634,792	58,002,816	....	....
7/19	....	634,752	317,376	31,801,600	....	....
7/23	3,200	581,856	528,960	16,675,040	....	....
7/26	105,792	899,232	687,648	29,637,760	....	....
7/30	6,400	423,168	528,960	23,495,424	6,400	3,200
8/2	....	370,272	423,168	23,354,240	....	....
8/6	....	634,752	423,168	18,159,328	6,400	105,792
8/9	105,792	1,005,024	528,960	20,966,016	....	211,584
8/13	6,400	2,750,592	2,062,944	39,059,648	3,200	423.168
8/15	6,400	740,544	1,005,024	21,613,568	6,400	19,200
8/20	6,400	846,336	952,128	21,815,552	....	105,792
8/23	....	740,544	1,375,296	31,965,184	....	6,400
8/31	12,800	2,115,840	1,375,296	39,987,680	....	105,792
9/2	6,400	1,481,088	1,322,400	29,588,064	....	211,584
9/6	12,800	634,752	2,539,008	36,761,024	3,200	264,480
9/9	....	687,648	1,057,920	27,590,816	....	3,200
9/13	158,688	740,544	1,533,984	25,372,384	....	6,400
9/17	....	687,648	687,648	26,731,680	....	105,792
9/20	....	952,128	846,336	27,194,944	....	105,792
9/24	19,200	1,639,776	793,440	37,535,264	....	52,896
9/27	52,896	1,322,400	423,168	30,415,200	....	6,400
10/1	6,400	1,692,672	1,216,608	36,841,216	6,400	6,400
10/4	52,896	1,375,296	1,375,296	22,379,712	....	....
10/8	19,200	1,481,088	1,216,608	30,908,768	....	....
10/11	12,800	1,692,672	1,375,296	33,574,464	....	6,400
10/15	158,688	1,269,504	2,803,488	35,802,496	....	52,896
10/18	19,200	1,005,024	1,322,400	35,512,416	6,400	....
10/22	....	1,269,504	846,336	37,370,176	6,400	....

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium acerosum	Closterium rostratum
10/26	6,400	846,336	528,960	40,861,312	......	......
10/29	12,800	793,440	793,440	38,450,896	......	105,792
11/1	105,792	740,544	211,584	17,098,208	......	......
11/5	6,400	528,960	528,960	13,467,584	......	......
11/8	6,400	634,752	264,480	11,233,152	......	......
11/12	1,600	1,243,056	476,064	17,409,184	......	52,896
11/15	......	158,688	105,792	10,962,272	......	......
11/19	3,200	290,928	370,272	10,547,104	......	6,400
11/22	52,896	79,344	423,168	11,546,480	......	......
11/26	3,200	132,240	211,584	10,301,072	......	1,600
11/30	3,200	158,688	396,720	10,874,080	......	1,600
12/3	......	79,344	925,680	12,398,464	......	1,600
12/6	6,400	1,600	158,688	9,041,168	......	3,200
12/10	......	39,672	113,204	3,751,992	1,600	......
12/14	800	52,896	191,784	3,943,552	......	......
12/17	400	33,060	125,628	3,598,928	800	400
12/20	4,000	52,896	370,272	3,976,400	......	......
12/24	19,836	33,060	138,852	2,071,744	......	......
12/27	46,284	46,284	621,528	4,627,788	......	......
12/31	26,448	26,448	509,124	3,671,048	......	......

1913	Closterium sp.	Mougeotia sp.	Staurastrum A	Straurastrum sp.	Total Conjugatae	Total Algae
1/5	......	......	......	......	......	1,197,572
1/8	400	......	......	......	400	456,016
1/12	......	......	......	......	400	916,456
1/15	......	......	......	......	......	3,277,140
1/19	......	......	......	......	......	6,283,188
1/22	......	......	800	......	21,036	2,923,468
1/26	......	......	......	......	800	816,476
1/29	......	......	......	......	......	1,785,028
2/2	......	......	......	......	......	1,484,476
2/5	......	......	......	......	......	1,963,576
2/8	......	......	......	......	1,600	1,721,896
2/12	800	......	......	......	800	1,697,048
2/15	......	800	......	......	1,600	3,354,048
2/19	......	......	1,600	......	1,600	3,979,576
2/23	......	......	800	......	800	2,138,664
2/26	......	......	......	......	......	5,513,136
3/1	......	......	1,600	......	600	7,021,272
3/5	......	......	......	......	......	6,930,128
3/8	......	......	......	......	......	2,694,400
3/12	......	......	......	......	......	3,275,504
3/15	......	......	......	......	......	3,307,504
3/19	......	......	3,200	......	3,200	4,551,808
3/23	......	......	......	......	3,200	4,572,420
3/26	......	......	......	......	......	2,764,144
3/29	......	......	......	......	......	2,697,600
4/2	......	......	1,600	......	1,600	2,537,312
4/5	......	......	......	......	6,400	3,652,176
4/9	......	......	......	......	......	7,633,176
4/13	......	......	......	......	......	4,742,848
4/16	......	......	......	......	......	11,720,416
4/19	......	......	......	......	......	11,912,800
4/23	......	3,200	......	......	3,200	19,719,760
4/26	......	......	3,200	......	3,200	20,040,240
4/30	......	......	......	......	......	19,407,184

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Closterium sp.	Mougeotia sp.	Staurastrum A	Straurastrum sp.	Total Conjugatae	Total Algae
5/3						22,003,888
5/7						21,327,392
5/11						34,986,656
5/14						64,188,448
5/17						50,101,520
5/21						41,832,640
5/24						45,590,160
5/27						76,558,011
5/31					3,200	82,083,296
6/3						89,857,408
6/7		6,400		3,200	9,600	79,290,912
6/11						76,248,736
6/16			6,400		6,400	57,502,784
6/18						69,738,928
6/21				3,200	3,200	57,741,536
6/25		105,792			108,992	60,357,056
6/28			105,792		112,192	81,289,856
7/3						56,258,752
7/5			3,200		6,400	22,693,888
7/9			6,400		6,400	21,500,080
7/12		3,200			3,200	31,667,000
7/16		3,200	6,400		9,600	66,012,512
7/19						36,812,226
7/23		3,200			9,590	19,758,102
7/26				3,200	6,400	35,865,002
7/30						26,959,264
8/2						25,771,960
8/6					112,192	21,004,416
8/9		158,688		158,688	528,960	24,498,752
8/13		846,336		3,200	1,275,904	48,334,132
8/15		846,336	3,200		875,136	25,866,952
8/20		476,064			581,856	27,142,336
8/23		370,272			634,752	29,838,048
8/27		264,480	3,200		274,080	37,911,936
8/31		476,064			581,856	47,045,228
9/2		1,745,568			1,967,352	43,650,304
9/6		1,639,776	105,792		2,013,248	55,138,336
9/9		264,480	6,400		274,080	41,621,056
9/13		158,688			165,088	40,754,320
9/17		158,688	6,400		270,880	36,295,360
9/20					105,792	39,967,096
9/24			211,584	52,896	317,376	51,644,000
9/27		52,896	52,896		112,192	50,444,544
10/1			12,800		1,263,104	47,584,896
10/4			6,400		6,400	30,570,496
10/8		52,896	105,792	52,896	211,584	39,120,434
10/11		52,896	6,400		72,096	40,825,920
10/15		105,792	52,896		211,584	42,368,000
10/18		52,896	52,896	52,896	165,088	39,380,224
10/22			12,800		19,200	42,718,176
10/26			52,896		52,896	44,788,416
10/29			52,896		158,688	44,852,512
11/1						23,147,552
11/5			12,800		12,800	20,024,992
11/8						13,931,456
11/12			1,600		1,600	27,145,248
11/15						15,993,992
11/19		1,600	1,600		9,600	13,059,416
11/22		1,600			1,600	14,611,552
11/26		1,600			3,200	11,859,808

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Closterium sp.	Mougeotia sp.	Staurastrum A	Straurastrum sp.	Total Conjugatae	Total Algae
11/30	...	...	...	...	1,600	12,232,528
12/ 3	...	...	6,400	...	8,000	13,796,160
12/ 6	...	...	...	...	3,200	9,832,912
12/10	...	...	...	...	21,336	4,144,964
12/14	...	...	...	...	...	4,602,940
12/17	...	...	...	...	1,200	4,230,268
12/20	...	...	...	...	...	4,599,528
12/24	...	...	400	...	400	2,282,716
12/27	...	400	...	...	400	5,153,036
12/31	...	...	...	...	...	4,127,276

1913	Total Chlorophyll bearing	Ceratium hirundinella	Cercomonas crassicauda	Cercomonas sp.	Chlamydomonas sp.	Chromulina sp.
1/ 5	1,197,572	...	...	...	...	...
1/ 8	456,016	...	...	...	...	...
1/12	917,256	...	...	...	...	...
1/15	4,255,716	...	...	...	...	945,516
1/19	7,257,952	...	...	...	...	958,740
1/22	3,024,248	...	...	...	...	99,180
1/26	1,059,168	...	...	...	...	251,256
1/29	2,079,556	...	...	...	...	271,092
2/ 2	1,513,724	...	...	...	...	13,224
2/ 5	2,157,088	...	...	...	...	152,076
2/ 8	2,259,656	...	...	...	...	462,840
2/12	1,950,704	...	...	...	...	251,256
2/15	3,675,424	...	...	...	...	317,376
2/19	5,542,136	...	...	...	...	1,481,088
2/23	2,528,560	...	...	...	...	277,704
2/26	6,268,080	...	...	...	...	687,648
3/ 1	7,113,336	...	...	...	...	423,168
3/ 5	7,019,072	...	...	...	...	...
3/ 8	2,755,296	...	...	...	...	1,600
3/12	3,322,000	...	...	...	...	...
3/15	3,488,592	...	...	...	...	79,344
3/19	4,599,504	...	...	...	...	...
3/23	4,686,212	...	...	...	...	...
3/26	3,117,568	...	...	...	...	158,688
3/29	3,179,968	...	...	...	...	423,168
4/ 2	2,697,600	...	...	...	...	79,344
4/ 5	3,666,576	...	...	...	...	1,600
4/ 9	7,647,576	...	...	...	...	...
4/13	4,755,648	...	...	...	...	1,600
4/16	12,156,384	...	...	...	...	317,376
4/19	11,976,896	...	...	...	...	52,896
4/23	20,939,568	...	...	...	...	290,928
4/26	20,254,224	...	...	...	...	158,688
4/30	19,542,624	...	...	...	...	132,240
5/ 3	22,294,816	...	...	...	...	79,344
5/ 7	21,378,688	...	...	...	...	52,896
5/11	35,355,328	...	...	...	...	132,240
5/14	64,300,640	...	...	...	...	105,792
5/17	50,683,376	...	...	...	...	317,376
5/21	42,053,824	...	...	...	...	...
5/24	45,854,640	...	...	...	...	...
5/27	77,086,976	...	...	...	3,200	264,480
5/31	83,517,888	...	...	...	...	1,322,400
6/ 3	90,601,152	...	...	...	...	105,792

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Total Chlorophyll bearing	Ceratium hirundinella	Cercomonas crassicauda	Cercomonas sp.	Chlamydomonas sp.	Chromulina sp.
6/7	80,295,936					105,792
6/11	77,356,352					211,584
6/16	58,996,672					899,232
6/18	71,136,624					634,752
6/21	58,441,984					370,272
6/25	61,801,248					581,856
6/28	83,154,016					740,544
7/3	59,196,832					1,428,192
7/5	24,657,440					634,752
7/9	24,516,656					2,486,112
7/12	37,862,232					4,919,328
7/16	71,364,608		3,200			5,183,808
7/19	43,853,794				105,792	6,929,376
7/23	23,044,054					3,173,760
7/26	44,063,882					7,299,648
7/30	31,213,344		3,200			3,279,552
8/2	30,601,496					3,967,200
8/6	25,992,640					3,226,656
8/9	27,411,232					1,481,088
8/13	56,819,882		3,200			6,347,520
8/15	32,637,640					4,231,680
8/20	37,612,544					6,876,480
8/23	38,727,776			3,200		6,770,688
8/27	46,325,600				423,168	5,289,600
8/31	58,364,972			264,480	370,272	5,554,080
9/2	58,853,856			1,533,984	687,648	7,722,816
9/6	71,957,264			370,272	105,792	10,579,200
9/9	64,266,944			423,168		11,531,328
9/13	62,388,784			211,584		13,224,000
9/17	57,307,872	3,200	3,200	158,688		17,825,952
9/20	49,541,272		52,896			5,977,248
9/24	59,108,736					6,559,104
9/27	55,149,632					9,785,760
10/1	59,909,664					9,151,008
10/4	37,200,696	6,400				5,342,496
10/8	45,580,140	6,400				4,813,536
10/11	47,708,800	6,400				4,549,056
10/15	46,335,128					2,539,008
10/18	45,833,536					5,395,392
10/22	48,536,736					4,813,536
10/26	49,760,640					4,231,680
10/29	52,006,272					6,612,000
11/1	31,041,856					7,299,648
11/5	25,526,176					5,448,288
11/8	20,151,680					5,977,248
11/12	40,772,368					12,906,624
11/15	23,200,648		52,896			6,347,520
11/19	18,674,392		1,600			5,104,464
11/22	20,426,064					5,210,256
11/26	14,403,616					2,089,392
11/30	15,549,728					2,856,384
12/3	16,574,800					2,221,632
12/6	11,905,456		1,600			1,957,152
12/10	5,169,854					806,664
12/14	5,796,300					859,560
12/17	5,633,212		132,240			932,292
12/20	5,321,200				400	621,528
12/24	3,422,780				400	932,292
12/27	6,502,284					971,964
12/31	5,146,724					641,364

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cryptomonas sp.	Dinobryon sertularia	Eudorina elegans	Euglena deses	Euglena viridis	Flagellate unidentified
1/ 5						
1/ 8			400			
1/12			800			
1/15			400			
1/19			2,000			
1/22			800			
1/26			800			
1/29		400	2,400			
2/ 2			2,400			
2/ 5			1,600			19,836
2/ 8			8,000			
2/12			1,600			
2/15			1,600			
2/19		1,600	20,800		1,600	800
2/23			6,400		26,448	
2/26			9,600		1,600	1,600
3/ 1			9,600			
3/ 5			9,600			
3/ 8			3,200			
3/12			1,600		1,600	
3/15			16,000			
3/19			3,200		1,600	
3/23			3,200			52,896
3/26			9,600			
3/29			57,600			
4/ 2			79,344			
4/ 5			9,600			
4/ 9			6,400			
4/13			9,600			
4/16			9,600			
4/19			3,200			
4/23			1,600			
4/26			3,200			
4/30					1,600	
5/ 3						
5/ 7						
5/11					105,792	
5/14					3,200	
5/17					105,792	
5/21			3,200			
5/24						
5/27						
5/31			6,400			
6/ 3			6,400			
6/ 7						
6/11						
6/16			6,400			
6/18			19,200			
6/21			6,400			
6/25			12,800		158,688	3,200
6/28			12,800			
7/ 3			32,000			
7/ 5					3,200	
7/ 9			19,200		211,584	
7/12			6,400		793,440	
7/16			6,400		158,688	
7/19					6,400	
7/23					105,792	
7/26					370,272	
7/30			6,400		423,168	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cryptomonas sp.	Dinobryon sertularia	Eudorina elegans	Euglena deses	Euglena viridis	Flagellate unidentified
8/2					105,792	
8/6				6,400	476,064	
8/9					264,480	
8/13					3,200	
8/15						
8/20					158,688	
8/23					158,688	
8/27						105,792
8/31					105,792	
9/2					158,688	
9/6					264,480	
9/9					105,792	
9/13						
9/17						
9/20	317,376				158,688	
9/24			6,400			
9/27	476,064				211,584	
10/1	158,688		6,400		158,688	
10/4	105,792		105,792		52,896	
10/8			19,200		105,792	
10/11			3,200		105,792	
10/15				52,896		
10/18						
10/22	211,584					
10/26						
10/29	52,896			6,400		
11/1					6,400	
11/5						
11/8					6,400	
11/12	264,480			3,400	79,344	
11/15	105,792			6,400	6,400	
11/19	79,344		3,200		79,344	
11/22	185,136		3,200		12,800	
11/26	185,136		1,600			
11/30	132,240	3,200	3,200			
12/3	52,896		1,600			
12/6	1,600		3,200		3,200	
12/10	66,120		13 224			
12/14	400	400				
12/17	99,180		800			
12/20	26,448					
12/24	59,508		800		800	
12/27	66,120		800			
12/31	112,404		400			

1913	Hemidinium nasutum	Mallomonas sp.	Pandorina morum	Peridinium cinctum	Peridinium sp.	Phacus pleuronectes
1/5						
1/8						
1/12						
1/15			13,224			
1/19			800			
1/22						
1/26						
1/29			800			
2/2			13,224			
2/5						
2/8			26,448			

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Hemidinium nasutum	Mallomonas sp.	Pandorina morum	Peridinium cinctum	Peridinium sp.	Phacus pleuronectes
2/12						
2/15			1,600	800		
2/19			16,000			
2/23						
2/26						
3/ 1			6,400			
3/ 5						
3/ 8						
3/12			3,200			
3/15			6,400			
3/19						
3/23			3,200			
3/26			79,344			
3/29						
4/ 2						
4/ 5			1,600			
4/ 9			6,400			
4/13			1,600			
4/16			3,200			
4/19			1,600			
4/23			1,600			
4/26			3,200			
4/30						
5/ 3						
5/ 7						
5 11		52,896		105,792		
5/14						
5/17						
5/21			6,400			
5/24						
5/27						
5/31						
6/ 3					158,688	
6/ 7					211,584	
6/11						
6/16			3,200		158,688	
6/18			3,200	317,376	3,200	
6/21						
6/25						
6/28				105,792		
7/ 3				423,168		
7/ 5		3,200		1,005,024		
7/ 9				3,200		
7/12						
7/16						
7/19						
7/23						
7/26				317,376		
7/30	52,896			3,200		
8/ 2	634,752					
8/ 6	1,163,712					
8/ 9	952,128					
8/13				105,792		
8/15	1,745,568		3,200			
8/20	2,168,736					
8/23	1,533,984					
8/27	2,380,320			3,200		
8/31	4,125,888			158,688		
9/ 2	4,178,784	3,200		370,272		
9/ 6	4,866,432			3,200		

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Hemidinium nasutum	Mallomonas sp.	Pandorina morum	Peridinium cinctum	Peridinium sp.	Phacus pleuronectes
9/9	9,679,968			105,792		
9/13	7,617,024			105,792		
9/17	2,221,632			3,200		
9/20	2,433,216					
9/24	528,960			52,896		
9/27	3,861,408			52,896		
10/1	2,168,736			52,896		264,480
10/4	528,960			52,896		158,688
10/8	317,376					158,688
10/11	1,481,088			52,896		105,792
10/15	264,480			52,896		52,896
10/18	211,584					
10/22						
10/26						
10/29	52,896					52,896
11/1				52,896		476,064
11/5				52,896		
11/8						211,584
11/12			52,896			52,896
11/15						370,272
11/19				1,600		238,032
11/22	1,600					238,032
11/26				1,600		52,896
11/30			3,200			52,896
12/3			1,600			52,896
12/6						
12/10			19,836			26,448
12/14			2,400			26,448
12/17						13,224
12/20						19,836
12/24			400			400
12/27						13,224
12/31						400

1913	Platydorina caudata	Pleodorina californica	Pteromonas sp.	Spondylomorum quarternarium	Synura uvella	Trachelomonas euchlora
1/5						
1/8						
1/12						
1/15						
1/19						
1/22						
1/26						800
1/29						
2/2						
2/5						
2/8						
2/12						
2/15						
2/19						39,672
2/23						39,672
2/26						52,896
3/1						
3/5						
3/8					3,200	
3/12						1,600
3/15						
3/19						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Platydorina caudata	Pleodorina californica	Pteromonas sp.	Spondylomorum quarternarium	Synura uvella	Trachelomonas euchlora
3/23						52,896
3/26						52,896
3/29						1,600
4/ 2						1,600
4/ 5						1,600
4/ 9						
4/13						
4/16						105,792
4/19				3,200		1,600
4/23						476,064
4/26						52,896
4/30						1,600
5/ 3						105,792
5/ 7						
5/11						
5/14						3,200
5/17						
5/21						
5/24						158,688
5/27						
5/31						
6/ 3						158,688
6/ 7						
6/11						
6/16						3,200
6/18						158,688
6/21			158,688			3,200
6/25						3,200
6/28						
7/ 3						
7/ 5			158,688			
7/ 9			32,000			
7/12						
7/16						
7/19						
7/23						
7/26			105,792			
7/30						
8/ 2	6,400	6,400			3,200	3,200
8/ 6					6,400	3,200
8/ 9			3,200			
8/13	6,400	6,400	105,792		3,200	
8/15					3,200	
8/20			158,688			
8/23			3,200		264,480	
8/27						
8/31						
9/ 2	12,800				6,400	
9/ 6						
9/ 9	6,400				105,792	
9/13						
9/17					3,200	
9/20			211,584		158,688	
9/24						
9/27						
10/ 1						
10/ 4	6,400					
10/ 8			52,896		52,896	
10/11					52,896	
10/15						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Platydorina caudata	Pleodorina californica	Pteromonas sp.	Spondylomorum quarternarium	Synura uvella	Trachelomonas euchlora
10/18						
10/22						
10/26						
10/29	6,400					
11/ 1						
11/ 5						
11/ 8						
11/12						
11/15						
11/19					3,200	
11/22						
11/26						
11/30						1,600
12/ 3						
12/ 6						
12/10						
12/14						
12/17						400
12/20					400	
12/24				13,224		
12/27						
12/31						400

1913	Trachelomonas sp.	Trachelomonas volvocina	Total Mastigophora	Amoeba proteus	Amoeba radiosa	Arcella vulgaris
1/ 5						
1/ 8	………	………	400			
1/12			800	800		
1/15	………	19,836	978,976			
1/19	………	39,672	1,001,212	400		
1/22	400	400	100,780			
1/26	………	19,836	272,692			
1/29	………	19,836	294,528			
2/ 2	………	400	29,248			
2/ 5	………	………	173,512			800
2/ 8	800	39,672	537,760			
2/12	………	800	253,656			
2/15	………	800	322,176			
2/19			1,561,560			1,600
2/23	………	39,672	389,896			
2/26	………	1,600	754,944			
3/ 1	………	52,896	493,664			
3/ 5	………	79,344	88,944			
3/ 8	………	52,896	60,896			
3/12	………	52,896	60,896			
3/15	………	79,344	181,088			
3/19	………	52,896	57,696			
3/23	………	1,600	113,792			
3/26	………	52,896	353,424	1,600		
3/29	………	………	482,368			
4/ 2	………	………	160,288			
4/ 5	………	………	14,400			
4/ 9	………	1,600	14,400			
4/13	………	………	12,800			3,200
4/16	………	………	435,968			
4/19	………	1,600	64,096			
4/23	………	370,272	1,219,808	3,200		
4/26	………	………	217,984			

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Trachelomonas sp.	Trachelomonas volvocina	Total Mastigophora	Amoeba proteus	Amoeba radiosa	Arcella vulgaris
4/30			135,440	...	1,600	
5/ 3		105,792	290,928	1,600	79,344	
5/ 7			52,896	...	1,600	
5/11		79,344	370,272	...	1,600	
5/14	3,200		112,192			
5/17		264,480	581,856		...	
5/21		211,584	221,184		3,200	
5/24		105,792	264,480			
5/27		264,480	532,160			
5/31		211,584	1,540,384			
6/ 3		317,376	746,944			
6/ 7		687,648	1,005,024	...	...	
6/11		793,440	1,110,816	...	3,200	
6/16		423,168	1,497,088			
6/18		264,480	1,503,488			
6/21		158,688	700,448			
6/25		687,648	1,447,392			
6/28		1,005,024	1,867,360			
7/ 3		1,057,920	2,941,280	...		
7/ 5		264,480	2,069,344	6,400		
7/ 9		264,480	3,016,576			
7/12		476,064	6,195,232			3,200
7/16			5,352,096			
7/19		...	7,041,568			
7/23		3,200	3,285,952			
7/26		105,792	8,198,880			
7/30		...	4,244,480			
8/ 2		105,792	4,832,736			
8/ 6		105,792	4,988,224			
8/ 9		211,584	2,912,480	...		
8/13		1,057,920	8,485,750	158,688		
8/15		793,440	6,780,288	105,792		
8/20		1,110,816	10,473,408			
8/23		158,688	8,892,928			
8/27		317,376	8,519,456			
8/31		740,544	11,319,744			
9/ 2		528,960	15,203,552		...	
9/ 6		634,752	16,824,128		3,200	6,400
9/ 9		687,648	22,645,888			
9/13		476,064	21,634,464	...	...	
9/17		793,440	21,012,512	...	158,688	
9/20		264,480	9,574,176		211,584	
9/24		317,376	7,464,736			
9/27		317,376	14,705,088			
10/ 1		423,168	12,377,664		52,896	
10/ 4		370,272	6,630,200			
10/ 8		952,128	6,459,712			
10/11		581,856	6,935,776		52,896	
10/15		1,057,920	4,020,024			
10/18		846,336	6,453,312			
10/22		793,440	5,818,560		211,584	
10/26		740,544	5,025,120		476,064	
10/29		476,064	7,259,552	6,400	370,272	
11/ 1		211,584	8,052,992		264,480	
11/ 5			5,606,976			6,400
11/ 8		158,688	6,373,120			
11/12		502,512	13,865,152			
11/15		476,064	7,365,344			
11/19		158,688	5,667,872			
11/22		158,688	5,814,512	3,200		

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Trachelomonas sp.	Trachelomonas volvocina	Total Mastigophora	Amoeba proteus	Amoeba radiosa	Arcella vulgaris
11/26		211,584	2,543,808			
11/30		264,480	3,317,200			
12/ 3		449,616	2,780,240			3,200
12/ 6		105,792	2,072,544			
12/10		112,404	1,024,860			
12/14		330,600	1,219,808		400	
12/17		370,272	1,429,392	400		
12/20		59,508	748,120	400		
12/24		132,240	1,140,464	400	400	
12/27		297,540	1,349,648			
12/31		284,316	1,039,284			

1913	Difflugia corona	Difflugia pyriformis	Hyalodiscus sp.	Hyalosphenia cuneata	Hyalosphenia papilio	Microgromia socialis
1/ 5		13,224				
1/ 8						
1/12						
1/15						
1/19						
1/22		400				
1/26						
1/29						
2/ 2						
2/ 5						
2/ 8						
2/12						
2/15		1,600				
2/19		3,200				4,800
2/23						800
2/26		52,896				
3/ 1					3,200	1,600
3/ 5						
3/ 8						
3/12						
3/15						
3/19						
3/23		1,600				
3/26		1,600				
3/29						1,600
4/ 2		52,896				
4/ 5		52,896				1,600
4/ 9		79,344				
4/13						1,600
4/16						1,600
4/19						
4/23		1,600				79,344
4/26						185,136
4/30		105,792				
5/ 3		1,600				
5/ 7						1,600
5/11		158,688				1,600
5/14		211,584				
5/17	6,400	423,168				
5/21		211,584				
5/24		317,376				
5/27		952,128		3,200		
5/31		370,272		105,792		105,792
6/ 3		1,322,400				

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Difflugia corona	Difflugia pyriformis	Hyalodiscus sp.	Hyalosphenia cuneata	Hyalosphenia papilio	Microgromia socialis
6/ 7		740,544	....	....	3,200	3,200
6/11		158,688	....	....	....	3,200
6/16		423,168	....	....	....	....
6/18		158,688	....	....	....	3,200
6/21		19,200	.			3,200
6/25		581,856	....	....	....	.....
6/28		581,856				
7/ 3		105,792				
7/ 5	.	211,584	.			
7/ 9	.	264,480	.			
7/12	.	.	.			....
7/16	.	.				3,200
7/19	.	3,200				....
7/23			.			105,792
7/26		264,480	.			....
7/30	.					3,200
8/ 2						
8/ 6						
8/ 9		3,200				
8/13						
8/15			....	....	....	105,792
8/20	.....	3,200	....	....	....	.....
8/23	6,400	3,200				
8/27	.....	....	....	....	....	3,200
8/31						
9/ 2		. .				
9/ 6	.					
9/ 9	.....	6,400	3,200	....		
9/13	....	. . . .	3,200	....		
9/17	....	....	....	....	....	105,792
9/20	.	.	158,688			52,896
9/24	.	....	105,792	....	....	52,896
9/27	.....	..	52,896			
10/ 1	.....	....	....	....	....	211,584
10/ 4	.	....	....	....	....	264,480
10/ 8	.....	....	....	....	....	211,584
10/11	. .	....	....	....	....	264,480
10/15	....	105,792	....	....	....	52,896
10/18		.				
10/22			634,752	....	....	211,584
10/26		.	370,272	....	....	....
10/29	....	....	52,896	....	....	211,584
11/ 1	.....	....	....	....	....	52,896
11/ 5			....	....	....	105,792
11/ 8				.		
11/12	3,200	....	132,240	....	....	....
11/15			158,688			
11/19		3,200	1,600	....	....	1,600
11/22				.	.	
11/26				.		.
11/30		.			.	
12/ 3			.			.
12/ 6			1,600	.	.	.
12/10		800	.	.	..	
12/14			.	.	.	
12/17		.		.	. .	
12/20	.	.	.	.	. .	
12/24		400	.	.	.	
12/27	. .	400	....	....	....	.
12/31	. . .	.. .	. . ..	. .....	....	.

Table 1.—Organisms Per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Nebela sp.	Trinema sp.	Total Rhizopoda	Actinophrys sol.	Heterophrys fockei	Heterophrys sp.
1/5			13,224			
1/8						
1/12			800			
1/15						
1/19			400			
1/22			400			
1/26						
1/29						
2/2						
2/5			800			
2/8						
2/12						
2/15			1,600			
2/19			9,600			
2/23			800			
2/26						
3/1			4,800			
3/5						
3/8						
3/12						
3/15			1,600			1,600
3/19			1,600			
3/23			1,600			
3/26			3,200			
3/29			4,800			
4/2			52,896			
4/5			54,496			
4/9			80,944			
4/13			67,696			
4/16			3,200			
4/19						
4/23			163,488			
4/26			238,032			
4/30			107,392			
5/3			82,844			
5/7			3,200			
5/11			161,888			
5/14			211,584			
5/17			429,568			
5/21			214,784			
5/24			317,376			
5/27			955,328			
5/31			781,856			
6/3			1,533,984			
6/7			746,944			
6/11			165,088			
6/16			423,168			
6/18			161,888			
6/21			22,400			
6/25			581,856			
6/28			581,856			
7/3			105,792			
7/5			224,384			
7/9	6,400		270,880			
7/12			3,200			
7/16	105,792		112,192			
7/19	3,200		6,400			
7/23			105,792			
7/26	3,200		267,680			
7/30			3,200		44,800	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Nebela sp.	Trinema sp.	Total Rhizopoda	Actinophrys sol.	Heterophrys fockei	Heterophrys sp.
8/2					528,960	
8/6					105,792	
8/9	105,792		108,992		317,376	
8/13	105,792		846,326		105,792	
8/15			317,376		211,584	211,584
8/20		158,688	161,888			
8/23			168,288		3,200	
8/27			112,192		3,200	
8/31			264,480			
9/2			3,200			
9/6			9,600			
9/9		105,792	115,392			
9/13			3,200			
9/17		3,200	267,680			
9/20			323,168		211,584	
9/24			158,688		211,584	
9/27		105,792	158,688			
10/1			264,480		158,688	
10/4			264,480		264,480	
10/8			211,584		158,688	
10/11			370,272		6,400	
10/15		105,792	370,272		52,896	
10/18					52,896	
10/22			1,163,712	105,792	105,792	
10/26			581,856	581,856		
10/29			858,524	52,896		
11/1		211,584	381,856			
11/5		211,584	323,776			
11/8						
11/12		1,600	137,040			
11/15			158,688			
11/19			6,400			
11/22			3,200			
11/26						
11/30				1,600		
12/3			3,200			
12/6			1,600			
12/10			800			
12/14			400			
12/17			400			
12/20			400			
12/24			1,200			
12/27			400			
12/31						

1913	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans	Total Heliozoa	Askenasia elegans	Bursaria sp.
1/5						
1/8						
1/12						400
1/15						
1/19						
1/22						
1/26						
1/29					400	
2/2						
2/5					800	
2/8					1,600	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans	Total Heliozoa	Askenasia elegans	Bursaria sp.
2/12						
2/15						
2/19						
2/23						
2/26						
3/1						
3/5						
3/8						
3/12					1,600	
3/15				1,600		
3/19	1,600					1,600
3/23						
3/26						
3/29	3,200					
4/2						
4/5						
4/9	1,600					
4/13	52,896					
4/16	1,600					
4/19						
4/23	79,344					
4/26	52,896		52,896	52,896		
4/30			132,240	132,240		3,200
5/3						
5/7			211,584	211,584		
5/11			158,688	158,688		
5/14			3,200	3,200		
5/17						
5/21			1,216,608	1,216,608		
5/24						
5/27						
5/31			3,200	3,200		
6/3						
6/7			740,544	740,544		
6/11			1,005,024	1,005,024		
6/16			1,322,400	1,322,400		
6/18			158,688	158,688		
6/21			264,480	264,480		
6/25			1,851,360	1,851,360		
6/28			740,544	740,544		
7/3			793,440	793,440		
7/5	6,400		528,960	528,960		
7/9			846,336	846,336		
7/12			158,688	158,688		
7/16	3,200		528,960	528,960		
7/19			370,272	370,272		
7/23			317,376	317,376		
7/26			370,272	370,272		
7/30			370,272	415,072		
8/2			1,269,504	1,798,464		
8/6			264,480	370,272		
8/9			423,168	740,544		
8/13	158,688		1,745,568	1,851,360		
8/15			528,960	952,128		
8/20			317,376	317,376		
8/23			1,586,880	1,590,080		
8/27	3,200		105,792	108,992		
8/31			687,648	687,648		
9/2	3,200		211,584	211,584		
9/6						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans	Total Heliozoa	Askenasia elegans	Bursaria sp.
9/ 9						
9/13			3,200	3,200		
9/17						
9/20				211,584		
9/24				211,584		
9/27				211,584		105,792
10/ 1				52,896		
10/ 4				264,480		
10/ 8				158,688		
10/11	52,896	423,168		429,568		
10/15	105,792	52,896		105,792		
10/18		476,064		528,960		
10/22	105,792	370,272		581,856		
10/26	105,792	317,376	211,584	1,110,816		
10/29		370,272		423,168		
11/ 1		476,064		476,064		
11/ 5		105,792	4,549,056	4,654,848		
11/ 8			1,428,192	1,428,192		
11/12		79,344	3,702,720	3,782,064		
11/15		52,896	1,745,568	1,798,464		
11/19			819,888	819,888		
11/22			1,600	1,600		
11/26		52,896	1,600	54,496		
11/30			396,720	398,320		
12/ 3			1,600	1,600		
12/ 6			52,896	52,896		
12/10						
12/14						
12/17						
12/20						
12/24						
12/27			400	400		
12/31						

1913	Chilodon sp.	Ciliate unidentified	Coleps hirtus	Colpoda sp.	Cyclidium sp.	Didinium nasutum
1/ 5						
1/ 8						
1/12						
1/15						400
1/19						
1/22		26,448		400		
1/26		46,284				52,896
1/29		52,896				400
2/ 2		800				
2/ 5		33,060				
2/ 8		3,200				4,800
2/12		52,896				1,600
2/15		66,120				39,672
2/19		1,600				
2/23		26,448	800			3,200
2/26		105,792				1,600
3/ 1		1,600				3,200
3/ 5		52,896				
3/ 8		79,344				
3/12						
3/15						
3/19	1,600	52,896				

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Chilodon sp.	Ciliate unidentified	Coleps hirtus	Colpoda sp.	Cyclidium sp.	Didinium nasutum
3/23		132,240				
3/26						1,600
3/29		3,200				
4/2		6,400				
4/5						
4/9		1,600				
4/13						3,200
4/16		1,600				
4/19				1,600		
4/23						
4/26		1,600				1,600
4/30	3,200					
5/3						
5/7						
5/11						
5/14						
5/17						
5/21						
5/24						
5/27						
5/31						
6/3						
6/7						
6/11						
6/16						
6/18						
6/21						
6/25						
6/28						
7/3				3,200		
7/5				3,200		
7/9						
7/12						
7/16						
7/19						
7/23						
7/26						
7/30						
8/2	3,200					
8/6						
8/9						
8/13					158,688	
8/15					105,792	
8/20					105,792	
8/23					264,480	
8/27				6,400	158,688	
8/31					158,688	
9/2					317,376	
9/6					476,064	
9/9						
9/13					264,480	
9/17					3,200	
9/20						
9/24					264,480	
9/27			52,896		105,792	
10/1					105,792	
10/4					158,688	
10/8					52,896	
10/11					211,584	
10/15						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Chilodon sp.	Ciliate unidentified	Coleps hirtus	Colpoda sp.	Cyclidium sp.	Didinium nasutum
10/18					158,688	
10/22						
10/26						
10/29			264,480			
11/ 1			105,792			
11/ 5						
11/ 8						....
11/12			1,600			32,000
11/15						19,200
11/19						1,600
11/22						
11/26						
11/30						
12/ 3						....
12/ 6	22,400					3,200
12/10						
12/14			132,240			
12/17			119,016			
12/20			66,120			
12/24			19,836			
12/27			400			
12/31						

1913	Enchelys sp.	Euplotes harpa	Euplotes patella	Frontonia sp.	Halteria grandinella	Hastatella radians
1/ 5						
1/ 8						
1/12						
1/15		1,600				
1/19		13,224				
1/22		11,200				
1/26		19,836			52,896	
1/29		33,060			46,284	
2/ 2		13,224			800	
2/ 5		26,448			800	1,600
2/ 8		16,000	800		4,800	
2/12		39,672			1,600	
2/15		158,688	52,896		4,800	52,896
2/19	....	145,464	52,896		1,600	1,600
2/23	1,600	132,240	66,120		3,200	1,600
2 26		132,240	105,792		3,200	3,200
3/ 1		317,376	52,896		105,792	12,800
3/ 5		6,400	......		52,896	
3/ 8		158,688	3,200		3,200	
3/12		79,344	1,600	158,688		
3/15		158,688	12,800		3,200	
3/19		370,272				
3/23		264,480	9,600		9,600	
3/26		79,344				
3/29		35,200				
4/ 2		70,400	3,200			
4/ 5		211,584	9,600		105,792	
4/ 9		132,240				6,400
4/13		25,600				9,600
4/16						9,600
4/19		6,400				105,792
4/23						1,600
4/26		1,600				

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Enchelys sp.	Euplotes harpa	Euplotes patella	Frontonia sp.	Halteria grandinella	Hastatella radians
4/30						
5/3						
5/7						
5/11				3,200		
5/14						
5/17						
5/21						
5/24						
5/27						
5/31						
6/3						
6/7						
6/11						
6/16						
6/18						
6/21						
6/25						
6/28						
7/3						
7/5						
7/9						
7/12						
7/16						
7/19						
7/23						
7/26						
7/30						
8/2						
8/6						
8/9						
8/13						
8/15		12,800				
8/20						
8/23						
8/27						
8/31						
9/2						
9/6						
9/9						
9/13						
9/17						
9/20						
9/24						
9/27						
10/1						
10/4						
10/8						
10/11						
10/15						
10/18						
10/22						
10/26						
10/29		6,400			52,896	
11/1	52,896	44,800				
11/5		19,200			52,896	
11/8		89,600				
11/12		528,960				
11/15		264,480				
11/19		211,584				
11/22	1,600	19,200				

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Enchelys sp.	Euplotes harpa	Euplotes patella	Frontonia sp.	Halteria grandinella	Hastatella radians
11/26		28,800				
11/30		52,896				
12/ 3		9,600				
12/ 6		12,800				
12/10						
12/14	33,060	800				13,224
12/17					400	
12/20						
12/24					800	400
12/27						13,224
12/31					13,224	

1913	Holophrya sp.	Loxophyllum sp.	Paramecium aurelia	Paramecium bursaria	Paramecium caudatum	Pleuronema sp.
1/ 5						
1/ 8						
1/12				400		
1/15			1,200	400		
1/19			26,448	800		
1/22			26,448		400	
1/26			79,344	400		
1/29			72,732			
2/ 2			4,800			
2/ 5			400			
2/ 8			3,200			
2/12	39,672		26,448			
2/15			119,016			
2/19			3,200			
2/23			1,600			
2/26	3,200					
3/ 1						
3/ 5	1,600					
3/ 8	52,896					
3/12	581,856		1,600			
3/15	9,600			9,600		
3/19	238,032	3,200		6,400		
3/23	105,792		3,200	3,200		
3/26	132,240					
3/29	158,688					
4/ 2	290,928					
4/ 5				1,600		
4/ 9	211,584			3,200		
4/13	3,200					
4/16	185,136					
4/19	79,344					
4/23	211,584					
4/26	105,792			3,200		
4/30	211,584					
5/ 3	105,792		3,200			
5/ 7	132,240					
5/11	79,344					
5/14	105,792					
5/17	1,005,024		6,400			
5/21	105,792					
5/24	264,480					
5/27						
5/31						
6/ 3						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Holophrya sp.	Loxophyllum sp.	Paramecium aurelia	Paramecium bursaria	Paramecium caudatum	Pleuronema sp.
6/ 7						
6/11	158,688					
6/16	3,200					
6/18	3,200					
6/21	3,200					
6/25	3,200					
6/28	158,688					
7/ 3	3,200					3,200
7/ 5	158,688					
7/ 9	211,584					
7/12	3,200					
7/16	6,400					
7/19						
7/23						
7/26	211,584					
7/30	105,792					
8/ 2	105,792					
8/ 6	105,792					
8/ 9	740,544					
8/13	634,752					
8/15	317,376					
8/20	105,792					
8/23	158,688					
8/27	105,792					
8/31	3,200					
9/ 2	3,200					
9/ 6	317,376					
9/ 9	211,584					
9/13						
9/17	3,200					
9/20	370,272					
9/24	158,688					
9/27	211,584					
10/ 1	211,584					
10/ 4	52,896					
10/ 8	423,168		6,400			
10/11	105,792					
10/15	105,792					
10/18	105,792					
10/22	370,272					
10/26	52,896					
10/29						
11/ 1	52,896		51,200	264,480		
11/ 5	52,896		70,400			
11/ 8	52,896		96,000	57,600		6,400
11/12	52,896			581,856		132,240
11/15			25,600			6,400
11/19	105,792		79,344	1,600		79,344
11/22	79,344		6,400			79,344
11/26			3,200			105,792
11/30	238,032		3,200			
12/ 3	79,344		19,200	6,400		79,344
12/ 6	1,600			6,400		3,200
12/10			13,224	13,224	4,000	26,448
12/14		800	10,400	800		39,672
12/17	13,224		145,464		9,600	
12/20	72,732		105,792	19,836	13,224	400
12/24	13,224		16,000	3,200	4,800	
12/27	59,508		72,732	13,224	5,600	
12/31	39,672		33,060	19,836		

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Prorodon sp.	Stentor coeruleus	Stentor niger	Tintinnidium fluviatile	Trachelius ovum	Trichodina pediculus
1/ 5		800	6,612			
1/ 8		400	1,200			
1/12		1,200	2,000			
1/15		33,060	26,448			
1/19		52,896	39,672			
1/22		72,732	112,404		800	
1/26		132,240	515,736			
1/29		26,448	158,688		400	
2/ 2			33,060			
2/ 5		400	39,672			
2/ 8			11,200			
2/12	52,896	1,600	66,120			
2/15	105,792	8,000	39,672			
2/19	800	800	52,896		1,600	3,200
2/23	66,120	1,600	105,792			1,600
2/26	3,200		67,200			6,400
3/ 1	105,792	12,800	158,688			9,600
3/ 5			185,136			
3/ 8	3,200		158,688			1,600
3/12		105,792	608,304			
3/15	16,000		35,200			
3/19	6,400		211,584			3,200
3/23	3,200	6,400	238,032			
3/26			132,240			
3/29	1,600		79,344			3,200
4/ 2		6,400	22,400			
4/ 5	6,400	6,400	28,800			
4/ 9		9,600				
4/13	6,400		6,400			
4/16			105,792		3,200	
4/19			41,600			
4/23		6,400	54,400			
4/26		3,200	211,584			
4/30	3,200		19,200			
5/ 3		6,400	105,792			
5/ 7			25,600			
5/11			105,792			
5/14						
5/17			211,584			
5/21						
5/24			6,400			
5/27						
5/31						
6/ 3						
6/ 7						
6/11						
6/16						
6/18						
6/21						
6/25						
6/28						
7/ 3						
7/ 5						
7/ 9						
7/12						
7/16						
7/19						
7/23						
7/26						6,400
7/30				105,792		

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Prorodon sp.	Stentor coeruleus	Stentor niger	Tintinnidium fluviatile	Trachelius ovum	Trichodina pediculus
8/ 2						
8/ 6				3,200		
8/ 9						
8/13				6,400		
8/15				317,376		
8/20	3,200			3,200		
8/23				12,800		
8/27				3,200		
8/31				12,800		
9/ 2				6,400		
9/ 6				....		
9/ 9				264,480		
9/13				25,600		
9/17				211,584		
9/20						
9/24				6,400		
9/27				158,688		
10/ 1				211,584		
10/ 4				12,800	....	
10/ 8				6,400	....	....
10/11	....			158,688		
10/15	52,896	6,400		....		
10/18	....			6,400		
10/22	52,896			105,792		
10/26				....	....	....
10/29	6,400			158,688	....	....
11/ 1			6,400			
11/ 5	6,400					
11/ 8	12,800					
11/12			9,600			16,000
11/15						
11/19	52,896		6,400			9,600
11/22	6,400		3,200			3,200
11/26	12,800	6,400				
11/30	3,200		22,400			
12/ 3	132,240	19,200	19,200			
12/ 6	9,600	3,200	16,000	3,200		
12/10		2,400	800	800		
12/14	....	800	39,672			800
12/17	1,600	32,672	79,344			
12/20	33,060	165,300	158,688			
12/24		2,400	7,200			800
12/27		46,284	400			
12/31		66,120	39,672			

1913	Vorticella longifilum	Vorticella sp.	Total Ciliata	Acineta sp.	Podophrya sp.	Sphaerophrya sp.
1/ 5			7,412			
1/ 8			1,600			
1/12			4,000			
1/15			63,108			
1/19			132,040			
1/22			250,832			
1/26			899,632			
1/29			391,308			
2/ 2			53,484			
2/ 5			103,180			
2/ 8			85,272			
2/12			284,104			

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Vorticella longifilum	Vorticella sp.	Total Ciliata	Acineta sp.	Podophrya sp.	Sphaerophrya sp.
2/15	1,600		649,152			
2/19			272,856			
2/23			411,920			
2/26			484,720			
3/ 1			780,544			
3/ 5	3,200		302,128			
3/ 8			460,816			
3/12			1,538,782			
3/15	3,200		248,288			
3/19			893,584			
3/23		3,200	778,944			
3/26			345,424			
3/29			281,232			
4/ 2			399,728			
4/ 5			370,176			
4/ 9			364,624			
4/13		1,600	70,408			
4/16	79,344	1,600	387,272			
4/19	105,792		340,528			
4/23	1,600	1,600	278,784			
4/26		79,344	411,120			
4/30		528,960	766,144			
5/ 3	1,600	687,648	910,432			
5/ 7		396,720	554,560			
5/11	1,600	396,720	586,656			
5/14		1,533,984	1,639,776			
5/17		1,692,672	2,915,680			
5/21	3,200	740,544	849,536			
5/24		1,428,192	1,699,072			
5/27	6,400	1,163,712	1,170,112			
5/31		1,322,400	1,322,400			
6/ 3		1,428,192	1,428,192			
6/ 7		2,433,216	2,433,216			
6/11		1,745,568	1,904,256			
6/16		1,798,464	1,801,604			
6/18		2,591,904	2,595,104			
6/21		3,596,928	3,600,128			
6/25	12,800	1,851,360	1,873,360			
6/28		2,062,944	2,221,632			
7/ 3		1,692,672	1,702,272			
7/ 5		2,644,800	2,806,688			
7/ 9		476,064	687,648			
7/12		740,544	743,744			
7/16		1,110,816	1,116,216			
7/19		1,057,920	1,057,920			
7/23		476,064	476,064			
7/26		1,269,504	1,487,488			
7/30	6,400	899,232	1,117,216			
8/ 2		1,639,776	1,748,768			
8/ 6		634,752	743,744			
8/ 9		687,648	1,428,192			
8/13		2,168,736	2,968,576			
8/15		1,375,296	2,128,640			
8/20		1,586,880	1,804,864			
8/23		793,440	1,229,408			
8/27		740,544	1,011,624			
8/31		1,851,360	2,028,048			
9/ 2		899,232	1,216,208			
9/ 6		899,232	1,692,672	3,200		
9/ 9		634,752	1,110,816			

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Vorticella longifilum	Vorticella sp.	Total Ciliata	Acineta sp.	Podophrya sp.	Sphaerophrya sp.
9/13	......	952,128	1,242,208	......	......	......
9/17		1,005,024	1,222,008	......	......	......
9/20	......	423,168	793,440	......	......	......
9/24	52,896	581,856	1,064,320	......	......	......
9/27	52,896	317,376	793,440	......	......	......
10/1	......	1,322,400	1,851,360	......	......	......
10/4	......	687,648	912,032	......	......	......
10/8	6,400	528,960	1,024,224	......	......	......
10/11	......	528,960	1,005,024	......	......	......
10/15		687,648	852,736	......	6,400	......
10/18	......	423,168	694,048	......	......	......
10/22	52,896	1,692,672	2,274,528	......	......	......
10/26	211,584	634,752	899,242	......	......	......
10/29	105,792	1,481,088	2,095,744	......	......	......
11/1	......	317,376	895,840	......	......	......
11/5		158,688	360,480	......	......	......
11/8	......	......	318,296	......	......	......
11/12	......	290,928	1,646,080	......	......	......
11/15	......	......	315,680	6,400	......	......
11/19	79,344	211,584	839,088	......	......	52,896
11/22	9,600	211,584	419,872	......	......	......
11/26	6,400	79,344	242,736	......		......
11/30	158,688	79,344	559,360	......	......	......
12/3	52,896	52,896	470,320	......	......	3,200
12/6	22,400	105,792	209,792	......	3,200	......
12/10	39,672	13,224	113,792	800	800	800
12/14	125,628	72,732	470,618	......	......	......
12/17	13,224	26,448	447,992	......	800	......
12/20	46,284	39,672	721,108	......	......	......
12/24	52,896	19,836	141,392	......	800	......
12/27	52,896	33,060	297,328	......	......	......
12/31	85,956	52,896	350,436	......	......	......

1913	Total Suctoria	Total Protozoa without Mastigophora	Total Protozoa with Mastigophora	Collotheca egg, attached	Collotheca pelagica	Total Rhizota
1/5	......	20,636	20,636	......	......	......
1/8	......	1,600	2,000	......	......	......
1/12	......	4,800	5,600	......	......	......
1/15	......	63,108	1,042,084	......	......	......
1/19	......	132,440	1,133,652	......	......	......
1/22	......	251,232	352,012	......	......	......
1/26	......	899,632	1,172,324	......		......
1/29	......	391,308	685,836	......	......	......
2/2	......	53,484	82,732	......	......	......
2/5	......	103,980	277,492	......	......	......
2/8	......	85,272	623,032	......	......	......
2/12	......	284,104	537,760	......	......	......
2/15	......	650,752	972,928	......	......	......
2/19	......	282,456	1,844,016	......	......	......
2/23	......	412,720	802,616	......	......	......
2/26	......	484,720	1,239,664	......	......	......
3/1	......	785,344	1,279,008	......		......
3/5	......	302,128	391,072	......	......	......
3/8	......	460,816	521,712	......	......	......
3/12	......	1,538,782	1,599,678	......	......	......
3/15	......	251,488	432,576	......		......
3/19	......	895,184	952,880	......	......	......
3/23	......	780,544	894,336	......	......	......

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Total Suctoria	Total Protozoa without Mastigophora	Total Protozoa with Mastigophora	Collotheca egg, attached	Collotheca pelagica	Total Rhizota
3/26	...	384,624	702,048	...	...	...
3/29	...	286,032	768,400	...	...	...
4/ 2	...	452,624	612,912	...	...	
4/ 5	...	424,672	439,072	...	...	...
4/ 9	...	445,568	459,968			
4/13	...	138,104	150,904			
4/16	...	390,472	826,440	...	...	...
4/19	...	340,528	404,624			
4/23	...	442,272	1,662,080	...	...	
4/26	...	702,048	920,032	...	...	
4/30	...	1,005,776	1,141,216	...	...	
5/ 3	...	993,276	1,284,204			
5/ 7	...	769,344	822,240			
5/11	...	907,232	1,277,504			
5/14	...	1,854,560	1,966,752			
5/17	...	3,345,248	3,927,104			
5/21	...	2,280,928	2,502,112			
5/24	...	2,016,448	2,280,928	...	...	
5/27	...	2,125,440	2,657,600	...		
5/31	...	2,107,456	3,647,840			
6/ 3	...	2,962,176	3,709,120			
6/ 7	...	3,920,714	4,925,738			
6/11	...	3,074,368	4,185,184			
6/16	...	3,547,172	5,044,260			
6/18	...	2,915,680	4,419,168			
6/21	...	3,887,008	4,587,456			
6/25	...	4,306,576	5,753,968	...		
6/28	...	3,544,032	5,411,392	...	...	
7/ 3	...	2,601,504	5,542,784			
7/ 5	...	3,560,032	5,629,376			
7/ 9	...	1,804,864	4,821,440	...	...	...
7/12	...	905,632	7,100,864			
7/16	...	1,757,368	7,109,464	...		
7/19	...	1,434,592	8,476,160			
7/23	...	899,232	4,185,184	...		
7/26	...	2,125,440	10,324,320	...	...	...
7/30	...	1,535,488	5,779,968	...	...	...
8/ 2	...	3,547,232	8,379,968	...	...	...
8/ 6	...	1,114,016	6,102,240			
8/ 9	...	2,277,728	5,190,208			
8/13	...	5,666,262	14,152,012	...	...	...
8/15	...	3,398,144	10,178,432	...	6,400	6,400
8/20	...	2,284,128	12,757,536	...	...	...
8/23	...	2,987,776	11,880,704	...	6,400	6,400
8/27	...	1,235,808	9,755,264	...	...	...
8/31	...	2,980,176	14,299,920	...	...	...
9/ 2	...	1,430,992	16,634,544	12,800	6,400	19,200
9/ 6	3,200	1,705,472	18,529,600	...	...	...
9/ 9	...	1,226,208	23,872,096	...	...	
9/13	...	1,248,608	22,883,072	...	...	
9/17	...	1,289,688	22,502,200	...	...	
9/20	...	1,328,192	10,902,368	...	...	
9/24	...	1,434,592	8,899,328	...	...	
9/27	...	1,163,712	15,868,800	...	...	
10/ 1	...	2,168,736	14,546,400	...	...	
10/ 4	...	1,440,992	8,071,192	...	...	...
10/ 8	...	1,394,496	7,854,208	...	6,400	6,400
10/11	...	1,804,864	8,740,640	...	...	...
10/15	6,400	1,335,200	5,355,224	...	105,792	105,792

Table 1.—Organisms per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Total Suctoria	Total Protozoa without Mastigophora	Total Protozoa with Mastigophora	Collotheca egg, attached	Collotheca pelagica	Total Rhizota
10/18	...	1,223,008	7,676,320	...	...	...
10/22	...	4,020,096	9,838,656	6,400	6,400	12,800
10/26	...	2,591,914	7,617,034	...	...	...
10/29	...	3,377,436	10,636,988	...	...	...
11/ 1	...	1,753,750	9,806,752	...	...	...
11/ 5	...	5,339,104	10,946,080	...	...	...
11/ 8	...	1,746,488	8,119,608	...	...	...
11/12	...	5,565,184	19,430,336	...	...	...
11/15	6,400	2,279,232	9,644,576	...	...	...
11/19	52,896	1,718,272	7,386,144	...	...	...
11/22	...	424,672	6,239,184	...	...	...
11/26	...	297,232	2,841,040	...	...	...
11/30	...	957,680	4,274,880	...	...	...
12/ 3	3,200	478,320	3,258,560	...	...	...
12/ 6	3,200	267,488	2,340,032	...	...	...
12/10	2.400	116,992	1,141,852	...	...	...
12/14	...	471,018	1,690,826	...	...	...
12/17	800	449,192	1,878,584	...	...	...
12/20	...	721,508	1,469,628	...	...	...
12/24	800	143,392	1,283,856	...		...
12/27	...	298,128	1,647,776	...	...	...
12/31	...	350,436	1,389,720	...	...	...

1913	Rotaria neptunia	Rotaria rotatoria	Rotifer egg, winter	Rotifer egg, unidentified	Rotifer unidentified	Total Bdelloida
1/ 5	3,200	112,404	...	...	...	115,604
1/ 8	...	213,420	...	...	...	231,420
1/12	...	178,524	...	...	...	178,524
1/15	2,000	449,616	...	...	...	451,616
1/19	7,200	720,708	...	...	...	727,908
1/22	8,000	185,136	...	...	...	193,136
1/26	39,672	1,309,176	...	...	26,448	1,375,496
1/29	39,672	1,243,056	...	...	46,284	1,329,012
2/ 2	8,000	1,282,728	400	...	3,200	1,293,928
2/ 5	25,600	1,335,624	...	...	800	1,361,024
2/ 8	11,200	1,203,384	800	79,344	...	1,284,728
2/12	25,600	1,626,552	800	145,464	66,120	1,864,536
2/15	24,000	1,401,744	...	800	3,200	1,428,744
2/19	11,200	357,048	...	...	1,600	369,848
2/23	...	674,424	39,672	...	1,600	676,024
2/26	3,200	1,057,920	1,600	...	3,200	1,064,320
3/ 1	3,200	1,745,568	...	...	6,400	1,755,168
3/ 5	...	1,639,776	...	...	52,896	1,692,672
3/ 8	...	766,992	1,600	...	1,600	768,592
3/12	3,200	2,512,560	...	...	105,792	2,681,552
3/15	...	1,269,504	...	...	6,400	1,275,904
3/19	3,200	714,096	...	...	3,200	720,496
3/23	3,200	793,440	...	1,600	1,600	798,240
3/26		343,824	...	...	...	343,824
3/29	6,400	528,960	...	...	52,896	588,256
4/ 2	...	79,344	...	...	3,200	82,544
4/ 5	...	290,928	...	...	...	290,928
4/ 9	...	317,376	...	...	132,240	449,616
4/13	...	132,240	...	...	3,200	135,440
4/16	...	185,136	...	...	1,600	186,736
4/19	...	105,792	...	1,600	...	105,792
4/23	...	79,344	...	1,600	1,600	80,944
4/26	...	3,200	...	...	1,600	4,800

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Rotaria neptunia	Rotaria rotatoria	Rotifer egg, winter	Rotifer egg, unidentified	Rotifer unidentified	Total Bdelloida
4/30	...	79,344	...	...	79,344	158,688
5/ 3	...	79,344	...	...	158,688	238,032
5/ 7	...	105,792	...	...	1,600	107,392
5/11	...	1,600	...	...	...	1,600
5/14	...	6,400	...	6,400	6,400	12,800
5/17	...	370,272	6,400	...	211,584	581,856
5/21	...	3,200	...	...	264,480	267,680
5/24	...	25,600	...	...	264,480	290,080
5/27	...	6,400	...	...	...	6,400
5/31	...	6,400	...	...	6,400	12,800
6/ 3	...	6,400	...	...	3,200	9,600
6/ 7	...	...	...	...	6,400	6,400
6/11	...	...	...	...	3,200	3,200
6/16	...	...	...	...	12,800	12,800
6/18	...	19,200	...	...	3,200	22,400
6/21	...	19,200	...	...	6,400	25,600
6/25	...	158,688	...	3,200	6,400	165,088
6/28	...	423,168	...	...	...	423,168
7/ 3	6,400	158,688	...	...	...	165,088
7/ 5	...	19,200	...	...	158,688	177,888
7/ 9	...	6,400	...	...	3,200	9,600
7/12	...	211,584	...	...	3,200	214,784
7/16	...	19,200	...	...	19,200	38,400
7/19	...	...	...	...	158,688	158,688
7/23	...	317,376	...	...	...	317,376
7/26	...	12,800	...	...	26,500	38,400
7/30	6,400	6,400	...	...	3,200	16,000
8/ 2	6,400	32,000	19,200	...	3,200	41,600
8/ 6	6,400	32,000	3,200	...	211,584	249,984
8/ 9	6,400	370,272	264,480	...	...	376,672
8/13	...	105,792	...	...	317,376	105,792
8/15	57,600	153,600	...	...	317,376	528,576
8/20	25,600	237,184	...	...	158,688	262,784
8/23	12,800	16,000	...	...	6,400	35,200
8/27	32,000	105,792	...	...	158,688	296,480
8/31	...	...	...	...	105,792	105,792
9/ 2	...	...	...	...	3,200	3,200
9/ 6	...	6,400	...	...	105,792	112,192
9/ 9	...	...	3,200	...	3,200	3,200
9/13	...	12,800	...	...	105,792	118,592
9/17						
9/20	12,800	211,584	...	...	6,400	230,784
9/24	12,800	6,400	...	...	...	19,200
9/27						
10/ 1	...	52,896	...	...	...	52,896
10/ 4	25,600	6,400	...	...	...	32,000
10/ 8	6,400	12,800	6,400	...	211,584	230,784
10/11	6,400	...	...	...	105,792	112,192
10/15	158,688	65,696	...	...	211,584	435,968
10/18	38,400	19,200	...	...	...	57,600
10/22	12,800	105,792	...	...	264,480	389,472
10/26	19,200	19,200	6,400	...	52,896	91,296
10/29	19,200	25,600	...	...	211,584	256,384
11/ 1	76,800	211,584	...	...	105,792	394,176
11/ 5	158,688	158,688	...	...	...	317,376
11/ 8	105,792	105,792	...	...	...	211,584
11/12	105,792	79,344	...	...	...	186,136
11/15	6,400	105,792	6,400	...	...	112,192
11/19	19,200	317,376	3,200	...	52,896	489,472
11/22	12,800	132,240	6,400	...	52,896	207,936

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Rotaria neptunia	Rotaria rotatoria	Rotifer egg, winter	Rotifer egg, unidentified	Rotifer unidentified	Total Bdelloida
11/26	52,896	51,200	9,600			104,096
11/30	16,000	79,344	52,896		1,600	96,944
12/ 3	52,896	79,344				132,240
12/ 6	41,600	185,136	1,600			226,736
12/10	19,826	19,836				39,672
12/14	33,060	800	400			33,860
12/17	33,060	1,600	400			34,660
12/20	52,896	13,224	400			66,120
12/24	4,800		800			4,800
12/27	13,224	26,448				39,672
12/31	52,896	39,672	1,600		400	92,968

1913	Anuraeopsis egg, attached	Anuraeopsis fissa	Anuraeopsis sp.	Asplanchna brightwellii	Asplanchnopus sp.	Brachionus angularis
1/ 5						
1/ 8						
1/12						
1/15						
1/19						
1/22						
1/26						
1/29						
2/ 2						
2/ 5						
2/ 8						
2/12					1,600	
2/15					800	
2/19						
2/23						
2/26						
3/ 1						
3/ 5						6,400
3/ 8						
3/12						
3/15				16,000		
3/19				16,000		3,200
3/23				3,200		
3/26						1,600
3/29				9,600		
4/ 2				9,600		6,400
4/ 5				83,200	3,200	
4/ 9				132,240		
4/13				41,600		
4/16				41,600		
4/19				35,200		
4/23				16,000		3,200
4/26				41,600		12,800
4/30				9,600		132,240
5/ 3						185,136
5/ 7				12,800		264,480
5/11				44,800		978,576
5/14				12,800		1,428,192
5/17			264,480			1,057,920
5/21			423,168	25,600		370,272
5/24			158,688	12,800		423,168
5/27			3,200	51,200		179,200
5/31				12,800		581,856
6/ 3				19,200		476,064

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Anuraeopsis egg, attached	Anuraeopsis fissa	Anuraeopsis sp.	Asplanchna brightwellii	Asplanchnopus sp.	Brachionus angularis
6/ 7				44,800		158,688
6/11				32,000		370,272
6/16				19,200		264,480
6/18				6,400		19,200
6/21			6,400	6,400		
6/25				51,200		3,200
6/28				38,400		
7/ 3				83,200		12,800
7/ 5				158,688		3,200
7/ 9				19,200		
7/12				44,800		158,688
7/16				12,800		
7/19				6,400		
7/23		6,400		3,200		
7/26				19,200		
7/30				25,600		
8/ 2				44,800		
8/ 6						
8/ 9		6,400				3,200
8/13	6,400	38,400		38,400		
8/15		6,400		76,800		
8/20		12,800		25,600		
8/23		3,200		25,600		
8/27				32,000		
8/31		19,200		6,400		
9/ 2		6,400		12,800		
9/ 6						
9/ 9				6,400		
9/13		3,200		51,200		
9/17		6,400		3,200		
9/20						52,896
9/24	6,400	105,792				105,792
9/27						370,272
10/ 1	52,896	52,896				317,376
10/ 4		6,400				
10/ 8	6,400	19,200				52,896
10/11				6,400		
10/15		12,800		19,200		
10/18		105,792		6,400		
10/22	6,400	12,800		57,600		
10/26		6,400		12,800		
10/29	6,400	108,800		105,792		
11/ 1	6,400	158,688		6,400		
11/ 5						
11/ 8						
11/12						3,200
11/15		12,800				19,200
11/19	41,600	54,400				22,400
11/22	52,896	158,688				79,344
11/26		132,240				16,000
11/30		6,400				3,200
12/ 3		3,200				3,200
12/ 6						
12/10						
12/14						
12/17						
12/20						
12/24						
12/27						
12/31						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Brachionus angularis caudatus	Brachionus budapestenensis	Brachionus calyciflorus	Brachionus capsuliflorus	Brachionus egg, attached female	Brachionus egg, attached male
1/5	...	...	6,612	...	...	...
1/8	...	...	39,672	...	400	...
1/12	...	9,600	10,000	...	2,400	
1/15	...	...	13,224	...	1,200	8,400
1/19	...	...	13,224	...	800	5,200
1/22	...	...	800	...	4,800	...
1/26	...	...	19,836	...	19,836	...
1/29	...	...	59,508	...	1,600	...
2/2	...	...	33,060	...	33,060	39,672
2/5	...	...	52,896	...	85,956	79,344
2/8	...	...	171,912	...	79,344	52,896
2/12	...	...	224,808	...	224,808	105,792
2/15	...	...	9,600	...	...	6,400
2/19	...	...	66,120	...	39,672	...
2/23	...	...	211,584	...	304,152	...
2/26	...	...	396,720	...	528,960	16,000
3/1	...	...	317,376	...	290,928	12,800
3/5	...	...	1,295,952	...	1,375,296	317,376
3/8	...	...	1,110,816	...	714,096	79,344
3/12	...	...	3,914,304	...	608,304	476,064
3/15	...	...	132,240	...	92,800	48,000
3/19	...	...	264,480	...	105,792	...
3/23	...	...	449,616	...	132,240	32,000
3/26	...	...	343,824	...	317,376	32,000
3/29	...	...	264,480	1,600	290,928	...
4/2	...	...	714,096	...	185,136	290,928
4/5	...	...	317,376	...	3,200	...
4/9	...	...	16,000	...	...	...
4/13	...	...	19,200	...	12,800	...
4/16	...	...	79,344	...	52,896	...
4/19	...	...	38,400	...	9,600	...
4/23	...	...	44,800	...	12,800	52,896
4/26	...	...	57,600	...	9,600	...
4/30	...	...	25,600	...	61,600	...
5/3	12,800	...	105,792	...	79,344	...
5/7	...	...	185,136	6,400	502,512	...
5/11	...	...	79,344	...	238,032	...
5/14	...	...	140,800	12,800	370,272	6,400
5/17	...	...	102,400	6,400	423,168	...
5/21	12,800	...	44,800	...	211,584	...
5/24	12,800	...	6,400	...	317,376	...
5/27	25,600	...	...	...	423,168	44,800
5/31	211,584	...	...	...	211,584	...
6/3	581,856	...	...	...	899,232	3,200
6/7	952,128	...	...	...	476,064	...
6/11	370,272	...	...	6,400	288,000	...
6/16	317,376	...	...	...	952,128	147,200
6/18	899,232	...	...	...	370,272	...
6/21	1,110,816	...	...	...	793,440	12,800
6/25	2,591,904	...	...	6,400	846,336	317,376
6/28	1,269,504	...	...	6,400	528,960	...
7/3	687,648	...	...	...	158,688	...
7/5	476,069	...	...	...	158,688	...
7/9	1,163,712	...	3,200	...	687,648	...
7/12	1,375,296	...	...	...	528,960	...
7/16	793,440	...	...	...	846,336	...
7/19	793,440	...	...	...	476,064	...
7/23	317,376	...	...	6,400	158,688	...
7/26	1,481,088	...	6,400	...	370,272	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Brachionus angularis caudatus	Brachionus budapestenensis	Brachionus calyciflorus	Brachionus capsuliflorus	Brachionus egg, attached female	Brachionus egg, attached male
7/30	423,168			6,400	12,800	
8/ 2	211,584				2,644,480	
8/ 6	105,792				3,200	
8/ 9	105,792				158,688	105,792
8/13	1,269,504				317,376	
8/15	1,428,192			6,400	687,648	
8/20	1,692,672			6,400	952,128	
8/23	899,232				740,544	
8/27	952,128				476,064	
8/31	317,376				105,792	
9/ 2	476,064			6,400	158,688	
9/ 6	476,064				317,376	105,792
9/ 9	2,433,216			3,200	1,269,504	19,200
9/13	2,062,944			3,200	476,064	
9/17	687,648		6,400		370,272	
9/20	19,200				6,400	
9/24	264,480		12,800		105,792	
9/27	740,544				1,005,024	
10/ 1	581,856	19,200		12,800	370,272	
10/ 4	581,856	6,400	6,400	6,400	423,168	
10/ 8	793,440			32,000	634,752	52,896
10/11	423,168	52,896	6,400	6,400	158,688	
10/15	264,480			6,400	158,688	19,200
10/18	158,688	6,400		32,000	52,896	
10/22	370,272		6,400		211,584	211,584
10/26	19,200					
10/29	25,600	6,400		6,400	6,400	
11/ 1				6,400		
11/ 5	6,400		6,400			
11/ 8						
11/12			3,200		9,600	9,600
11/15			6,400		12,800	12,800
11/19			3,200		19,200	
11/22			3,200		105,792	
11/26			9,600		79,344	
11/30					16,000	
12/ 3					9,600	
12/ 6						
12/10					1,600	
12/14					800	
12/17						
12/20			800			
12/24					1,600	
12/27						
12/31						

1913	Brachionus egg, free female	Brachionus egg, free male	Brachionus male	Brachionus plicatilis	Brachionus urceus	Brachionus with endoparasites
1/ 5	13,224			1,600	6,612	
1/ 8	33,060			2,000	400	
1/12	6,400			5,200	800	
1/15	26,448			13,224	400	
1/19	13,224			26,448		
1/22	400			4,800	1,600	
1/26				26,448	400	
1/29	19,836			52,896	17,600	
2/ 2	13,224			92,568	59,508	
2/ 5	92,568			99,180	52,896	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Brachionus egg, free female	Brachionus egg, free male	Brachionus male	Brachionus plicatilis	Brachionus urceus	Brachionus with endoparasites
2/ 8	119,016	...	...	79,344	52,896	...
2/12	39,672	...	...	132,240	105,792	...
2/15	...	...	...	1,600	3,200	...
2/19	92,568	...	...	3,200	...	...
2/23	171,912	800	...	17,600	800	...
2/26	105,792	1,600	...	16,000	79,344	...
3/ 1	52,896	...	...	25,600	...	...
3/ 5	211,584	79,344	...	132,240	6,400	...
3/ 8	52,896	...	...	12,800	...	...
3/12	476,064	1,600	1,600	38,400	...	...
3/15	...	...	6,400	19,200	...	
3/19	158,688	1,600	...	12,800	...	
3/23	185,136	...	...	6,400	...	...
3/26	264,480	...	...	22,400	3,200	...
3/29	211,584	...	...	25,600	3,200	...
4/ 2	132,240			9,600		
4/ 5	52,896	...	...	19,200	...	...
4/ 9	1,600			...	3,200	...
4/13				3,200	...	...
4/16						...
4/19	1,600	...	...	...	...	...
4/23	3,200	...	...	...	...	...
4/26	1,600	...	...	3,200	...	...
4/30	1,600	...	...	...	...	...
5/ 3	...	...	...	...	3,200	...
5/ 7	...	...	...	1,600	...	...
5/11	423,168	...	...	...	...	...
5/14	423,168		...	...	25,600	...
5/17	1,005,024	...		...	32,000	...
5/21	211,584				158,688	...
5/24	211,584	...	...		128,000	...
5/27	211,584			12,800	423,168	
5/31	317,376				370,272	
6/ 3	158,688	...	211,584	...	899,232	
6/ 7	211,584	...	3,200	...	740,544	...
6/11	317,376	...	...	...	505,600	...
6/16	370,272	...	...	...	423,168	...
6/18	317,376	...	...	...	687,648	...
6/21	317,376	...	...	3,200	899,232	...
6/25	581,856	...	...	...	581,856	528,960
6/28	687,648	...	...	6,400	128,000	...
7/ 3	264,480	...	...	...	51,200	...
7/ 5	1,005,024	...	...	6,400	44,800	...
7/ 9	899,232	...	...	...	44,800	...
7/12	1,005,024	...	...	...	528,960	...
7/16	370,272	...	...	...	528,960	...
7/19	264,480	...	...	...	370,272	...
7/23	740,544	...	...	...	6,400	
7/26	476,064	...	...	...	423,168	...
7/30	423,168	...	...	...	105,792	12,800
8/ 2	423,168	...	...	...	370,272	3,200
8/ 6	634,752	...	...	...	264,480	6,400
8/ 9	1,163,712	...	...	6,400	793,440	...
8/13	1,110,816	...	105,792	...	793,440	...
8/15	899,232	...	...	...	264,480	
8/20	2,486,112	...	...	...	476,064	...
8/23	634,752	...	...	...	581,856	...
8/27	1,005,024	...	...	...	370,272	
8/31	687,648	...	...	...	105,792	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Brachionus egg, free female	Brachionus egg, free male	Brachionus male	Brachionus plicatilis	Brachionus urceus	Brachionus with endoparasites
9/ 2	634,752				96,000	
9/ 6	846,336				105,792	
9/ 9	793,440				211,584	
9/13	1,057,920				211,584	
9/17	370,272				12,800	
9/20	687,648				19,200	
9/24	476,064				121,600	
9/27	370,272				264,480	
10/ 1	370,272				158,688	
10/ 4	952,128				105,792	
10/ 8	793,440				158,688	6,400
10/11	952,128				105,792	
10/15	634,752				211,584	
10/18	952,128				44,800	
10/22	528,960				32,000	
10/26	264,480			6,400	6,400	
10/29	317,376				12,800	
11/ 1	105,792			6,400		
11/ 5	105,792					
11/ 8	158,688					
11/12	52,896					
11/15					52,896	
11/19	238,032				3,200	
11/22	370,272				9,600	
11/26	132,240				1,600	
11/30	449,616				6,400	
12/ 3	449,616				3,200	
12/ 6	158,688				3,200	
12/10	46,284				800	
12/14	119,016				1,600	
12/17	33,060					
12/20	66,120					
12/24	26,448				800	
12/27	72,732					
12/31	105,792					

1913	Diurella egg, free	Diurella tenuior	Epiphanes clavulata	Filinia brachiata	Filinia egg, attached female	Filinia egg, attached male
1/ 5						
1/ 8						
1/12						
1/15						
1/19						
1/22						
1/26						
1/29						
2/ 2					400	2,400
2/ 5						
2/ 8						
2/12					92,568	
2/15					26,448	
2/19					158,688	
2/23					581,856	277,704
2/26					555,408	79,344
3/ 1					105,792	132,240
3/ 5					1,481,088	502,512
3/ 8					423,168	238,032
3/12					1,190,160	105,792

Table 1.—Organisms Per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Diurella egg, free	Diurella tenuior	Epiphanes clavulata	Filinia brachiata	Filinia egg, attached female	Filinia egg, attached male
3/15		3,200			132,240	
3/19	......	......	......	......	185,136	158,688
3/23	......	......	......	......	117,376	......
3/26	......	......	......	......	132,240	
3/29	......	......	......	......	476,064	52,896
4/ 2	......	......	......	......	132,240	......
4/ 5	......	......	......	......	52,896	......
4/ 9	......	......	......	......	1,600	..
4/13	......	......	......	1,600	185,136	......
4/16	......	......	......	......	79,344	......
4/19	......	......	......	......	1,600	......
4/23	......	......	......	......	158,688	......
4/26	......	3,200	......	......	317,376	132,240
4/30						
5/ 3	......	......	......	......	158,688	211,584
5/ 7	......	......	......	......	502,512	185,136
5/11	......	......	......	......	158,688	105,792
5/14	......	......	......	......	211,584	......
5/17	......	......	......	......	105,792	
5/21				12,800		
5/24				6,400		
5/27	105,792	......	......	3,200	3,200	......
5/31	105,792	......	......	......	......	......
6/ 3	......	......	......	......	105,792	......
6/ 7				6,400		
6/11						
6/16	3,200					
6/18	3,200	......	......	......	6,400	......
6/21						
6/25	......	......	......	......	3,200	......
6/28	......	......	......	6,400	211,584	317,376
7/ 3	......	......	......	......	3,200	......
7/ 5	......	......	......	3,200	158,688	......
7/ 9	3,200	......	......	......	3,200	......
7/12	......	......	......	......	......	......
7/16						
7/19					6,400	
7/23						
7/26						
7/30						
8/ 2	105,792					
8/ 6						
8/ 9						
8/13						
8/15						
8/20			6,400			
8/23			6,400			
8/27						
8/31						
9/ 2						
9/ 6						
9/ 9						
9/13						
9/17						
9/20						
9/24			6,400			
9/27						
10/ 1						
10/ 4			6,400			
10/ 8						

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Diurella egg, free	Diurella tenuior	Epiphanes clavulata	Filinia brachiata	Filinia egg, attached female	Filinia egg, attached male
10/11	....					
10/15	52,896	....	105,792			
10/18	52,896	....	....			
10/22						
10/26						
10/29						
11/ 1						
11/ 5						
11/ 8						
11/12						
11/15	....	....	....	....	....	....
11/19	....	....	....	105,792	1,600	....
11/22	....	....	....	105,792	....	79,344
11/26	....	....	....	52,896	1,600	....
11/30	....	....	....	1,600		
12/ 3	....	....	....	....		
12/ 6						
12/10						
12/14						
12/17						
12/20						
12/24						
12/27	....	....	....	....	....	....
12/31						

1913	Filinia egg, free	Filinia longiseta	Keratella cochlearis	Keratella egg, attached	Keratella egg, free	Keratella male
1/ 5	....	72,732	....	....	72,732	....
1/ 8	....	20,800	....	400	79,344	
1/12	....	5,600	400	6,000	25,200	
1/15	....	26,448	13,224	26,448	99,180	
1/19	....	2,400	400	26,448	46,284	
1/22	....	1,600	33,060	19,836	39,672	
1/26	....	800	....	72,732	138,852	
1/29	....	46,284	800	112,404	125,628	
2/ 2	....	4,800	13,224	33,060	171,912	
2/ 5	....	13,600	800	39,672	145,464	
2/ 8	....	66,120	800	171,912	343,824	
2/12	....	304,152	52,896	436,392	899,232	....
2/15	....	19,200	9,600	3,200	800	
2/19	....	383,496	14,400	6,400	132,240	
2/23	105,792	2,062,944	39,672	52,896	198,360	
2/26	132,240	1,401,744	79,344	79,344	449,616	
3/ 1	238,032	555,408	79,344	9,600	....	
3/ 5	1,904,256	3,702,720	158,688	1,600	79,344	
3/ 8	793,440	6,083,040	105,792	158,688	1,600	
3/12	899,232	5,025,120	105,792	1,600		
3/15	290,928	1,110,816	28,800	1,600	1,600	
3/19	449,616	1,586,880	343,824	290,928	1,600	
3/23	211,584	978,576	211,584	211,584	79,344	
3/26	52,896	608,304	238,032	423,168	396,720	
3/29	52,896	608,304	158,688	555,408	740,544	
4/ 2	....	238,032	370,272	132,240	2,089,392	
4/ 5	....	238,032	132,240	1,454,640	872,784	
4/ 9	....	132,240	238,032	608,304	2,115,840	
4/13	....	476,064	48,000	502,512	2,115,840	
4/16	....	185,136	6,400	264,480	2,062,944	
4/19	....	264,480	211,584	925,680	1,295,952	
4/23	....	290,928	290,928	423,168	1,005,024	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Filinia egg, free	Filinia longiseta	Keratella cochlearis	Keratella egg, attached	Keratella egg, free	Keratella male
4/26	608,304	581,856	211,584	423,168	1,930,704	
4/30	899,232	264,480	....	476,064	1,533,984	
5/3	819,888	370,272	1,600	502,512	1,243,056	
5/7	819,888	1,930,704	105,792	1,005,024	2,036,496	
5/11	502,512	925,128	52,896	819,888	793,440	
5/14	105,792	1,639,776		370,272	476,064	
5/17	211,584	1,057,920	3,200	3,200	317,376	
5/21	581,856	158,688		158,688	476,064	
5/24	370,272	6,400			476,064	
5/27		158,688	6,400	105,792	211,584	
5/31		25,600		3,200	476,064	
6/3		211,584	3,200	634,752	1,322,400	
6/7		51,200	6,400	105,792	370,272	
6/11	....	6,400	3,200	105,792	3,200	
6/16	105,792	38,400	19,200	158,688	264,480	
6/18	3,200	51,200	158,688	476,064	528,960	
6/21	158,688	211,584	6,400	211,584	1,586,880	
6/25	3,200	423,168	211,584	1,533,984	1,533,984	158,688
6/28	105,792	1,110,816	317,376	1,957,152	1,481,088	
7/3	158,688	264,480	264,480	317,376	3,200	
7/5	370,272	1,375,296	793,440	211,584	476,064	
7/9	476,064	12,800	211,584	3,200	211,584	
7/12	370,272	105,792	423,168	3,200	687,648	
7/16	....	25,600	12,800	105,792	....	
7/19	105,792	6,400	32,000	211,584	105,792	
7/23	105,792		38,400	211,584		
7/26	211,584		6,400	264,480		3,200
7/30	158,688		12,800	105,792	3,200	
8/2				158,688	105,792	
8/6	3,200			3,200	....	
8/9	264,480			105,792	264,480	
8/13	423,168			105,792	3,200	
8/15	370,272			3,200	3,200	
8/20	476,064				3,200	
8/23	158,688			317,376		
8/27	158,688			3,200		
8/31	264,480			3,200		
9/2	105,792			12,800		
9/6	3,200			105,792	3,200	
9/9	3,200			3,200		
9/13	3,200			423,168		
9/17			6,400	3,200		
9/20				12,800		
9/24	52,896			52,896		
9/27	52,896			370,272		
10/1	52,896		6,400	634,752		
10/4	105,792			793,440		
10/8				1,798,464		
10/11	....			1,216,608		
10/15	211,584		52,896	1,216,608		
10/18	52,896		158,688	423,168		
10/22	52,896		264,480	634,752	370,272	
10/26	....		528,960	423,168	158,688	
10/29	158,688		423,168	476,064	158,688	
11/1	211,584		105,792	6,400	105,792	
11/5			211,584	6,400		
11/8			89,600	25,600	....	
11/12	....		132,240	52,896	79,344	
11/15	105,792		51,200	12,800	581,856	
11/19	132,240		52,896	28,800	714,096	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Filinia egg, free	Filinia longiseta	Keratella cochlearis	Keratella egg, attached	Keratella egg, free	Keratella male
11/22	185,136		48,000	22,400	423,168	
11/26	....		51,200	28,800	79,344	
11/30	105,792		52,896	19,200	105,792	
12/ 3	52,896	1,600	57,600	52,896	52,896	
12/ 6			3,200	52,896	52,896	
12/10			1,600	6,400		
12/14	19,836		800	72,732	46,284	
12/17			1,600	4,000	1,600	
12/20				46,284	19,836	
12/24		1,600		13,224	19,836	
12/27			1,600	26,448	39,672	
12/31				66,120	79,344	

1913	Keratella quadrata	Lecane luna	Notholca striata	Notommata aurita	Polyarthra trigla	Polyarthra trigla egg, attached female
1/ 5	26,448					
1/ 8	92,568					
1/12	79,344				1,200	
1/15	152,076			....	39,672	
1/19	85,956		400	400	800	
1/22	39,672		800		800	
1/26	231,420				19,836	
1/29	323,928				66,120	
2/ 2	198,360				1,600	
2/ 5	125,628				19,836	
2/ 8	423,168				105,792	
2/12	1,124,040				39,672	
2/15	11,200				4,800	
2/19	79,344				14,400	
2/23	251,256	1,600			105,792	
2/26	132,240			....	28,800	3,200
3/ 1	16,000			6,400	79,344	
3/ 5	41,600	1,600			370,272	
3/ 8	925,680				581,856	
3/12	317,376				158,688	....
3/15	343,824		3,200		238,032	3,200
3/19	952,128				132,240	
3/23	740,544		3,200		25,600	....
3/26	1,084,368				79,344	52,896
3/29	2,142,288				105,792	1,600
4/ 2	3,385,344				158,688	
4/ 5	4,205,232				396,720	52,896
4/ 9	3,041,520				1,110,816	158,688
4/13	925,680				1,560,432	290,928
4/16	1,719,120		3,200		766,992	1,600
4/19	4,205,232				1,772,016	555,408
4/23	2,195,184				370,272	158,688
4/26	2,459,664				2,644,800	132,240
4/30	2,010,048				2,062,944	528,960
5/ 3	1,613,328				1,216,608	238,032
5/ 7	3,067,968				3,147,312	105,792
5/11	5,104,464				2,724,144	185,136
5/14	2,909,280				528,960	
5/17	1,005,024				264,480	
5/21	1,322,400				57,600	
5/24	317,376				38,400	
5/27	740,544				19,200	
5/31	846,336				19,200	
6/ 3	1,533,984				105,792	

Table 1.—Organisms per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Keratella quadrata	Lecane luna	Notholca striata	Notommata aurita	Polyarthra trigla	Polyarthra trigla egg, attached female
6/7	846,336				6,400	
6/11	528,960	....			19,200	
6/16	317,376	6,400			51,200	
6/18	740,544				317,376	
6/21	1,798,464				476,064	
6/25	6,030,144				1,005,024	
6/28	7,035,168				687,648	
7/3	1,798,464				19,200	
7/5	1,163,712				158,688	
7/9	264,480				899,232	3,200
7/12	1,322,400				1,692,672	3,200
7/16	952,128				687,648	
7/19	846,336				158,688	
7/23	1,692,672				134,400	
7/26	2,062,944				634,752	
7/30	2,010,048				952,128	....
8/2	1,110,816				793,440	3,200
8/6	687,648				687,648	
8/9	740,544				2,327,424	
8/13	899,232				952,128	
8/15	423,168				1,057,920	
8/20	1,163,712				1,904,256	
8/23	1,904,256		6,400		1,428,192	....
8/27	528,960				952,128	12,800
8/31	581,856				581,856	....
9/2	158,688				952,128	3,200
9/6	317,376				264,480	....
9/9	899,232				846,336	105,792
9/13	1,957,152				1,057,920	105,792
9/17	1,005,024				264,480	
9/20	89,600				899,232	
9/24	846,336				581,856	52,896
9/27	1,322,400				740,544	52,896
10/1	1,533,984				476,064	
10/4	2,062,944				581,856	....
10/8	5,395,392				634,752	52,896
10/11	4,866,432				634,752	105,792
10/15	3,914,304				634,752	
10/18	2,010,048				740,544	
10/22	2,697,696				423,168	
10/26	952,128				44,800	
10/29	1,269,504				32,000	
11/1	581,856				158,688	
11/5	64,000				....	
11/8	19,200				52,896	
11/12						
11/15	12,800				6,400	19,200
11/19	25,600				476,064	264,480
11/22	12,800				158,688	19,200
11/26	25,600				185,136	108,800
11/30	38,400				528,960	132,240
12/3	79,344				264,480	28,800
12/6	35,200				449,616	52,896
12/10	33,060				46,284	1,600
12/14	132,240				495,900	66,120
12/17	33,060				66,120	13,224
12/20	92,568				66,120	13,224
12/24	46,284				5,600	
12/27	85,956	400			46,284	800
12/31	125,628				132,240	1,600

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Polyarthra trigla egg, attached male	Synchaeta sp.	Trichocerca capucina	Trichocerca iernis	Total Ploima	Total Ploima without eggs
1/ 5					199,960	114,004
1/ 8					268,644	155,440
1/12					142,544	102,544
1/15					419,944	258,268
1/19					221,984	130,028
1/22		800			148,640	83,932
1/26					530,960	301,540
1/29		800			827,464	567,996
2/ 2					696,848	403,120
2/ 5					807,840	364,836
2/ 8					1,667,024	900,032
2/12					3,783,664	1,985,200
2/15					96,848	60,000
2/19					990,528	560,960
2/23		1,600			4,386,320	2,692,848
2/26		3,200			4,058,896	2,107,392
3/ 1		3,200			1,924,960	1,082,672
3/ 5		6,400			11,674,672	5,722,272
3/ 8					11,317,848	8,856,584
3/12		6,400			13,336,096	9,577,280
3/15		6,400			2,468,480	1,898,112
3/19					4,663,600	3,311,552
3/23					3,587,984	2,618,720
3/26		9,600			4,062,448	2,390,672
3/29		16,000			5,717,472	2,525,552
4/ 2		6,400			7,860,608	4,898,432
4/ 5		3,200			7,887,712	5,398,400
4/ 9		52,896			7,612,976	4,726,944
4/13					6,182,992	3,075,776
4/16					5,263,056	2,801,792
4/19					9,316,752	6,526,912
4/23					5,025,776	3,211,312
4/26		1,600			9,573,136	6,017,904
4/30		3,200			8,009,552	4,508,062
5/ 3		6,400			6,757,440	3,504,336
5/ 7		52,896			13,932,448	8,775,088
5/11		1,600			13,163,008	9,936,352
5/14					8,664,960	6,701,408
5/17		44,800			5,911,168	3,845,024
5/21		317,376			5,143,968	3,504,192
5/24		70,400			2,556,128	1,180,832
5/27		44,800		12,800	2,786,620	1,786,492
5/31		12,800			3,194,464	2,186,240
6/ 3		317,376			7,483,936	4,359,872
6/ 7		32,000	6,400		4,018,208	2,854,496
6/11					2,556,672	1,842,304
6/16		3,200			3,464,960	1,466,400
6/18		211,584			4,797,336	3,085,064
6/21		317,376			7,916,704	4,835,936
6/25		2,644,800	6,400		18,537,504	13,717,568
6/28		1,745,568	6,400		17,647,680	12,358,080
7/ 3		32,000		6,400	4,125,504	3,219,872
7/ 5		528,960		19,200	7,111,968	4,731,648
7/ 9		12,800		211,584	5,127,720	2,843,592
7/12		3,200		317,376	8,578,056	5,979,752
7/16		6,400		6,400	4,348,576	3,026,176
7/19				6,400	3,390,048	2,219,936
7/23		6,400			3,428,256	2,208,448
7/26				12,800	5,972,352	4,649,952
7/30				19,200	4,255,784	3,552,136
8/ 2				19,200	3,639,032	2,683,704

Table 1.—Organisms per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Polyarthra trigla egg, attached male	Synchaeta sp.	Trichocerca capucina	Trichocerca iernis	Total Ploima	Total Ploima without eggs
8/ 6		...	...	158,688	2,551,808	1,907,456
8/ 9		12,800	...	105,792	6,029,196	3,966,252
8/13	...	...	...	19,200	6,082,848	4,116,096
8/15	...	...	...	105,792	5,332,704	3,369,152
8/20	...	...	...	...	9,205,408	5,287,904
8/23		6,400	...	3,200	6,716,096	4,864,736
8/27	...	...	...	...	4,491,296	2,835,520
8/31		6,400	...	12,800	2,686,400	1,625,280
9/ 2	.	...	...	6,400	2,630,112	1,714,880
9/ 6		6,400	...	...	2,551,808	1,170,112
9/ 9		..	...	...	6,597,504	4,403,168
9/13			.	6,400	7,419,744	5,353,600
9/17				...	2,736,096	1,992,352
9/20			...	...	1,786,976	1,080,128
9/24			...	19,200	2,812,200	2,065,256
9/27		...	...	52,896	5,342,496	3,491,136
10/ 1		52,896	...	6,400	4,699,648	3,218,560
10/ 4		...	...	105,792	5,744,868	3,470,340
10/ 8			6,400	6,400	10,444,416	7,105,568
10/11	...	...	...	12,800	8,548,256	6,115,040
10/15	...	19,200	...	52,896	7,588,032	5,347,200
10/18	...	158,688	...	...	4,956,032	3,474,944
10/22	...	105,792	...	...	5,980,266	3,963,818
10/26	...	6,400	...	...	2,436,224	1,589,888
10/29	...	44,800	...	52,896	3,209,776	2,086,160
11/ 1	...	...	...	...	1,460,192	1,024,224
11/ 5	...	...	...	...	400,576	288,384
11/ 8	...	6,400	...	...	352,384	168,096
11/12	...	105,792	...	3,200	451,968	247,632
11/15	...	105,792	...	...	1,018,136	272,888
11/19	...	52,896	...	...	2,242,896	802,848
11/22	...	132,240	...	...	1,972,960	714,752
11/26	28,800	12,800	...	...	955,600	496,672
11/30	6,400	79,344	...	...	1,618,336	783,296
12/ 3	...	79,344	...	...	1,121,872	475,168
12/ 6	...	52,896	...	...	853,088	535,712
12/10	...	33,060	...	...	171,088	114,804
12/14	400	92,568	...	...	1,048,696	723,508
12/17	...	39,672	...	...	192,736	140,852
12/20	...	79,344	...	...	384,696	239,232
12/24	...	39,672	...	...	155,864	94,756
12/27	...	33,060	...	...	306,952	167,300
12/31	...	79,344	...	...	592,868	340,012

1913	Total Rotifera	Bosmina longirostris	Bosmina sp.	Sida sp.	Total Cladocera	Canthocamptus sp.
1/ 5	315,564	...	...	...	...	...
1/ 8	500,064	...	...	...	...	...
1/12	321,068	...	...	400	400	...
1/15	871,560	...	...	...	...	...
1/19	949,892	...	...	...	...	...
1/22	341,776	...	...	...	...	...
1/26	1,906,456	...	...	...	...	...
1/29	2,156,476	...	...	...	...	...
2/ 2	1,990,776	...	...	...	800	...
2/ 5	2,168,864	...	...	...	...	...
2/ 8	2,951,752	...	...	...	...	...
2/12	5,648,200	...	...	...	...	...
2/15	1,525,692	...	...	...	...	...
2/19	1,360,476	...	...	...	...	...
2/23	5,062,344	...	...	...	...	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Total Rotifera	Bosmina longirostris	Bosmina sp.	Sida sp.	Total Cladocera	Canthocamptus sp.
2/26	5,123,216	....				
3/ 1	3,680,128					
3/ 5	13,367,344					
3/ 8	12,086,440					
3/12	16,017,648					
3/15	3,744,384				3,200	
3/19	5,384,096					
3/23	4,386,224	....	....	....	....	3,200
3/26	4,406,272	....	....	....	....	....
3/29	6,305,728	....	....			
4/ 2	7,943,152					
4/ 5	8,178,640	....	....	....	....	3,200
4/ 9	8,062,592					
4/13	6,318,432					
4/16	5,449,792					
4/19	9,422,544					
4/23	5,106,720					
4/26	9,577,936					
4/30	8,168,240					
5/ 3	6,995,472	....				
5/ 7	14,039,840					
5/11	13,164,608					
5/14	8,677,760					
5/17	6,493,024	....	3,200	....	3,200	
5/21	5,411,648					
5/24	2,846,208	....	6,400	....	6,400	
5/27	2,793,020	....	....	....	....	
5/31	3,207,264	....	....	....	....	
6/ 3	7,493,536	....	....	6,400	6,400	
6/ 7	4,024,608	....	....	6,400	6,400	....
6/11	2,559,872	....	....	6,400	6,400	
6/16	3,477,760	....	....	....	....	
6/18	4,819,736					
6/21	7,942,304	....	....	6,400	6,400	
6/25	18,702,592	....	....	6,400	6,400	
6/28	18,070,648	....	....	....	....	
7/ 3	4,290,592					
7/ 5	7,289,856	....	....	6,400	6,400	
7/ 9	5,137,320					
7/12	8,792,840	....	....	6,400	6,400	
7/16	4,386,976	....	....	....	....	
7/19	3,548,736	....	....	12,800	12,800	
7/23	3,745,632					
7/26	6,010,752	....	....	6,400	6,400	....
7/30	4,271,784	6,400	....	....	6,400	....
8/ 2	3,680,632	6,400	....	6,400	12,800	
8/ 6	2,801,792					
8/ 9	6,405,868	....	....	6,400	6,400	
8/13	6,188,640	....	....	....	....	
8/15	5,867,680					
8/20	9,467,192	3,200	....	....	3,200	....
8/23	6,757,696	....	....	19,200	19,200	
8/27	4,787,776	....	....	6,400	6,400	
8/31	2,792,192	....	....	6,400	6,400	
9/ 2	2,652,512	....	....	25,600	25,600	
9/ 6	2,644,000	....	....	....	....	
9/ 9	6,600,704	6,400	....	6,400	12,800	
9/13	7,638,336	....	....	....	....	
9/17	2,736,096	6,400	....	12,800	19,200	
9/20	2,017,760	....	....	....	....	
9/24	2,831,400	6,400	....	12,800	19,200	

Table 1.—Organisms Per Cubic Meter in Plankton of Stockton Channel in 1913—(*Continued*)

1913	Total Rotifera	Bosmina longirostris	Bosmina sp.	Sida sp.	Total Cladocera	Canthocamptus sp.
9/27	5,342,496	……	……	12,800	12,800	
10/1	4,752,544	19,200	……	105,792	124,992	
10/4	5,776,868	6,400	……	6,400	12,800	
10/8	10,681,600	12,800			12,800	
10/11	8,660,448					
10/15	8,129,792					
10/18	5,013,632			6,400	6,400	
10/22	6,382,538			6,400	6,400	
10/26	2,527,520					
10/29	3,466,160					
11/1	1,854,368					
11/5	717,952					
11/8	563,968					
11/12	641,304					
11/15	1,130,328	……				
11/19	2,732,368	3,200			3,200	
11/22	2,180,896	……	……	……		
11/26	1,059,696	……	……	3,200	3,200	
11/30	1,715,280					
12/3	1,254,112					
12/6	1,079,824					
12/10	210,760					
12/14	1,082,556					
12/17	227,396					
12/20	450,816	800			800	
12/24	160,664					
12/27	346,624					
12/31	685,836					

1913	Cyclops sp.	Diaptomus sp.	Nauplius sp.	Total Copepoda	Total Entomostraca	Glochidia
1/5	6,612	……	800	7,412	7,412	
1/8	……		1,600	1,600	1,600	
1/12	800		2,400	3,200	3,600	
1/15	2,400	……	1,200	3,600	3,600	
1/19	2,000			2,000	2,000	
1/22		……	……	……		
1/26	1,600	……	……	1,600	1,600	
1/29	1,600	……	800	2,400	2,400	
2/2	2,400		2,400	4,800	5,600	
2/5	1,600		800	2,400	2,400	
2/8	1,600		2,400	4,000	4,000	
2/12	1,600		1,600	3,200	3,200	
2/15						
2/19	……			……		
2/23	1,600			1,600	1,600	
2/26	……					
3/1	3,200			3,200	3,200	
3/5	3,200			3,200	3,200	
3/8						
3/12						
3/15	6,400		6,400	12,800	16,000	
3/19	3,200		12,800	16,000	16,000	
3/23	9,600		12,800	25,600	25,600	
3/26	19,200		16,000	35,200	35,200	
3/29	9,600			9,600	9,600	
4/2	3,200	3,200	9,600	16,000	16,000	
4/5	12,800	9,600	32,000	57,600	57,600	
4/9	12,800	1,600	105,792	120,192	120,192	
4/13	9,600	12,800	105,792	128,192	128,192	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cyclops sp.	Diaptomus sp.	Nauplius sp.	Total Copepoda	Total Entomostraca	Glochidia
4/16	6,400	12,800	25,600	44,800	44,800	
4/19	38,400	52,896	79,344	170,640	170,640	
4/23	22,400	6,400	132,240	161,040	161,040	
4/26	41,600	22,400	185,136	249,136	249,136	
4/30	38,400	44,800	79,344	162,544	162,544	
5/3	80,000	6,400	132,240	218,640	218,640	
5/7	73,600		185,136	258,736	258,736	
5/11	51,200		423,168	474,368	474,368	
5/14	57,600		1,005,024	1,062,624	1,062,624	
5/17	211,584		264,480	475,964	479,164	
5/21	57,600		634,752	692,352	692,352	
5/24	249,600		1,163,712	1,413,312	1,419,712	
5/27	192,000		952,128	1,144,128	1,144,128	
5/31	460,800		899,232	1,360,032	1,360,032	
6/3	317,376		899,232	1,216,608	1,223,008	
6/7	147,200		872,784	1,019,984	1,026,384	
6/11	264,480		1,375,296	1,639,776	1,646,176	
6/16	115,200		211,584	326,784	326,784	
6/18	179,200		317,376	496,576	496,576	
6/21	76,800		846,336	923,136	929,536	
6/25	317,376		528,960	846,436	852,836	
6/28	264,480		476,064	740,544	740,544	
7/3	179,200		423,168	602,368	602,368	
7/5	268,800		1,057,920	1,326,720	1,333,120	
7/9	370,272		1,163,712	1,533,984	1,533,984	
7/12	740,544		846,336	1,586,880	1,593,280	
7/16	454,400		793,440	1,247,840	1,247,840	
7/19	687,648		740,544	1,428,192	1,440,992	6,400
7/23	264,480		1,110,816	1,375,296	1,375,296	
7/26	264,480		687,648	952,128	958,528	
7/30	317,376		740,544	1,057,920	1,064,320	3,200
8/2	581,856		1,322,400	1,904,256	1,917,056	
8/6	264,480		1,269,504	1,533,984	1,533,984	
8/9	317,376	25,600	1,005,024	1,348,000	1,354,400	
8/13	1,005,024		1,692,672	2,697,696	2,697,696	
8/15	476,064		1,110,816	1,586,880	1,586,880	
8/20	740,544		846,336	1,586,880	1,590,080	3,200
8/23	476,064		846,336	1,322,400	1,341,600	
8/27	634,752		1,216,608	1,851,360	1,857,760	
8/31	317,376		793,440	1,110,816	1,117,216	
9/2	793,440		1,586,880	2,380,320	2,405,920	
9/6	264,480		1,269,504	1,533,984	1,533,984	
9/9	581,856		1,322,400	1,904,256	1,917,056	
9/13	476,064		1,005,024	1,481,088	1,481,088	
9/17	370,272		1,110,816	1,481,088	1,500,288	
9/20	370,272		370,272	740,544	740,544	
9/24	224,000		952,128	1,176,128	1,195,328	
9/27	317,376		687,648	1,005,024	1,017,824	
10/1	211,584		264,480	476,064	601,056	
10/4	211,584		211,584	423,168	435,968	
10/8	134,400		528,960	663,360	676,160	
10/11	158,688		105,792	264,480	264,480	
10/15	121,600		264,480	386,080	386,080	
10/18	64,000		158,688	222,688	229,088	
10/22	38,400		105,792	144,192	150,592	
10/26	158,688		105,792	264,480	264,480	
10/29	76,800		158,688	235,488	235,488	
11/1	29,600		211,584	211,584	211,584	
11/5	400		6,400	6,400	6,400	
11/8			12,800	12,800	12,800	
11/12	3,200		19,200	22,400	22,400	

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Cyclops sp.	Diaptomus sp.	Nauplius sp.	Total Copepoda	Total Entomostraca	Glochidia
11/15	12,800	...	211,584	224,384	224,384	...
11/19	28,800	...	79,344	108,144	111,344	...
11/22	158,688	...	12,800	171,488	171,488	
11/26	57,600	...	52,896	110,496	113,696	
11/30	22,400	...	52,896	75,296	75,296	...
12/ 3	79,344	...	132,240	211,584	211,584	...
12/ 6	22,400	...	54,400	76,800	76,800	...
12/10	52,896	...	8,800	61,696	61,696	...
12/14	26,448	...	39,672	66,120	66,120	...
12/17	3,200	...	2,400	5,600	5,600	...
12/20	46,284	...	400	46,684	47,484	...
12/24	4,000	...	3,200	7,200	7,200	...
12/27	1,600	...	19,836	21,436	21,436	...
12/31	4,800	...	12,000	16,800	16,800	...

1913	Macrobiotus sp.	Nematode larva	Nematode sp.	Total Miscellaneous	Total Organisms	
1/ 5	...	...	...	...	1,541,184	...
1/ 8	...	...	400	400	960,080	...
1/12	...	...	...	...	1,246,724	...
1/15	...	400	...	400	5,194,784	...
1/19	...	...	...	...	8,368,732	...
1/22	...	...	...	...	3,617,256	...
1/26	...	...	...	...	3,866,856	...
1/29	...	...	...	...	4,629,740	...
2/ 2	...	...	...	...	3,563,584	...
2/ 5	...	...	...	...	4,432,332	...
2/ 8	800	...	...	800	5,301,480	...
2/12	...	...	1,600	1,600	7,887,808	...
2/15	...	...	...	...	5,852,668	...
2/19	...	...	...	...	7,185,068	...
2/23	...	...	...	...	8,005,224	...
2/26	...	...	...	...	11,876,016	...
3/ 1	...	...	...	...	11,583,608	...
3/ 5	...	...	...	...	20,691,744	...
3/ 8	...	...	...	...	15,302,552	...
3/12	...	...	...	...	20,878,430	...
3/15	...	...	...	...	7,500,464	...
3/19	...	...	...	...	10,894,784	...
3/23	...	...	...	...	9,878,580	...
3/26	...	...	...	...	7,907,664	...
3/29	...	...	...	...	9,781,328	...
4/ 2	...	...	...	...	11,109,376	...
4/ 5	...	...	...	...	12,327,488	...
4/ 9	...	...	...	...	16,275,928	...
4/13	...	...	...	...	11,340,376	...
4/16	...	...	...	...	18,041,448	...
4/19	...	...	...	...	21,910,608	...
4/23	...	...	3,200	3,200	26,652,800	...
4/26	...	...	...	...	30,783,344	...
4/30	...	...	...	...	28,879,184	...
5/ 3	...	...	3,200	3,200	30,505,404	...
5/ 7	...	...	...		36,448,208	...
5/11	...	...	...	...	49,903,136	...
5/14	...	...	...	...	74,895,584	...
5/17	...	...	6,400	6,400	61,007,212	...
5/21	...	...	...	...	50,438,752	...
5/24	...	...	...	...	52,137,008	...
5/27	...	...	...	...	83,152,764	...
5/31	...	...	...	...	90,298,432	...

TABLE 1.—ORGANISMS PER CUBIC METER IN PLANKTON OF STOCKTON CHANNEL IN 1913—(*Continued*)

1913	Macrobiotus sp.	Nematode larva	Nematode sp.	Total Miscellaneous	Total Organisms
6/ 3	....	....	....	....	102,283,072
6/ 7	....	....	....	....	89,267,642
6/11	....	....	....	....	84,639,968
6/16					66,351,588
6/18	....	....	....	....	79,474,408
6/21	....	....	....	....	71,200,832
6/25	3,200	....	....	3,200	85,669,652
6/28	....	....	....	....	105,512,440
7/ 3	....	....	....	....	66,694,496
7/ 5	....	....	....	....	36,946,240
7/ 9	....	....	....	....	32,992,824
7/12	....	....	....	....	48,253,984
7/16					78,756,792
7/19	....	....	....	6,400	50,284,514
7/23	....	....	....	....	29,064,214
7/26	....	....	....	....	53,158,602
7/30	....	....	....	3,200	38,088,136
8/ 2					39,749,616
8/ 6	....	....	....	....	31,442,432
8/ 9	....	....	....	....	37,449,228
8/13	....	....	....	....	71,372,480
8/15	....	....	....	....	43,499,944
8/20	....	....	....	3,200	50,960,344
8/23	....	....	....	....	49,818,048
8/27	....	....	....	....	54,312,736
8/31	....	....	....	....	65,254,556
9/ 2	....	....	....	....	65,343,280
9/ 6	....	....	....	....	77,865,920
9/ 9	....	....	....	....	74,010,912
9/13	....	....	....	....	72,756,816
9/17	....	....	....	....	62,833,944
9/20	....	....	....	....	53,627,768
9/24	....	....	....	....	64,570,056
9/27	....	....	....	....	62,673,664
10/ 1	....	....	....	....	67,484,896
10/ 4	....	....	....	....	44,854,524
10/ 8	....	....	....	....	58,332,396
10/11					58,491,488
10/15	....	....	....	....	56,239,096
10/18	....	....	....	....	52,299,264
10/22	....	....	....	....	59,089,962
10/26	....	....	....	....	55,197,450
10/29	....	....	....	....	59,191,148
11/ 1	....	....	6,400	6,400	35,026,646
11/ 5	....	....	....	....	31,695,424
11/ 8	....	....	....	....	22,527,832
11/12	....	....	....	....	47,239,288
11/15	....	....	....	....	26,993,280
11/19	....	....	....	....	23,289,272
11/22					23,203,120
11/26	....	....	....	....	15,874,240
11/30	....	....	....	....	18,297,984
12/ 3					18,520,416
12/ 6	....	....	....	....	13,329,568
12/10	....	....	....	....	5,559,302
12/14					7,442,442
12/17	....	....	....	....	6,341,848
12/20					6,567,456
12/24	....	....	....	....	3,734,436
12/27					7,168,872
12/31					6,219,632

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913

1913	Spirillum undula	Total Bacteriaceae	Anabaena sp.	Aphanocapsa sp.	Gloeocapsa conglomerata	Gloeocapsa sp.
1/ 5						
1/12		400				
1/19						
1/25			400			
2/ 2			1,600			
2/ 8						
2/15						
2/23		79,344				
3/ 1						
3/ 8						105,792
3/15						1,600
2/23		52,896				3,200
3/29			264,480			3,200
4/ 5		317,376				
4/13						6,400
4/19						
4/26						3,200
5/ 3						
5/10						
5/17	3,200	3,200				
5/24						
5/31			423,168			
6/ 7	105,792	105,792				
6/16			12,800			
6/21			6,400	79,344		
6/28			502,512			
7/ 5			3,200			
7/12			1,904,256	185,136		105,792
7/19			1,692,672			370,272
7/26			1,745,568	528,960	211,584	581,856
8/ 2			1,533,984	634,752	3,200	740,544
8/ 9			2,221,632	1,269,504	3,200	476,064
8/15			2,115,840	317,376		581,856
8/23	105,792	105,792	1,586,880	634,752	12,800	793,440
8/31			1,163,712	317,376		423,168
9/ 6			740,544	12,800		317,376
9/13			423,168	211,584		317,376
9/20						423,168
9/27						740,544
10/ 4				25,600		528,960
10/11	105,792	105,792		211,584		211,584
10/18	105,792	105,792	105,792			211,584
10/26	105,792	105,792	12,800			12,800
11/ 1						105,792
11/ 8						6,400
11/15	52,896	52,896				158,688
11/22						79,344
11/30				52,896		
12/ 6						
12/14			3,200			
12/20			52,896			
12/27						52,896

1913	Gomphosphaera aponina	Inactis tinctoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria formosa
1/ 5				400		
1/12						19,836
1/19						400
1/25						26,448
2/ 2						1,600

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Gomphosphaera aponina	Inactis tinetoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria formosa
2/ 8	1,600					
2/15						
2/23						
3/ 1						
3/ 8	3,200					
3/15	52,896					1,600
3/23						
3/29						3,200
4/ 5						3,200
4/13	3,200			1,600	52,896	
4/19				52,896		
4/26					3,200	
5/ 3						105,792
5/10						
5/17						423,168
5/24						211,584
5/31						
6/ 7						423,168
6/16						528,960
6/21					52,896	79,344
6/28				52,896	3,200	211,584
7/ 5					158,688	52,896
7/12				290,928	583,456	1,600
7/19	3,200			476,064	3,808,512	
7/26	105,792			105,792	581,856	
8/ 2	3,200			158,688	952,128	6,400
8/ 9	3,200			211,584	793,440	6,400
8/15		211,584		3,200	1,114,016	6,400
8/23		634,752		105,792	4,178,784	
8/31		1,692,672	105,792		541,760	
9/ 6		2,115,840			317,376	
9/13		1,269,504	105,792	740,544	740,544	25,600
9/20	211,584	2,115,840		317,376	740,544	12,800
9/27		2,327,424		105,792	317,376	
10/ 4	25,600	634,752		317,376	528,960	105,792
10/11		105,792			12,800	
10/18				211,584	12,800	105,792
10/26				105,792	12,800	
11/ 1	52,896	105,792		6,400	158,688	
11/ 8						6,400
11/15			52,896	6,400		
11/22			1,600	1,600		1,600
11/30				1,600		
12/ 6						1,600
12/14						
12/20						1,600
12/27						1,600

1913	Oscillatoria sp.	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae	Actinastrum hantzschii
1/ 5						800
1/12					20,236	
1/19					400	
1/25			400		27,218	
2/ 2					3,200	
2/ 8					3,200	
2/15			52,896		52,896	1,600
2/23			52,896		52,896	
3/ 1						
3/ 8					108,992	52,896

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913—(*Continued*)

1913	Oscillatoria sp.	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae	Actinastrum hantzschii
3/15	...	...	3,200	...	59,296	3,200
3/23	52,896	...	...	...	56,096	52,896
3/29	1,600	...	52,896	...	325,376	396,720
4/5	...	...	1,600	...	4,800	...
4/13	...		3,200	...	64,096	3,200
4/19	...	...	...	...	52,896	...
4/26	1,600	...	...	...	8,003	12,800
5/3	...	...	79,344	...	185,136	...
5/10			...	...		...
5/17	...	...		423,168	846,336	
5/24	...	...	...	158,688	370,272	...
5/31	...	105,792	...	423,168	952,648	105,792
6/7	...	...	...	687,648	1,110,816	...
6/16	38,400	...	...	38,400	618,560	6,400
6/21	...	...	...	105,792	323,776	3,200
6/28	...	...	...	211,584	981,776	79,344
7/5	...	...	...	52,896	267,680	3,200
7/12	...	...	...	79,344	3,151,512	185,136
7/19	3,200	...	...	158,688	6,512,808	...
7/26	3,200	...	...	...	3,864,608	158,688
8/2	793,440	...	...	3,200	4,829,536	6,400
8/9	105,792	3,200	...	6,400	4,624,352	...
8/15	105,792	...	...	6,400	4,462,464	19,200
8/23	105,792	...	158,688	...	8,211,680	211,584
8/31	211,584	...	317,376	...	4,773,440	...
9/6	105,792	...	...	...	3,609,728	317,376
9/13	...	...	317,376	12,800	4,165,288	105,792
9/20	...	...		...	3,821,312	...
9/27	...	...	105,792	...	3,596,928	...
10/4	...	12,800	...	...	2,179,840	25,600
10/11	...	...	105,792	...	647,552	105,792
10/18	...	...	105,792	...	753,344	...
10/26	...		...	...	144,192	...
11/1	211,584	...	158,688	6,400	825,440	...
11/8	...	...	...	...	12,800	...
11/15	3,200	...	105,792	...	275,680	52,896
11/22	...	...	...	...	84,144	...
11/30	...	3,200	1,600	...	59,296	...
12/6	...	...	...	...	1,600	...
12/14	...	...	...	...	3,200	...
12/20	...	...	...	...	54,496	...
12/27	1,600	...	1,600	...	57,696	...

1913	Actinastrum hantzschii (large)	Coelastrum microporum	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum
1/5	...	...	1,200	400	...	...
1/12	...	...	800	400	...	...
1/19	...	...	26,448	2,400	...	...
1/25	...	...	19,836	400	400	...
2/2	...	...	24,000	16,000	...	...
2/8	...	...	51,200	60,800	...	...
2/15	...	...	41,600	16,000	3,200	...
2/23	...	...	79,344	105,792	1,600	...
3/1	...	...	48,000	19,200	...	3,200
3/8	...	...	132,240	19,200	1,600	1,600
3/15	...	...	185,136	185,136	...	...
3/23	...	...	41,600	54,400	1,600	...
3/29	...	...	28,800	3,200	9,600	105,792
4/5	...	...	105,792	12,800	1,600	...
4/13	...	...	35,200	19,200	1,600	3,200

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Actinastrum hantzschii (large)	Coelastrum microporum	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum
4/19	26,448		79,344	132,240		1,600
4/26	52,896		105,792	16,000		52,896
5/ 3			6,400	1,600	1,600	
5/10						
5/17			12,800	6,400		
5/24						
5/31	105,792					105,792
6/ 7						
6/16				6,400		
6/21	105,792		3,200	32,000		1,600
6/28			9,600	132,240		52,896
7/ 5			1,600	158,688	1,600	
7/12	105,792		3,200	661,200	35,200	3,200
7/19	581,856		25,600	1,322,400	12,800	3,200
7/26	476,064	158,688	6,400	1,798,464	6,400	108,992
8/ 2	158,688		25,600	2,062,944	105,792	3,200
8/ 9	317,376		158,688	899,232		
8/15	528,960	3,200	3,200	1,481,088	32,000	
8/23	1,533,984		158,688	2,697,696	476,064	317,376
8/31	1,586,880	317,376	12,800	2,433,216	25,600	
9/ 6	423,168	105,792	25,600	2,010,048	528,960	
9/31	528,960	317,376	211,584	2,327,424	25,600	
9/20	102,400	317,376	105,792	2,539,008	38,400	211,584
9/27	634,752	105,792	76,800	1,692,672	38,400	211,584
10/ 4	1,163,712		51,200	4,241,680	25,600	634,752
10/11	740,544	105,792	25,600	4,866,432	25,600	528,960
10/18	64,000		12,800	846,336	211,584	
10/26	51,200	105,792	25,600	1,163,712	12,800	
11/ 1	25,600		158,688	793,440	52,896	52,896
11/ 8		52,896	19,200	476,064		
11/15		52,896	6,400	89,600		105,792
11/22	52,896		9,600	79,344		1,600
11/30			6,400	79,344		
12/ 6				19,200		
12/14				52,89b		
12/20			6,400	12,800		
12/27				52,896	3,200	

1913	Richteriella botryoides	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera	Stigeoclonium sp.	Total Chlorophyceae
1/ 5			400			2,800
1/12			400			1,600
1/19		400	400			29,648
1/25			400			21,036
2/ 2			105,792			145,792
2/ 8			52,896			164,896
2/15			1,600			64,000
2/23		1,600	12,800			201,136
3/ 1			3,200			73,600
3/ 8			3,200			210,736
3/15	1,600		52,896			427,968
3/23		1,600	132,240			233,040
3/29	1,600	3,200	211,584			762,096
4/ 5		1,600				121,792
4/13			105,792			177,792
4/19		1,600				240,232
4/26	1,600		79,344			321,328
5/ 3					3,200	9,600
5/10						
5/17			3,200			22,400

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Richteriella botryoides	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera	Stigeoclonium sp.	Ttotal Chlorophyceae
5/24		3,200				3,200
5/31		105,792	105,792			528,960
6/3		211,584	12,800			224,384
6/16		3,200			6,400	16,000
6/21			3,200			148,992
6/28			3,200			277,270
7/5			3,200			168,288
7/12			1,600			998,528
7/19		3,200	211,584			2,160,640
7/26		3,200	317,376			3,034,272
8/2		158,688	476,064			2,997,376
8/9		3,200	105,792			1,484,288
8/15		6,400	158,688			4,827,840
8/23			581,856			8,251,776
8/31		105,792	1,057,920			5,539,584
9/6	952,128	105,792	952,128			5,420,992
9/13	12,800		528,960			4,058,496
9/20			1,057,920			4,371,480
9/27		105,792	423,168			6,288,960
10/4		423,168	846,336			7,212,048
10/11		317,376	952,128			7,774,016
10/18		211,584	952,128	105,792		2,397,224
10/26	105,792	105,792	1,057,920			2,628,518
11/1	6,400	211,584	581,856			1,889,760
11/8		6,400	158,688			713,248
11/15		105,792	158,688	105,792		677,856
11/22		52,896	52,896			249,232
11/30		3,200	105,792			194,736
12/6						19,200
12/14		1,600		1,600		56,096
12/20		1,600	1,600			20,400
12/27			52,896			110,792

1913	Asterionella gracillima	Asterionella gracillima (large)	Amphiprora alata	Bacillaria paradoxa	Cocconeis pediculus	Cyclotella spp.
1/5	4,535,832			39,672		687,648
1/12	945,516			1,200	400	1,031,472
1/19	8,483,196			6,400		1,533,984
1/25	932,292			9,600		515,736
2/2	9,283,248		1,600	8,000		740,544
2/8	9,918,000	1,600		12,800		1,295,952
2/15	1,904,256			19,200		1,216,608
2/23	2,353,872			9,600		2,136,496
3/1	819,888					10,955,872
3/8	2,274,528			6,400		6,030,144
3/15	1,005,024			25,600		3,967,200
3/23	1,930,704	52,896		9,600		3,358,896
3/29	2,512,560	105,792		6,400		2,115,840
4/5	52,896			581,856		819,888
4/13	555,408	16,000	1,600	41,600		714,096
4/19	687,648	105,792		264,480		1,428,192
4/26	449,616	79,344		185,136		766,992
5/3	290,928			211,584		846,336
5/10	2,803,488			105,792		476,064
5/17	158,688	2,164,736			3,200	1,269,504
5/24	211,584	423,168		19,200	3,200	1,110,816
5/31	1,428,192				105,792	2,539,008
6/7	1,216,608	3,067,968	105,792	38,400	25,600	2,856,384
6/16	3,173,760	2,909,280		12,800	3,200	1,745,568
6/21	4,549,056	4,443,264		19,200	1,600	608,304

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Asterionella gracillima	Asterionella gracillima (large)	Amphiprora alata	Bacillaria paradoxa	Cocconeis pediculus	Cyclotella spp.
6/28	4,866,432	2,962,176		79,344		396,720
7/ 5	608,304	52,896		396,720	1,600	423,168
7/12		79,344		1,248,848		1,269,504
7/19				8,569,152		5,130,912
7/26				3,702,720		10,050,240
8/ 2				21,528,672		10,261,824
8/ 9		3,200		15,392,736		3,596,928
8/15				4,760,640		3,332,448
8/23		3,200		2,062,944		9,045,216
8/31			105,792	4,972,224		14,176,128
9/ 6				846,336	12,800	14,176,128
9/13				4,453,264		14,493,504
9/20				3,067,968		15,868,800
9/27				1,692,672		11,954,496
10/ 4				1,481,088		17,783,116
10/11				528,960		49,300,272
10/18				317,376		42,750,016
10/26				76,800		31,218,700
11/ 1	52,896			158,688		8,569,152
11/ 8	6,400	12,800		105,792		3,702,720
11/15	105,792	12,800		19,200		3,279,552
11/22	1,600	211,584		290,928	1,600	1,533,984
11/30	9,600	52,896		1,322,400		1,246,056
12/ 6	4,443,264			2,909,280	3,200	795,040
12/14	449,616	290,928		2,195,184		1,216,608
12/20	476,064	79,344	1,600	555,408	1,600	1,904,256
12/27	79,344			1,216,608	1,600	1,190,160

1913	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis	Cymbella sp.	Cymbella tumida	Diatom unidentified
1/ 5			800			
1/12			400	400		
1/19						400
1/25	400		800	26,448		
2/ 2	1,600		6,400	79,344		1,600
2/ 8				3,200	3,200	6,400
2/15	6,400		6,400	6,400		3,200
2/23	3,200		3,200	52,896		1,600
3/ 1	3,200		3,200	1,600	6,400	1,600
3/ 8		1,600				
3/15		3,200	6,400			
3/23	3,200	1,600	3,200		3,200	
3/29		79,344	9,600		3,200	1,600
4/ 5	6,400	158,688	3,200		79,344	
4/13	3,200	79,344				52,896
4/19	19,200	79,344	12,800			1,600
4/26	12,800	105,792				
5/ 3	12,800	185,136	3,200		185,136	211,584
5/10	132,240	238,032	19,200		79,344	105,792
5/17	44,800	211,584	12,800		264,480	3,200
5/24	32,000	211,584	12,800		76,800	317,376
5/31	76,800	899,232	12,800		12,800	
6/ 7	51,200	528,960	25,600		64,000	317,376
6/16	19,200	211,584	158,688		32,000	6,400
6/21	19,200	105,792	16,000	3,200	6,400	
6/28	12,800	79,344	3,200		3,200	
7/ 5		6,400			3,200	
7/12	9,600		3,200		6,400	
7/19					3,200	
7/26	12,800				6,400	3,200

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913—(*Continued*)

1913	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis	Cymbella sp.	Cymbella tumida	Diatom unidentified
8/ 2		3,200				
8/ 9		3,200	6,400		6,400	
8/15	6,400		6,400		19,200	
8/23						
8/31	12,800				211,584	
9/ 6		105,792				
9/13	12,800		25,600			
9/20	12,800					
9/27	12,800		12,800			
10/ 4		211,584				
10/11		211,584	12,800		12,800	
10/18		105,792			25,600	
10/26			12,800			
11/ 1	6,400		6,400		6,400	
11/ 8	12,800		6,400		19,200	
11/15					52,896	
11/22	1,600		6,400		3,200	
11/30	3,200				32,000	
12/ 6						
12/14		1,600	3,200			
12/20	9,600		3,200		3,200	
12/27		1,600				

1913	Epithemia ocellata	Eunotia sp.	Fragillaria capucina	Fragillaria crotonensis	Fragillaria sp.	Gomphonema constrictum
1/ 5						
1/12			400			
1/19			2,400			
1/25			39,672			400
2/ 2			9,600			
2/ 8			6,400			
2/15			12,800			
2/23			12,800			
3/ 1	12,800		12,800			
3/ 8			16,000			
3/15	3,200		28,800			
3/23	3,200		132,240	1,600		
3/29	3,200		35,200	6,400		
4/ 5	6,400		22,400	1,600		52,896
4/13	3,200		79,344		1,600	
4/19	3,200		105,792			
4/26			158,688			52,896
5/ 3	3,200		158,688	52,896	158,688	
5/10	6,400		79,344		105,792	79,344
5/17	105,792		19,200			3,200
5/24	6,400		19,200			158,688
5/31	423,168		12,800			317,376
6/ 7	51,200	105,792	51,200		528,960	317,376
6/16	12,800		19,200			158,688
6/21	1,600		22,400			1,600
6/28	11,200		79,344			1,600
7/ 5	3,200		6,400		6,400	
7/12	1,600				1,600	
7/19	6,400		6,400			
7/26	3,200		6,400			
8/ 2	6,400		6,400			3,200
8/ 9	12,800		6,400		3,200	
8/15	6,400		6,400			
8/23					6,400	
8/31	12,800				105,792	

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Epithemia ocellata	Eunotia sp.	Fragillaria capucina	Fragillaria crotonensis	Fragillaria sp.	Gomphonema constrictum
9/ 6			105,792			
9/13	25,600		105,792	105,792		
9/20						
9/27		12,800				
10/ 4			25,600			
10/11	12,800					
10/18						
10/26		12,800	12,800			
11/ 1	12,800		6,400			
11/ 8	6,400		6,400	52,896		
11/15			12,800			
11/22			1,600	9,600		
11/30	3,200		3,200			
12/ 6			3,200			
12/14						
12/20	9,600					1,600
12/27	52,896	1,600	6,400			

1913	Gomphonema sp.	Gyrosigma acuminatum	Gyrosigma kützingii	Gyrosigma scalproides	Mastogloia braunii	Melosira granulata
1/ 5			2,000			26,448
1/12						19,836
1/19			1,200			30,060
1/25	400		13,224	13,224		85,956
2/ 2			6,400	1,600		608,304
2/ 8			52,896	1,600		502,512
2/15			6,400			634,752
2/23			6,400			1,428,192
3/ 1			3,200			343,824
3/ 8			3,200	52,896		925,680
3/15			79,344			3,438,240
3/23			79,344		6,400	1,877,808
3/29	1,600		132,240		3,200	1,533,984
4/ 5		79,344	79,344	52,896		396,720
4/13	1,600	3,200	25,600	3,200		3,808,512
4/19	105,792	105,792	158,688			7,696,368
4/26			4,800	1,600		6,056,592
5/ 3			158,688			1,243,056
5/10		1,600	79,344	52,896		1,586,880
5/17			211,584	105,792		3,491,136
5/24		3,200	158,688	3,200		2,274,528
5/31			83,200			4,866,432
6/ 7			38,400			4,654,848
6/16			211,584			3,279,552
6/21			12,800			8,198,880
6/28	1,600		12,800	3,200		19,016,112
7/ 5			132,240			11,372,640
7/12			105,792			19,994,688
7/19			19,200			27,294,336
7/26			264,480	12,800		26,871,168
8/ 2			264,480	476,064		65,273,664
8/ 9	6,400		264,480	846,336		61,465,152
8/15			317,376			74,636,256
8/23		105,792	370,272			169,478,784
8/31		423,168	423,168			141,443,904
9/ 6			423,168			180,057,984
9/13			317,376			101,242,944
9/20		105,792	105,792			98,809,728
9/27		25,600	25,600			55,646,592

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913—(*Continued*)

1913	Gomphonema sp.	Gyrosigma acuminatum	Gyrosigma kützingii	Gyrosigma scalproides	Mastogloia braunii	Melosira granulata
10/4	105,792		105,792			45,914,928
10/11	105,792	423,168	105,792			73,852,864
10/18			211,584			25,505,920
10/26						12,483,456
11/1			12,800			12,007,392
11/8		12,800	105,792			4,178,784
11/15		6,400				1,481,088
11/22	1,600		52,896			3,041,520
11/30	1,600		6,400			14,176,128
12/6			1,600			2,142,288
12/14			79,344			608,304
12/20			3,200			846,336
12/27	1,600		1,600			661,200

1913	Melosira granulata A (small)	Melosira varians	Navicula affinis	Navicula alpestris	Navicula bacillum	Navicula didyma
1/5		52,896				
1/12		4,800				
1/19		39,672	19,836			
1/25		79,344				
2/2		79,344				
2/8		44,800				3,200
2/15		185,136				
2/23		105,792				
3/1		158,688				
3/8		105,792		264,480		
3/15		449,616	1,600	79,344		
3/23		264,480	1,600	105,792		3,200
3/29	5,368,944	290,928	105,792	52,896		
4/5	1,600	343,824	6,400	52,896		
4/13	1,243,056	185,136	1,600	1,600		52,896
4/19	290,928	528,960		79,344	238,032	52,896
4/26	238,032	581,856	3,200	79,344	185,136	
5/3	52,896	502,512	52,896	79,344	185,136	
5/10	185,136	634,752	52,896	185,136	343,824	
5/17		1,163,712		3,200	793,440	
5/24	211,584	634,752		264,480	634,752	
5/31	634,752	1,216,608		899,232	1,005,024	
6/7		793,440		317,376	1,322,400	
6/16		317,376		317,376	581,856	
6/21		238,032	3,200	3,200	211,584	1,600
6/28		449,616	79,344	3,200	79,344	1,600
7/5		132,240		52,896	79,344	
7/12		238,032		52,896	52,896	
7/19		105,792			105,792	
7/26		158,688		3,200		
8/2		158,688			105,792	
8/9		158,688			105,792	3,200
8/15		12,800		3,200	158,688	
8/23		105,792		264,480		3,200
8/31					105,792	211,584
9/6		211,584		317,376	317,376	
9/13		105,792		12,800	740,544	
9/20		105,792		105,792	211,584	
9/27					105,792	
10/4				211,584	105,792	
10/11		211,584			211,584	
10/18					211,584	
10/26					317,376	

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Melosira granulata A (small)	Melosira varians	Navicula affinis	Navicula alpestris	Navicula bacillum	Navicula didyma
11/ 1		211,584		158,688		
11/ 8		105,792			52,896	52,896
11/15		12,800				
11/22		19,200				
11/30		52,896		3,200		
12/ 6		79,344		1,600	52,896	
12/14		52,896			1,600	
12/20		12,800		6,400	52,896	
12/27		423,168		3,200	132,240	

1913	Navicula dubia	Navicula gracilis	Navicula sp.	Navicula viridis	Nitzschia acicularis	Nitzschia angularis
1/ 5			59,908	400	39,672	
1/12			800	800	39,672	
1/19				13,224	19,836	
1/25		72,732	13,224	1,200	59,508	400
2/ 2		158,688		3,200	185,136	8,000
2/ 8		185,136	3,200	3,200	52,896	6,400
2/15		105,792			105,792	3,200
2/23		105,792	1,600	1,600	52,896	6,400
3/ 1		132,240	80,944	6,400	52,896	3,200
3/ 8		1,600	105,792	3,200	133,840	6,400
3/15		423,168	1,600	6,400	105,792	9,600
3/23		343,824	1,600	6,400	1,600	3,200
3/29		264,480	4,800	6,400	264,480	3,200
4/ 5		423,168	3,200	19,200	132,240	132,240
4/13		317,376	105,792	6,400	80,944	
4/19		793,440		3,200	105,792	79,344
4/26		581,856	3,200	3,200	608,304	3,200
5/ 3		290,928		132,240	158,688	105,792
5/10		661,200	79,344	185,136	52,896	79,344
5/17		1,745,568	16,000	38,400	105,792	211,584
5/24		1,586,880	161,888	158,688	264,480	32,000
5/31		1,110,816	105,792	211,584	1,005,024	25,600
6/ 7		1,216,608	105,792	96,000	1,216,608	64,000
6/16	3,200	634,752		19,200	581,856	19,200
6/21		132,240		3,200	528,960	9,600
6/28		185,136		25,600	581,856	12,800
7/ 5		264,480	4,800	3,200	370,272	
7/12		528,960	3,200	6,400	264,480	3,200
7/19		423,168			740,544	
7/26		846,336	6,400		423,168	
8/ 2	12,800	793,440		19,200	476,064	
8/ 9		1,639,776		12,800	158,688	105,792
8/15		2,750,592		3,200	317,376	
8/23	158,688	3,649,824			370,272	
8/31		3,596,928		105,792	846,336	
9/ 6		2,644,800			1,057,920	
9/13		1,798,464		25,600	634,752	
9/20		1,269,504			317,376	12,800
9/27		846,336		211,584	317,376	
10/ 4		740,544		25,600	846,336	
10/11		1,481,088		12,800	634,752	
10/18		423,168	105,792		528,960	
10/26	105,792	423,168		25,600	423,168	
11/ 1		52,896		12,800	264,480	
11/ 8		211,584		6,400	105,792	
11/15		52,896		6,400	370,272	
11/22		185,136			52,896	

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Navicula dubia	Navicula gracilis	Navicula sp.	Navicula viridis	Nitzschia acicularis	Nitzschia angularis
11/30		476,064		3,200	52,896	
12/6		396,720			79,344	
12/14		132,240			158,688	
12/20		185,136			1,600	
12/27		264,480	6,400	3,200	52,896	

1913	Nitzschia sigma	Nitzschia sigmoidea	Nitzschia sp.	Nitzschia vermicularis	Pleurostauron parvulum	Rhopalodia gibba
1/5				400	238,032	
1/12					145,464	
1/19			79,344		238,032	
1/25		400	23,436		522,348	
2/2				4,800	396,720	
2/8	1,600				476,064	
2/15		3,200		12,800	423,168	
2/23		1,600			238,032	
3/1		52,896			264,480	
3/8		1,600		1,600	502,512	
3/15				3,200	317,376	
3/23		3,200	1,600		476,064	
3/29		79,344		9,600	581,856	
4/5		3,200	52,896		343,824	
4/13		79,344	52,896		502,512	
4/19			158,688		132,240	
4/26	6,400	52,896			661,200	
5/3	3,200	9,600	343,824		449,616	
5/10	52,896	52,896	52,896		132,240	
5/17	211,584	12,800	108,992	6,400	687,648	
5/24	3,200	6,400	423,168		793,440	
5/31	317,376	105,792	899,232		1,216,608	
6/7	317,376	105,792	317,376		793,440	
6/16	6,400	12,800	214,784	6,400	211,584	6,400
6/21	3,200	3,200	52,896		79,344	3,200
6/28	3,200	6,400	52,896		1,600	
7/5		6,400	1,600	3,200	1,600	
7/12			185,136	1,600	132,240	
7/19			158,688		3,200	
7/26			3,200	6,400	264,480	
8/2	6,400		370,272	6,400	105,792	
8/9	105,792		476,064			
8/15	105,792		370,272	6,400	105,792	
8/23	211,584		2,539,008	105,792		
8/31	105,792			25,600	105,792	
9/6	105,792			423,168		
9/13	105,792			317,376		
9/20	105,792			211,584		
9/27	105,792			105,792	317,376	
10/4	317,376			12,800	211,584	
10/11				12,800	317,376	
10/18	12,800		12,800	51,200	105,792	
10/26					12,800	
11/1				12,800	52,896	
11/8				6,400	2,896	
11/15				6,400	52,896	
11/22	3,200				158,688	
11/30	3,200	1,600			132,240	
12/6	1,600				52,896	
12/14	3,200				238,032	
12/20	3,200				158,688	
12/27	3,200				211,584	

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Stauroneis phoenicenteron	Surirella sp.	Synedra radians	Synedra ulna	Tabellaria sp.	Total Bacillariaceae
1/ 5	......	800	......	125,6 8	400	5,809,536
1/12	400	400		59,508	......	2,251,768
1/19		34,260		469,452	......	10,974,996
1/25	400	73,108		178,524	......	2,663,576
2/ 2		120,192		290,928	......	11,996,848
2/ 8		83,200		264,480	......	12,933,536
2/15	3,200	118,400		238,032	......	5,016,736
2/23		67,200		264,480	......	6,856,748
3/ 1		264,480		185,136	......	13,325,744
3/ 8		211,584		370,272	......	11,019,120
3/15		264,480		581,856	......	10,801,04)
3/23		211,584		290,928	......	9,134,064
3/29		264,480		370,272		14,115,040
4/ 5		555,408		661,200		5,260,608
4/13		185,136		687,648		8,892,336
4/19		555,408		502,512		14,298,672
4/26		211,584		211,584		11,305,248
5/ 3	3,200	1,084,368		502,512		7,678,572
5/10	3,200	978,576		819,888		10,505,408
5/17	211,584	1,798,464		899,232		16,196,288
5/24	•12,800	634,752		740,544	......	11,764,928
5/31		793,440		687,648		21,702,976
6/ 7		1,428,192		687,648		22,407,344
6/1)		793,44)		423,168		16,107,296
6/21		290,928		211,584		19,785,264
6/28	6,400	528,960		290,928	6,400	29,834,352
7/ 5	3,200	158,688		79,344	......	14,174,332
7/12		581,856		158,688	......	25,030,060
7/19		423,168	476,064	105,792	3,200	43,575,008
7/26	3,200	952,128	370,272	211,584	......	44,644,352
8/ 2	3,200	2,539,008	370,272	317,376	3,200	102,741,536
8/ 9		4,707,744	105,792	317,376	......	90,369,664
8/15	12,800	1,745,568	370,272	105,792	......	90,117,192
8/23		2,010,048	476,064	211,584	......	193,347,650
8/31		2,327,424	1,057,920	4,866,432		178,086,636
9/ 6		1,269,504	1,057,920	2,750,592		211,605,800
9/13		1,481,088	211,584	6,463,312		132,958,752
9/20	12,800	846,336	317,376	1,904,256		123,920,832
9/27		1,163,712	317,376	1,269,504		74,461,376
10/ 4		925,128	423,168	2,433,216		72,648,572
10/11		1,269,504	634,752	2,327,424		132,110,672
10/18		634,752	105,792	846,336		71,980,864
10/26	12,800	1,163,712	317,376	634,752	......	47,266,700
11 1		423,168	423,168	476,064	......	22,980,768
11/ 8	6,400	952,128	52,896	158,688	......	10,205,536
11/15		83,200	52,896	105,792		5,766,976
11/22		423,168	185,136	158,688		6,451,616
11/30		317,376	1,600	158,688		18,058,240
12/ 6	......	185,136		317,376		11,466,384
12/14	3,200	238,032	132,240	185.136		6,252,552
12/20		264,480	52,896	132,240	......	4,821,440
12/27		528,960	1,600	264,480	......	5,190,960

1913	Algae unidentified	Closterium acerosum	Closterium acuminatum	Closterium rostratum	Mougeotia sp.	Spirogyra protecta
1/ 5					800	
1/12					....	2,800
1/19					400	
1/25		1,600				
2/ 2		1,600				......

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Algae unidentified	Closterium acerosum	Closterium acuminatum	Closterium rostratum	Mougeotia sp.	Spirogyra protecta
2/ 8		3,200				
2/15		6,400				
2/23	1,600					3,200
3/ 1					1,600	
3/ 8		3,200				
3/15						
3/23				1,600		3,200
3/29						
4/ 5		6,400			3,200	238,032
4/13						
4/19		3,200				
4/26						
5/ 3					3,200	
5/10		3,200				
5/17						6,400
5/24		6,400				
5/31		12,800				
6/ 7						
6/16						
6/21		3,200				
6/28		12,800	3,200			
7/ 5		3,200			3,200	
7/12			6,400		555,408	
7/19		6,400			370,272	
7/26		12,800			476,064	
8/ 2		25,600	12,800		370,272	
8/ 9		38,400			581,856	
8/15				3,200	2,591,904	
8/23		19,200			2,380,320	
8/31		12,800		211,584	4,347,472	
9/ 6		64,000			211,584	
9/13		38,400			952,128	
9/20		12,800		105,792	317,376	
9/27		25,600				
10/ 4				105,792		
10/11		25,600			317,376	
10/18						
10/26						
11/ 1		6,400				
11/ 8						
11/15					158,688	
11/22		3,200			1,600	
11/30		3,200		1,600		
12/ 6		3,200				
12/14		3,200				
12/20				3,200		
12/27		1,600			1,600	79,344

1913	Spirogyra sp.	Staurastrum A	Staurastrum sp.	Total Conjugatae	Total Chlorophyll bearing	Total Algae
1/ 5	800			1,600	5,814,336	5,813,936
1/12				1,800	2,278,204	2,275,804
1/19	1,200			3,200	13,272,348	11,008,244
1/25	19,836			21,436	3,660,576	2,733,296
2/ 2				1,600	13,769,920	12,047,440
2/ 8				23,036	16,125,644	13,124,668
2/15		6,400		12,800	8,114,160	5,146,432
2/23		3,200		8,000	9,711,436	7,198,124
3/ 1				1,600	14,171,888	13,400,944
3/ 8		6,400		9,600	11,555,584	11,348,448

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Spirogyra sp.	Staurastrum A	Staurastrum sp.	Total Conjugatae	Total Chlorophyll bearing	Total Algae
3/15	1,600			3,200	11,562,384	11,291,504
3/23	3,200			11,200	10,227,840	9,487,296
3/29		3,200		6,400	16,907,984	15,208,872
4/ 5	3,200	1,600		252,432	5,806,320	5,957,008
4/13					9,506,848	9,134,224
4/19				3,200	14,702,392	14,595,000
4/26			1,600		11,812,464	11,634,576
5/ 3				6,400	8,145,788	7,879,708
5/10				3,200	10,720,192	10,508,608
5/17				6,400	17,202,816	17,074,624
5/24			3,200	9,600	12,260,192	12,148,000
5/31				12,800	24,202,408	23,197,384
6/ 7					24,771,432	23,848,336
6/16	6,400			12,800	17,318,816	16,754,656
6/21				6,400	20,548,016	20,264,432
6/28		1,600		17,600	31,173,494	31,110,998
7/ 5		52,896	1,600	60,896	15,385,292	14,671,196
7/12		105,792		667,600	30,992,964	29,847,700
7/19		12,800	3,200	392,672	58,626,280	52,641,128
7/26		158,688	3,200	653,952	60,004,896	52,222,784
8/ 2		6,400	423,168	838,240	114,102,688	111,419,488
8/ 9		476,064	105,792	1,205,292	100,712,962	97,689,996
8/15		211,584	317,376	532,160	101,975,404	99,939,656
8/23		423,168	423,168	865,536	214,321,570	210,788,834
8/31		317,376		5,206,608	196,911,420	193,606,268
9/ 6	12,800	211,584	317,376	817,344	226,118,120	221,453,864
9/13		740,544	105,792	1,836,864	148,511,000	143,032,200
9/20		1,057,920	105,792	1,599,680	137,149,848	133,713,304
9/27		740,544		766,144	90,015,440	85,113,408
10/ 4		211,584	105,792	423,068	90,224,744	82,463,528
10/11		211,584	105,792	660,350	147,152,542	141,298,382
10/18		105,792		105,792	84,014,960	75,340,016
10/26					58,621,362	50,145,202
11/ 1				6,400	29,859,648	25,702,368
11/ 8					14,369,824	10,931,584
11/15				62,688	11,064,384	6,836,096
11/22		1,600		6,400	13,861,008	6,791,392
11/30		1,600		9,600	22,768,336	18,321,872
12/ 6				3,200	16,767,936	11,490,384
12/14		1,600		4,800	9,313,272	6,316,648
12/20				5,200	7,212,112	4,901,536
12/27				80,944	6,237,032	5,440,392

1913	Ceratium hirundinella	Cercomonas crassicauda	Chlamydomonas sp.	Chromulina sp	Dinobryon sertularia	Eudorina elegans
1/ 5						400
1/12						2,800
1/19				2,228,244		2,000
1/25				826,500		800
2/ 2				1,428,192		30,800
2/ 8				2,962,176		22,400
2/15				2,856,384		19,200
2/23				2,300,976		158,688
3/ 1				740,544		22,400
3/ 8				52,896		28,800
3/15				52,896	1,600	
3/23				290,928		158,688
3/29				978,576	3,200	502,512
4/ 5				105,792		6,400
4/13				158,688		25,600

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Ceratium hirundinella	Cercomonas crassicauda	Chlamydomonas sp.	Chromulina sp.	Dinobryon sertularia	Eudorina elegans
4/19						3,200
4/26				52,896		16,000
5/ 3						
5/10					158,688	
5/17				3,200	12,800	6,400
5/24			105,792			3,200
5/31						
6/ 7	12,800			105,792	12,800	51,200
6/16				264,480	158,688	25,600
6/21				158,688	3,200	64,000
6/28						3,200
7/ 5				555,408		105,792
7/12	1,600			555,408		502,512
7/19				5,818,560		44,800
7/26		3,200		6,823,584		317,376
8/ 2			3,200	2,010,048		105,792
8/ 9	6,400			1,057,920		1,481,088
8/15				1,481,088		6,400
8/23			3,200	3,067,968		19,200
8/31	12,800		317,376	2,644,800		
9/ 6				3,808,512		211,584
9/13	25,600			4,241,680		38,400
9/20		105,792		2,644,800		38,400
9/27			105,792	4,347,472		12,800
10/ 4				7,088,064		25,600
10/11				5,183,808		25,600
10/18				7,722,816		
10/26				8,251,776		105,792
11/ 1				3,914,304	6,400	105,792
11/ 8				2,962,176	105,792	52,896
11/15				3,914,304		52,896
11/22				6,717,792	132,240	3,200
11/30				4,231,680		52,896
12/ 6				5,183,808	1,600	12,800
12/14				2,988,624		3,200
12/20				2,142,288		3,200
12/27				793,440		

1913	Euglena viridis	Flagellate unidentified	Hemidinium nasutum	Pandorina morum	Peridinium cinctum	Phacus pleuronectes
1/ 5						
1/12						
1/19				400		
1/25				800		
2/ 2				4,800		
2/ 8				3,200		
2/15				12,800		
2/23		1,600		19,200		
3/ 1		3,200		3,200		
3/ 8				1,600		
3/15				3,200		
3/23				79,344		
3/29				79,344		
4/ 5						
4/13				3,200		
4/19				1,600		
4/26		3,200				
5/ 3		1,600				
5/10						
5/17		3,200				

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Euglena viridis	Flagellate unidentified	Hemidinium nasutum	Pandorina morum	Peridinium cinctum	Phacus pleuronectes
5/24						
5/31						
6/ 7	211,584			105,792		
6/16	3,200			6,400		
6/21				1,600		
6/28						
7/ 5					52,896	
7/12	1,600			79,344		
7/19				105,792		
7/26	105,792			3,200	3,200	
8/ 2	3,200			6,400		
8/ 9	3,200		105,792	105,792		
8/15	3,200		211,584		3,200	
8/23	6,400		105,792			
8/31						
9/ 6				12,800		
9/13			211,584			
9/20			105,792	105,792		
9/27						
10/ 4	105,792				105,792	
10/11			211,584			
10/18	105,792		528,960			
10/26						
11/ 1				6,400	52,896	
11/ 8						52,896
11/15				6,400	52,896	
11/22				52,896		1,600
11/30				52,896		
12/ 6						
12/14				3,200		
12/20	52,896			6,400		
12/27						

1913	Platydorina caudata	Pleodorina californica	Pleodorina illinoisensis	Pteromonas sp.	Trachelomonas euchlora	Trachelomonas volgensis
1/ 5						
1/12						
1/19						
1/25					66,120	
2/ 2						
2/ 8					1,600	
2/15						
2/23					52,896	
3/ 1						
3/ 8					132,240	
3/15					79,344	
3/23					79,344	
3/29					132,240	
4/ 5					52,896	
4/13					79,344	
4/19					52,896	
4/26						
5/ 3					132,240	
5/10					52,896	
5/17						
5/24					3,200	
5/31						
6/ 7					211,584	
6/16						
6/21		3,200				

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Cotinued*)

1913	Platydorina caudata	Pleodorina californica	Pleodorina illinoisensis	Pteromonas sp.	Trachelomonas euchlora	Trachelomonas volgensis
6/28						
7/ 5						
7/12		3,200				
7/19		12,800				
7/26	6,400	158,688		158,688		
8/ 2	19,200	158,688				
8/ 9	38,400	105,792	6,400			
8/15	12,800	158,688				
8/23	12,800	105,792				
8/31	12,800	211,584				
9/ 6		89,600				105,792
9/13	64,000	51,200				
9/20		12,800				105,792
9/27	12,800					
10/ 4		12,800				
10/11				105,792		
10/18						105,792
10/26		12,800				
11/ 1	6,400	6,400				
11/ 8			6,400			
11/15						
11/22	....	....	....	....	1,600	1,600
11/30						105,792
12/ 6						
12/14						
12/20						
12/27				1,600		

1913	Trachelomonas volvocina	Volvox aureus	Total Mastigophora	Amoeba proteus	Amoeba radiosa	Arcella vulgaris
1/ 5	....	....	400			
1/12	....	....	2,800			
1/19	33,060	....	2,264,104			
1/25	33,060	....	927,280			
2/ 2	79,344	....	1,622,480			
2/ 8	1,600	....	3,000,976			
2/15	79,344	....	3,028,528			
2/23	52,896	....	2,592,656			
3/ 1	1,600	....	770,944			
3/ 8	....	....	217,136			
3/15	132,240	....	270,880			
3/23	185,136	....	793,440			
3/29	1,600	....	1,699,072	3,200		
4/ 5	....	....	166,688	3,200		
4/13	105,792	....	372,624			1,600
4/19	52,896	....	107,392			
4/26	105,792	....	177,888		52,896	3,200
5/ 3	....	....	266,080			
5/10	1,600	....	211,584			
5/17	105,792	....	131,392		3,200	
5/24	....	....	112,192			
5/31	317,376	....	1,005,024			
6/ 7	317,376	....	1,028,888			12,800
6/16	105,792	....	564,160			
6/21	52,896	....	283,584			
6/28	52,896	....	62,496			3,200
7/ 5			714,096			
7/12	1,600	....	1,145,264	....	....	....
7/19	3,200	....	5,985,152	....	....	....
7/26	211,584	25,600	7,807,712	....		

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Trachelomonas volvocina	Volvox aureus	Total Mastigophora	Amoeba proteus	Amoeba radiosa	Arcella vulgaris
8/ 2	...	12,800	2,696,000	...	...	...
8/ 9	...	6,400	3,029,366	...	...	
8/15	158,688	...	2,035,748	3,200	...	
8/23	264,480	6,400	3,644,928	528,960	...	
8/31	423,168	...	3,622,528	...	...	
9/ 6	317,376	...	4,664,256	211,584	...	
9/13	740,544	12,800	5,491,600	...	...	
9/20	317,376	...	3,436,544	...	211,584	
9/27	423,168	...	4,902,032	...	...	
10/ 4	528,960	...	7,761,216	...	...	
10/11	423,168	...	5,959,952	...	105,792	
10/18	317,376	...	8,780,736	...	...	...
10/26	211,584	...	8,581,952	...	12,800	...
11/ 1	158,688	...	4,157,280	...	52,896	...
11/ 8	211,584	...	3,438,240	...	...	
11/15	105,792	...	4,281,184	...	158,688	
11/22	158,688	...	7,096,616	3,200	...	...
11/30	52,896	...	4,446,464	...	...	
12/ 6	79,344	...	5,277,552	...	...	...
12/14	1,600	...	2,996,624	...	...	...
12/20	52,896	...	2,310,576	...	1,600	...
12/27	1,[illegible]00	...	796,640			

1913	Cyphoderia ampulla	Difflugia corona	Difflugia pyriformis	Hyalodiscus sp.	Microgromia socialis	Total Rhizopoda
1/ 5	...	...	...	...	...	...
1/12	...	...	...	...	...	
1/19	...	...	...	...	...	...
1/25	...	...	400	...	...	400
2/ 2	...	...	1,600	...	...	1,600
2/ 8	...	...	1,600	...	...	1,600
2/15	...	...	12,800	...	...	12,800
2/23	...	...	19,200	...	79,344	98,544
3/ 1	...	...	3,200	...	...	4,800
3/ 8	...	...	9,600	...	...	12,800
3/15	...	...	...	...	...	...
3/23	...	...	...	...	...	1,600
3/29	...	...	...	...	...	3,200
4/ 5	...	...	6,400	...	...	16,000
4/13	...	...	6,400	...	...	8,000
4/19	52,896	...	79,344	...	...	132,240
4/26	...	...	32,000	...	...	88,096
5/ 3	...	...	...	...	...	
5/10	...	...	...	...		
5/17	...	...	19,200	...	...	22,400
5/24	...	...	6,400	...	...	6,400
5/31	...	...	634,752	...	...	634,752
6/ 7	12,800	...	793,440	...	...	104,944
6/16	...	...	158,688	...	...	158,688
6/21	...	...	211,584	...	...	211,584
6/28	...	...	185,136	...	...	189,936
7/ 5	...	...	158,688	...	...	158,688
7/12	3,200	...	132,240	...	1,600	146,640
7/19	...	...	...	...	...	3,200
7/26	...	...	12,800	...	158,688	171,488
8/ 2	...	...	6,400	...	158,688	168,288
8/ 9	...	...	...	...	...	3,200
8/15	...	6,400	19,200	3,200	105,792	131,392
8/23	...	...	...	...	158,688	1,189,312
8/31	...	12,800	105,792	317,376	211,584	647,552

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Cyphoderia ampulla	Difflugia corona	Difflugia pyriformis	Hyalodiscus sp.	Microgromia socialis	Total Rhizopoda
9/6	12,800	...	25,600	...	317,376	567,360
9/13	...	...	...	...	211,584	211,584
9/20	...	12,800	...	105,792	...	330,176
9/27	...	12,800	...	12,800	105,792	131,392
10/4	...	...	...	...	846,336	846,336
10/11	12,800	...	...	105,792	105,792	330,176
10/18	...	...	...	...	211,584	211,584
10/26	...	...	...	105,792	211,584	330,176
11/1	...	...	...	52,896	52,896	158,688
11/8	...	...	52,896	105,792	...	211,584
11/15	...	...	...	...	...	158,688
11/22	...	...	3,200	...	...	6,400
11/30	...	...	...	...	...	...
12/6	...	...	1,600	...	...	1,600
12/14	...	3,200	...	...	...	3,200
12/20	...	...	1,600	...	...	3,200
12/27	1,600	9,600	...	...	...	11,200

1913	Actinophrys sol.	Heterophrys fockei	Heterophrys sp.	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans
1/5	...	...	...	...	...	...
1/12	...	...	...	...	...	...
1/19	...	...	...	...	...	...
1/25	...	...	...	...	...	...
2/2	...	...	...	...	...	...
2/8	...	...	...	...	...	...
2/15	...	...	...	...	...	...
2/23	...	...	...	...	...	...
3/1	...	...	...	...	...	...
3/8	...	...	...	...	...	...
3/15	...	...	...	...	...	...
3/23	...	...	1,600	1,600	...	...
3/29	...	...	...	...	...	3,200
4/5	...	...	...	...	...	...
4/13	...	...	...	...	...	...
4/19	...	...	...	...	...	...
4/26	...	...	...	...	...	...
5/3	...	...	...	...	...	...
5/10	...	...	...	...	...	...
5/17	...	...	...	...	...	...
5/24	...	...	...	...	...	...
5/31	...	...	...	...	...	...
6/7	...	...	...	...	...	...
6/16	...	...	...	...	...	...
6/21	...	...	...	...	...	52,896
6/28	...	...	...	...	...	...
7/5	...	...	...	...	...	...
7/12	...	...	...	9,600	1,600	1,600
7/19	...	...	158,688	3,200	...	476,064
7/26	...	...	...	...	...	...
8/2	...	211,584	...	3,200	...	211,584
8/9	3,200	317,376	...	...	...	105,792
8/15	6,400	211,584	105,792	...	...	105,792
8/23	...	317,376	...	...	...	476,064
8/31	...	...	...	...	...	211,584
9/6	...	...	...	...	...	634,752
9/13	...	38,400	...	...	...	105,792
9/20	12,800	1,269,504	...	...	...	105,792
9/27	105,792	1,481,088	...	...	...	...

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Actinophrys sol.	Heterophrys fockei	Heterophrys sp.	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans
10/ 4		2,962,176				
10/11		317,376			1,269,504	
10/18		12,800			423,168	
10/26	12,800	105,792			317,376	
11/ 1						105,792
11/ 8						52,896
11/15					52,896	1,481,088
11/22					1,600	
11/30					1,600	1,600
12/ 6						
12/14						
12/20						
12/27						

1913	Total Heliozoa	Chilodon sp.	Ciliate unidentified	Coleps hirtus	Cyclidium sp.	Epistylis sp.
1/ 5						
1/12						
1/19			400			
1/25			400			
2/ 2			1,600			
2/ 8			6,400			
2/15			1,600			
2/23			6,400			
3/ 1			79,344			
3/ 8						3,200
3/15			1,600			
3/23	1,600		1,600			
3/29	3,200					
4/ 5			185,136			3,200
4/13						
4/19						
4/26						
5/ 3			105,792			
5/10						
5/17						
5/24						
5/31						
6/ 7						12,800
6/16						
6/21	52,896					
6/28						
7/ 5						
7/12	3,200					
7/19	476,064					
7/26						
8/ 2	423,168					
8/ 9	426,368	105,792				
8/15	429,568				105,792	
8/23	317,376				3,200	
8/31	211,584			105,792	105,792	
9/ 6	634,752				105,792	
9/13	144,192				105,792	
9/20	1,388,096					
9/27	1,586,880					
10/ 4	2,962,176					
10/11	1,586,880				105,792	
10/18	435,968					
10/26	435,968					

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Total Heliozoa	Chilodon sp.	Ciliate unidentified	Coleps hirtus	Cyclidium sp.	Epistylis sp.
11/1	105,792					
11/8	52,896	12,800		52,896		
11/15	1,533,984					
11/22	1,600					
11/30	3,200					
12/6						
12/14						
12/20						
12/27						

1913	Euplotes harpa	Euplotes patella	Holophrya sp.	Paramecium aurelia	Paramecium bursaria	Prorodon sp.
1/5						
1/12						
1/19	400					
1/25	400					
2/2						
2/8						
2/15	6,400					
2/23	12,800	3,200				1,600
3/1	3,200	3,200		3,200		3,200
3/8						
3/15	3,200		105,792			
3/23	16,000		79,344			
3/29	3,200		3,200			
4/5			105,792			
4/13			1,600			
4/19			132,240		3,200	6,400
4/26			1,600			
5/3			1,600		3,200	
5/10						
5/17			3,200			
5/24			264,480			
5/31			12,800			
6/7			211,584			
6/16			105,792			
6/21						
6/28						1,600
7/5						
7/12						
7/19			211,584			
7/26			317,376			
8/2			158,688			
6/9			528,960			
8/15			158,688			
8/23						3,200
8/31			211,584			
9/6						
9/13			105,792			
9/20			634,752		105,792	
9/27			105,792			
10/4			211,584			
10/11			105,792			
10/18						
10/26						12,800
11/1	6,400		52,896	19,200		
11/8			52,896			
11/15	264,480			51,200	105,792	6,400
11/22	9,600		105,792		3,200	

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Euplotes harpa	Euplotes patella	Holophrya sp.	Paramecium aurelia	Paramecium bursaria	Prorodon sp.
11/30						
12/ 6	52,896		1,600			
12/14	3,200					
12/20			1,600			
12/27						

1913	Stentor coeruleus	Stentor niger	Tintinnidium fluviatile	Vorticella longifilum	Vorticella sp.	Total Ciliata
1/ 5						
1/12						
1/19						800
1/25						800
2/ 2		1,600				4,800
2/ 8						297,328
2/15						9,600
2/23		3,200				162,640
3/ 1		3,200				148,240
3/ 8		3,200				558,708
3/15						110,592
3/23		3,200		6,400		529,712
3/29				3,200		429,568
4/ 5	3,200			3,200	3,200	303,728
4/13					79,344	213,184
4/19						379,872
4/26		3,200				216,384
5/ 3		6,400			132,240	249,232
5/10		6,400				6,400
5/17					158,688	373,472
5/24		3,200			264,480	532,160
5/31					793,440	806,240
6/ 7					793,440	1,017,824
6/16					158,688	267,680
6/21					105,792	105,792
6/28					3,200	4,800
7/ 5					211,584	211,584
7/12					211,584	211,584
7/19					1,057,920	1,269,504
7/26					528,960	846,336
8/ 2			,200		1,057,920	1,219,808
8/ 9					846,336	1,481,088
8/15					793,440	1,057,920
8/23					370,272	383,072
8/31					1,692,672	2,115,840
9/ 6					317,376	317,376
9/13					952,128	1,163,712
9/20					423,168	1,163,712
9/27					846,336	952,128
10/ 4				105,792	528,960	846,336
10/11					423,168	634,752
10/18			105,792		528,960	634,752
10/26				12,800	317,376	342,976
11/ 1			52,896		423,168	554,560
11/ 8					52,896	330,176
11/15					52,896	487,168
11/22			3,200			121,792
11/30					1,600	1,600
12/ 6	3,200	1,600			1,600	60,896
12/14			6,400			9,600
12/20				3,200	132,240	137,040
12/27		3,200	3,200			6,400

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Acineta sp.	Podophrya sp.	Sphaerophrya sp.	Total Suctoria	Total Protozoa without Mastigophora	Total Protozoa with Mastigophora
1/5						400
1/12						2,800
1/19					800	2,264,904
1/25					1,200	928,480
2/2					6,400	1,628,880
2/8					298,928	3,299,904
2/15					22,400	3,050,928
2/23					261,184	2,853,840
3/1					153,040	923,984
3/8					571,508	788,644
3/15					110,592	381,472
3/23					532,912	1,326,352
3/29					435,968	2,135,040
4/5					319,728	486,416
4/13					221,184	593,808
4/19					512,112	619,504
4/26	3,200			3,200	307,680	485,568
5/3					249,232	515,312
5/10					6,400	217,984
5/17					395,872	527,264
5/24					538,560	651,752
5/31					1,440,992	2,446,016
6/7					1,122,768	2,151,656
6/16					426,368	990,528
6/21					370,272	653,856
6/28					194,736	257,232
7/5					370,272	1,084,368
7/12	6,400			6,400	367,824	1,513,088
7/19					1,907,456	7,892,608
7/26					1,017,824	8,825,536
8/2					1,811,264	4,507,264
8/9			19,200	19,200	1,929,856	4,959,222
8/15	105,792			105,792	1,724,672	3,760,420
8/23					1,889,760	5,534,688
8/31					2,974,976	6,597,504
9/6					1,519,488	6,183,744
9/13					1,519,488	7,011,088
9/20			25,600	25,600	2,907,584	6,344,128
9/27			12,800	12,800	2,683,200	7,585,232
10/4	105,792		38,400	144,192	4,799,040	12,560,256
10/11					2,551,808	8,511,760
10/18			25,600	25,600	1,307,904	10,088,640
10/26	105,792			105,792	1,214,912	9,796,864
11/1					819,040	4,976,320
11/8					594,650	4,032,896
11/15					2,179,840	6,461,024
11/22			3,200	3,200	132,992	7,202,608
11/30		3,200	3,200	6,400	11,200	4,457,664
12/6		3,200	1,600	4,800	67,296	5,344,848
12/14	3,200			3,200	16,000	3,012,624
12/20					140,240	2,450,816
12/27		1,600		1,600	19,200	815,840

1913	Collotheca egg, attached	Collotheca pelagica	Collotheca sp.	Total Rhizota	Rotaria neptunia	Rotaria rotatoria
1/5						2,000
1/12						4,400
1/19					400	52,896
1/25				400	2,400	26,448
2/2						107,392

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Collotheca egg, attached	Collotheca pelagica	Collotheca sp.	Total Rhizota	Rotaria neptunia	Rotaria rotatoria
2/ 8						57,600
2/ 5						12,800
2/23						79,344
3/ 1						32,000
3/ 8						80,000
3/15						79,344
3/23					3,200	185,136
3/29						22,400
4/ 5						9,600
4/13						
4/19						
4/26						
5/ 3						
5/10						
5/17						6,400
5/24						6,400
5/31						
6/ 7						
6/16						
6/21						
6/28						3,200
7/ 5						
7/12					3,200	
7/19						
7/26						6,400
8/ 2					6,400	12,800
8/ 9			6,400			
8/15	83,200	158,688	6,400	248,288	12,800	19,200
8/23	83,200	317,376		400,576		6,400
8/31				12,800		12,800
9/ 6						
9/13	12,800	38,400		51,200		
9/20		51,200		51,200	12,800	
9/27	12,800	38,400		51,200		
10/ 4	128,300	140,800		268,800	25,600	25,600
10/11	76,800	115,200		192,000	25,600	
10/18	211,584	51,200		262,784	12,800	105,792
10/26	105,792	211,584		317,376		12,800
11/ 1		12,800		12,800	6,400	12,800
11/ 8		6,400		6,400		6,400
11/15	25,600	25,600		51,200	6,400	
11/22	3,200	3,200		6,400		
11/30						
12/ 6					3,200	6,400
12/14						6,400
12/20						6,400
12/27						

1913	Rotifer egg, winter	Rotifer egg, unidentified	Rotifer unidentified	Total Bdelloida	Anureaopsis fissa	Anureaopsis sp.
1/ 5				2,000		
1/12				4,400		
1/19			800	54,096		
1/25			6,000	34,848		
2/ 2			6,400	113,792		
2/ 8		1,600	19,200	76,800		
2/15			3,200	16,000		
2/23	3,200		12,800	92,144		
3/ 1			1,600	33,600		
3/ 8			52,896	132,240		

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913—(*Continued*)

1913	Rotifer egg, winter	Rotifer egg, unidentified	Rotifer unidentified	Total Bdelloida	Anureaopsis fissa	Anureaopsis sp.
3/15	...	...	9,600	88,944	...	...
3/23	...	16,000	...	188,336	...	
3/29	...	...	3,200	25,600	...	
4/5	...	...	6,400	16,000	...	
4/13	...	...	3,200	3,200	...	
4/19	...	1,600	6,400	6,400	...	...
4/26		1,600				
5/3						
5/10	1,600	...	22,400	22,400		
5/17	...	...	...	6,400		
5/24	12,800	...	...	6,400		3,200
5/31	...	...	12,800	12,800		
6/7	...	...	12,800	12,800		
6/16						
6/21	...	...	3,200	3,200		
6/28				3,200		
7/5	...	...	3,200	3,200		6,400
7/12	...	...	1,600	4,800		6,400
7/19					38,400	
7/26	...	...	...	6,400		
8/2	105,792	...	158,688	174,688	6,400	
8/9					105,792	
8/15	3,200		32,000	64,000	12,800	
8/23	...	...	12,800	19,200	105,792	
8/31	105,792	...	211,584	224,384	105,792	
9/6	...	...	...	...	12,800	
9/13	...	...	25,600	25,600	...	...
9/20	...	...	211,584	224,384	25,600	
9/27	...	...	105,792	105,792	...	...
10/4	...	...	105,792	156,992	12,800	...
10/11	25,600	...	38,400	64,000	...	...
10/18	38,400	...	211,584	330,176		
10/26				12,800		
11/1	6,400	...	...	19,200	6,400	
11/8	52,896	...	12,800	19,200	...	...
11/15	...	...	6,400	12,800		
11/22	1,600	...	...	...	3,200	
11/30						
12/6	3,200	...	...	9,600	...	
12/14	3,200	...	...	6,400	...	
12/20	1,600	...	...	6,400	1,600	
12/27			3,200	3,200		

1913	Asplanchna brightwellii	Asplanchnopus sp.	Brachionus angularis	Brachionus angularis caudatus	Brachionus budapestenensis	Brachionus calyciflorus
1/5	...	...	...	...	...	800
1/12	...	...	...	400	...	1,200
1/19	...	...	...	400	...	1,200
1/25	...	...	...	...	...	4,000
2/2		1,600				1,600
2/8						44,800
2/15						132,240
2/23	...	...	...	...	...	41,600
3/1						6,400
3/8	...	...	...	...	...	3,200
3/15	...	...	...	...	...	19,200
3/23	...	...	6,400	...	79,344	16,000
3/29	...	...	9,600	...	...	16,000
4/5	6,400	...	...	...	...	...
4/13						

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Asplanchna brightwellii	Asplanchnopus sp.	Brachionus angularis	Brachionus angularis caudatus	Brachionus budapestenensis	Brachionus calyciflorus
4/19			6,400			1,600
4/26						6,400
5/ 3			3,200			
5/10						6,400
5/17						
5/24			3,200			
5/31						
6/ 7						
6/16				6,400		
6/21			6,400	22,400		
6/28	6,400		3,200	35,200		
7/ 5			3,200	105,792	3,200	
7/12	3,200	3,200		714,096	1,600	
7/19				83,200	19,200	6,400
7/26						
8/ 2				211,584	105,792	
8/ 9				105,792	19,200	19,200
8/15				1,005,024	12,800	19,200
8/23			19,200	12,800	105,792	
8/31			38,400	317,376		25,600
9/ 6				25,600		
9/13				38,400		12,800
9/20			12,800	317,376		12,800
9/27				51,200	12,800	25,600
10/ 4				38,400	12,800	38,400
10/11				211,584	12,800	12,800
10/18				64,000		25,600
10/26						25,600
11/ 1			6,400	25,600		6,400
11/ 8			52,896			
11/15					6,400	
11/22			3,200			
11/30			3,200		1,600	
12/ 6						
12/14						1,600
12/20						
12/27						

1913	Brachionus capsuliflorus	Brachionus egg, attached female	Brachionus egg, attached male	Brachionus egg, free female	Brachionus patulus	Brachionus plicatilis
1/ 5				800		
1/12				4,000		400
1/19				400		
1/25		400		800		800
2/ 2				1,600		1,600
2/ 8		19,200		3,200		3 200
2/15			105,792	79,344		
2/23		41,600	6,400	6,400		
3/ 1				3,200		3,200
3/ 8				6,400		3,200
3/15		16,000		52,896		3,200
3/23	3,200	12.800		52,896		6,400
3/29		6,400		3,200		3,200
4/ 5	3,200			3,200		
4/13		52,896				3,200
4/19						
4/26		3,200		3,200		3,200
5/ 3						
5/10						
5/17						

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Brachionus capsuliflorus	Brachionus egg, attached female	Brachionus egg, attached male	Brachionus egg, free female	Brachionus patulus	Brachionus plicatilis
5/24	....	....	....	....	....	....
5/31	....	....	....	....	....	....
6/7	....	....	....	....	....	....
6/16	....	6,400	32,000	....	....	....
6/21	....	3,200	....	....	....	....
6/28	....	35,200	....	6,400	....	....
7/5	....	1,600	....	79,344	....	....
7/12	....	....	....	52,896	19,200	....
7/19	....	19,200	....	105,792	25,600	....
7/26	....	6,400	....	....	25,600	....
8/2	12,800	3,200	....	....	25,600	....
8/9	211,584	....	....	6,400	....	....
8/15	25,600	3,200	....	6,400	....	....
8/23	....	6,400	....	6,400	6,400	....
8/31	25,600	64,000	....	....	....	....
9/6	317,376	12,800	....	....	105,792	....
9/13	38,400	12,800	....	....	12,800	....
9/20	12,800	38,400	....	25,600	....	....
9/27	64,000	51,200	....	12,800	25,600	....
10/4	12,800	89,600	....	64,000	....	....
10/11	12,800	12,800	....	....	....	....
10/18	....	317,376	....	38,400	....	....
10/26	....	....	....	25,600	....	....
11/1	6,400	12,800	....	52,896	....	19,200
11/8	....	....	....	....	....	....
11/15	....	....	....	6,400	....	....
11/22	....	....	....	....	....	....
11/30	....	3,200	....	52,896	....	....
12/6	....	....	....	1,600	3,200	....
12/14	....	....	....	1,600	....	....
12/20	....	....	....	....	....	....
12/27	3,200	....	....	1,600	....	....

1913	Brachionus urceus	Diurella egg, free	Epiphanes clavulata	Epiphanes egg, attached female	Filinia egg, attached female	Filinia egg, free
1/5	....	....	....	....	....	....
1/12	1,200	....	....	....	....	....
1/19	400	....	....	....	....	....
1/25	....	....	....	....	....	....
2/2	3,200	....	....	....	....	....
2/8	3,200	....	....	....	....	....
2/15	6,400	....	....	....	....	9,600
2/23	....	....	....	....	3,200	19,200
3/1	....	....	....	....	9,600	22,400
3/8	....	....	....	....	3,200	105,792
3/15	....	....	....	....	....	238,032
3/23	....	....	....	....	3,200	....
3/29	....	....	....	....	....	....
4/5	....	....	....	....	....	....
4/13	1,600	....	....	....	....	....
4/19	3,200	....	....	....	....	....
4/26	3,200	....	....	....	....	1,600
5/3	....	....	....	....	....	....
5/10	....	....	....	....	....	....
5/17	....	....	....	....	....	3,200
5/24	6,400	....	....	....	....	....
5/31	....	....	....	....	....	....
6/7	38,400	....	....	....	....	....
6/16	32,000	6,400	....	....	....	....
6/21	9,600	....	....	....	....	1,600

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Brachionus urceus	Diurella egg, free	Epiphanes clavulata	Epiphanes egg, attached female	Filinia egg, attached female	Filinia egg, free
6/28	25,600	79,344	...	...	9,600	1,600
7/ 5	...	158,688	...	...	...	1,600
7/12	3,200	1,031,472	...	...	...	238,032
7/19	38,400	476,064	...	...	...	...
7/26	12,800	317,376	...	...	...	3,200
8/ 2	105,792	423,168	...	...	...	528,960
8/ 9	51,200	158,688	...	...	...	3,200
8/15	6,400	528,960	12,800	6,400	...	158,688
8/23	...	1,110,816	64,000	12,800	...	158,688
8/31	38,400	317,376	76,800	...	...	528,960
9/ 6	...	...	12,800	12,800	...	...
9/13	12,800	952,128	64,000	25,600	...	105,792
9/20	12,800	...	38,400	...	...	105,792
9/27	...	528,960	38,400	...	...	211,584
10/ 4	...	846,336	12,800	...	...	105,792
10/11	...	528,960	...	...	...	105,792
10/18	12,800	105,792	12,800	...	...	...
10/26	12,800	25,600	...			
11/ 1						
11/ 8						
11/15						
11/22						
11/30						
12/ 6						
12/14	3,200	...	...	...	...	1,600
12/20						
12/27						

1913	Filinia longiseta	Keratella cochlearis	Keratella egg, attached	Keratella egg, free	Keratella quadrata	Lecane luna
1/ 5	...	400	...	1,200	1,200	
1/12	...	1,200	800	2,400	1,200	
1/19	400	...	1,200	19,836	1,600	
1/25	...	1,200	...	33,060	1,200	
2/ 2	...	3,200	1,600	17,600	20,800	...
2/ 8	...	6,400	16,000	132,240	22,400	...
2/15	...	12,800	6,400	132,240	6,400	3,200
2/23	79,344	99,200	25,600	6,400	6,400	...
3/ 1	57,600	32,000	12,800	...	...	
3/ 8	290,928	238,032	158,688	...	19,200	
3/15	44,800	211,584	52,896	...	9,600	
3/23	38,400	555,408	211,584	1,600	79,344	
3/29	28,800	264,480	79,344	132,240	158,688	
4/ 5	3,200	264,480	1,600	79,344	19,200	
4/13	3,200	105,792	1,600	79,344	28,800	
4/19	...	793,440	1,600	185,136	105,792	
4/26	...	132,240	1,600	3,200	41,600	
5/ 3	1,600	6,400	...	1,600	79,344	
5/10	6,400	...	...	3,200	44,800	
5/17	...	38,400	...	105,792	3,200	
5/24	...	...	...	3,200	12,800	
5/31	12,800	12,800	...	105,792	38,400	...
6/ 7	...	38,400	...	105,792	...	12,800
6/16	...	32,000	6,400	3,200	158,688	...
6/21	6,400	211,584	9,600	158,688	9,600	
6/28	57,600	238,032	79,344	1,600	...	...
7/ 5	3,200	555,408	...	185,136	12,800	6,400
7/12	9,600	1,798,464	...	423,168	3,200	...
7/19	...	634,752	...	211,584	57,600	
7/26	...	25,600	6,400	...	12,800	...

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Filinia longiseta	Keratella cochlearis	Keratella egg, attached	Keratella egg, free	Keratella quadrata	Lecane luna
8/2		158,688		3,200	12,800	
8/9					12,800	
8/15					38,400	
8/23					12,800	
8/31					64,000	
9/6		211,584	12,800		25,000	
9/13		38,400				
9/20		25,600				
9/27					12,800	12,800
10/4			105,792		211,584	
10/11		12,800	25,600		128,000	
10/18		1,269,504	105,792		528,960	
10/26	105,792	2,115,840	317,376	211,584	25,600	
11/1		2,486,112	793,440	211,584	51,200	
11/8		846,336	528,960	317,376	52,896	
11/15		476,064	12,800	6,400		
11/22		449,616	185,136	52,896	6,400	
11/30		211,584	52,896	1,600	52,896	
12/6		12,800	6,400	3,200	3,200	
12/14	3,200	3,200	6,400	1,600	25,600	
12/20		6,400	6,400	52,896	3,200	
12/27			3,200		6,400	

1913	Notholca striata	Polyarthra trigla	Polyarthra trigla egg, attached female	Polyarthra trigla egg, attached male	Synchaeta sp.	Trichocerca capucina
1/5		800				
1/12		2,400			400	
1/19	400	1,200			400	
1/25	1,200	2,000				
2/2	1,600	12,800			3,200	3,200
2/8		57,600				
2/15	3,200	19,200				
2/23	3,200	6,400			9,600	
3/1		12,800	3,200		3,200	
3/8		105,792			3,200	
3/15	3,200	3,200			3,200	
3/23	3,200	12,800			19,200	
3/29		16,000			16,000	
4/5	16,000	6,400				
4/13		6,400	3,200			
4/19					9,600	
4/26		79,344			9,600	
5/3	1,600	6,400				
5/10		86,400				
5/17						
5/24		158,688				
5/31		12,800				
6/7	12,800					
6/16						
6/21		25,600				
6/28		105,792			32,000	3,200
7/5		3,200			16,000	3,200
7/12	6,400	79,344			132,240	
7/19		19,200			25,600	
7/26		32,000			6,400	
8/2						
8/9		6,400			6,400	
8/15	6,400	3,200			6,400	
8/23		105,792			6,400	
8/31		12,800			12,800	

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Notholca striata	Polyarthra trigla	Polyarthra trigla egg, attached female	Polyarthra trigla egg, attached male	Synchaeta sp.	Trichocerca capucina
9/ 6	.....	317,376	.....	.....	.....	
9/13	.....	51,200	.....	.....	.....	.....
9/20	12,800	38,400	.....	.....	.....	12,800
9/27	.....	12,800	12,800	.....	12,800	.....
10/ 4	.....	25,600	.....	.....	.....	.....
10/11	.....	.....	.....	.....	.....	12,800
10/18	12,800	76,800	.....	211,584	115,200	211,584
10/26	.....	25,600	.....	.....	320,000	.....
11/ 1	.....	.....	.....	.....	264,480	.....
11/ 8	.....	.....	.....	.....	317,376	.....
11/15	.....	.....	.....	.....	51,200	
11/22	3,200	52,896	.....	.....	52,896	
11/30	.....	25,600	.....	.....	22,400	
12/ 6	.....	41,600	.....	.....	79,344	
12/14	.....	105,792	3,200	.....	79,344	
12/20	.....	52,896	.....	1,600	105,792	
12/27	.....	3,200	.....	.....	79,344	1,600

1913	Trichocerca iernis	Trichotria curta	Total Ploima	Total Rotifera	Bosmina longirostris	Bosmina sp.
1/ 5	.....	.....	5,200	7,200		
1/12	.....	.....	15,600	20,000		
1/19	.....	.....	27,436	81,532	.....	
1/25	.....	.....	45,060	80,308	800	
2/ 2	.....	.....	73,600	197,392	.....	
2/ 8	.....	.....	308,240	385,040		
2/15	.....	.....	516,816	532,816		
2/23	.....	.....	380,144	472,288		
3/ 1	.....	.....	168,000	201,600		
3/ 8	.....	.....	937,632	1,070,528	.....	.....
3/15	.....	.....	737,152	826,096		
3/23	.....	.....	1,022,432	1,210,768	.....	.....
3/29	.....	.....	733,952	769,552	.....	.....
4/ 5	.....	.....	403,024	419,024	.....	6,400
4/13	.....	.....	286,032	287,232	.....	3,200
4/19	.....	.....	1,106,768	1,113,168	.....	.....
4/26	.....	.....	293,184	293,184	.....	1,600
5/ 3	.....	.....	100,144	100,144	3,200	.....
5/10	.....	.....	147,200	169,600	.....	
5/17	.....	.....	150,592	156,992	.....	
5/24	.....	.....	200,888	206,688	.....	.....
5/31	.....	.....	182,592	195,392	.....	
6/ 7	.....	.....	208,192	220,992	.....	
6/16	.....	.....	277,088	277,088		
6/21	.....	.....	464,672	467,872		
6/28	.....	.....	687,168	690,368		
7/ 5	12,800	3,200	1,002,480	1,005,024		
7/12	79,344	.....	3,573,584	3,578,384	3,200	
7/19	12,800	.....	1,297,728	1,297,728	6,400	
7/26	105,792	.....	560,768	567,168		
8/ 2	38,400	.....	1,213,216	1,387,904	6,400	
8/ 9	19,200	6,400	579,968	579,968		
8/15	44,800	.....	1,378,112	1,690,400	38,400	
8/23	158,688	.....	782,052	1,201,828		
8/31	105,792	.....	1,573,312	1,810,496	12,800	
9/ 6	.....	.....	1,067,328	1,067,328	.....	
9/13	76,800	.....	1,441,920	1,518,720	76,800	
9/20	211,584	.....	903,552	1,179,136	51,200	
9/27	128,000	.....	685,184	842,176	25,600	
10/ 4	64,000	.....	794,368	1,220,160	12,800	.....

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913—(*Continued*)

1913	Trichocerca iernis	Trichotria curta	Total Ploima	Total Rotifera	Bosmina longirostris	Bosmina sp.
10/11	64,000	....	637,376	893,376	....	....
10/18		....	2,830,016	3,422,976	....	....
10/26		....	3,185,792	3,515,968	....	....
11/1	....	....	3,949,312	3,981,312	6,400	....
11/8	....	....	2,168,736	2,194,336	....	....
11/15	....	....	565,664	629,664	6,400	....
11/22	....	....	811,040	817,440	....	....
11/30	....	....	427,872	427,872	....	....
12/6	....	....	154,544	164,144	3,200	....
12/14	....		239,536	245,936	....	....
12/20	....	....	159,440	165,840	....	....
12/27	....	....	98,544	101,744	6,400	....

1913	Chydorus sp.	Sida sp.	Total Cladocera	Canthocamptus sp.	Cyclops sp.	Nauplius sp.
1/5	....	....	....	....	....	....
1/12	....	....	....	....	....	400
1/19	....	....	400	....	400	800
1/25	....	....	1,200	....	800	2,800
2/2	....	....	....	....	....	9,600
2/8	....	....	....	....	....	3,200
2/15	....	....	....	....	....	....
2/23	....	....	....	....	....	3,200
3/1	....	....	....	....	....	....
3/8	....	....	....	....	....	....
3/15	....	....	....	....	....	....
3/23	....	....	....	....	....	....
3/29	....	....	....	....	....	1,600
4/5	....	....	6,400	....	....	1,600
4/13	....	....	3,200	....	....	....
4/19	....	....	....	....	....	....
4/26	....	....	1,600	3,200	....	....
5/3	....	....	3,200	....	....	3,200
5/10	....	....	....	....	....	....
5/17	....	....	....	....	....	....
5/24	....	....	....	....	....	12,800
5/31	....	....	....	....	....	25,600
6/7	....	....	....	....	....	....
6/16	....	....	....	....	....	....
6/21	....	....	....	....	....	3,200
6/28	....	....	....	....	3,200	....
7/5	....	....	....	....	....	3,200
7/12	....	....	3,200	....	3,200	6,400
7/19	....	....	6,400	....	12,800	6,400
7/26	....	....	....	....	....	....
8/2	....	....	6,400	....	19,200	6,400
8/9	....	....	....	....	6,400	6,400
8/15	6,400	....	44,800	....	6,400	6,400
8/23	12,800	....	12,800	6,400	6,400	6,400
8/31	....	25,600	38,400	....	12,800	12,800
9/6	....	....	....	....	....	211,584
9/13	12,800	12,800	102,400	....	25,600	105,792
9/20	12,800	....	51,200	....	....	105,792
9/27	25,600	....	51,200	....	....	....
10/4	....	....	12,800	....	....	....
10/11	....	....	....	....	12,800	25,600
10/18	12,800	....	12,800	....	....	38,400
10/26	....	....	....	12,800	....	....
11/1	....	....	6,400	....	....	....
11/8	....	....	....	....	....	....
11/15	....	....	6,400	....	....	....

TABLE 2.—ORGANISMS PER CUBIC METER IN PLANKTON OF SAN JOAQUIN RIVER IN 1913—(*Continued*)

1913	Chydorus sp.	Sida sp.	Total Cladocera	Canthocamptus sp.	Cyclops sp.	Nauplius sp.
11/22						
11/30					6,400	
12/ 6	3,200		6,400			
12/14						
12/20						
12/27			6,400			

1913	Total Copepoda	Total Entomostraca	Chironomus larva	Glochidia	Insect larva	Macrobiotus sp.
1/ 5						
1/12	400	400				400
1/19	1,200	1,600				
1/25	3,600	5,200		400	400	2,400
2/ 2	9,600	9,600				
2/ 8	3,200	3,200				
2/15				3,200		
2/23	3,200	3,200				3,200
3/ 1				3,200		
3/ 8	3,200	3,200				3,200
3/15						3,200
3/23						
3/29	1,600	1,600				
4/ 5	4,800	11,200				6,400
4/13		3,200				3,200
4/19						3,200
4/26	3,200	4,800				3,200
5/ 3	3,200	6,400				6,400
5/10						
5/17						6,400
5/24	12,800	12,800			6,400	
5/31	25,600	25,600		12,800		
6/ 7						
6/16				12,800		
6/21	3,200	3,200		6,400		
6/28	3,200	3,200		6,400		
7/ 5	3,200	3,200		16,000		
7/12	9,600	12,800		28,800		
7/19	19,200	25,600		32,000		
7/26						
8/ 2	25,600	32,000		105,792		
8/ 9	12,800	12,800				
8/15	12,800	57,600				
8/23	19,200	32,000				
8/31	25,600	64,000				
9/ 6	211,584	211,584		105,792		
9/13	131,792	233,792				
9/20	118,592	169,792				
9/27		51,200				
10/ 4		12,800				
10/11	38,400	38,400				
10/18	38,400	51,200				
10/26	12,800	12,800	105,792			
11/ 1		6,400				
11/ 8						
11/15		6,400				
11/22	3,200	3,200				
11/30	6,400	6,400				
12/ 6		6,400				
12/14						
12/20						
12/27		6,400	3,200			3,200

Table 2.—Organisms Per Cubic Meter in Plankton of San Joaquin River in 1913—(*Concluded*)

1913	Nematoda sp.	Oligochaete sp.	Water mite	Total Miscellaneous	Total Organisms
1/5					5,821,536
1/12				400	2,299,404
1/19		400		400	13,356,680
1/25		1,200		4,400	3,751,684
2/2					13,983,312
2/8		3,200		3,200	16,816,012
2/15				3,200	8,672,576
2/23				3,200	10,530,652
3/1				3,200	14,529,728
3/8				3,200	13,204,020
3/15				3,200	12,502,272
3/23	3,200			3,200	12,027,616
3/29					18,115,104
4/5				6,400	6,880,048
4/13				3,200	10,023,664
4/19				3,200	16,330,872
4/26				3,200	12,421,328
5/3				6,400	8,507,964
5/10					10,896,192
5/17	6,400		12,800	25,600	17,784,480
5/24				12,800	13,031,040
5/31				12,800	25,877,192
6/7					26,220,984
6/16				12,800	18,035,072
6/21				6,400	21,395,760
6/28			3,200	9,600	32,071,398
7/5				16,000	16,780,444
7/12				28,800	34,980,772
7/19				32,000	61,889,064
7/26					61,589,888
8/2				105,792	117,439,648
8/9					103,235,586
8/15					105,448,076
8/23					217,550,950
8/31					201,760,892
9/6				105,792	229,022,312
9/13				12,800	151,795,800
9/20					141,406,360
9/27					93,592,016
10/4					96,256,744
10/11					150,741,918
10/18					88,902,832
10/26				105,792	63,576,626
11/1					34,666,400
11/8					17,158,816
11/15					13,933,184
11/22					14,814,640
11/30					23,213,808
12/6					17,005,776
12/14					9,575,208
12/20					7,518,192
12/27				6,400	6,370,776

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913

1913	Spirillum undula	Total Bacteriaceae	Anabaena sp.	Aphanocapsa sp.	Coelosphaerium kützingianum	Gloeocapsa conglomerata
1/11						
1/19						
1/25						
2/ 2	1,600	1,600				
2/ 8						
2/15						
2/23						
3/ 1			1,600			
3/ 8						
3/15						
3/23			1,600			
3/29						
4/ 5						
4/13			3,200			
4/19						
4/26			3,200			
5/ 3			6,400			
5/10			3,200		3,200	
5/17			16,000			
5/24						
5/31			1,600			
6/ 7			3,200	105,792		
6/16			9,600	3,200		
6/21	1,600	1,600	28,800	79,344		
6/28			476,064	185,136		
7/ 5			3,200	52,896		
7/12	1,600	1,600	2,036,496	264,480		185,136
7/19			4,601,952	105,792		
7/26			4,125,888	264,480		105,792
8/ 2			793,440	423,168		6,400
8/ 9			2,697,696	1,163,712		158,688
8/15						
8/23	3,200	3,200	1,586,880	158,688	3,200	
8/31			1,481,088			105,792
9/ 6	105,792	105,792	2,539,008			
9/13			1 692,672	211,584		
9/20				528,960		
9/27			12,800	12,800		
10/ 4			12,800	12,800		
10/11				211,584		
10/18			12,800			
10/26				6,400		
11/ 1			52,896		105,792	
11/ 8						
11/15	1,600	1,600				
11/22						
11/30						
12/ 6						
12/14	1,600	1,600	132,240			
12/20						
12/27						

1913	Gloeocapsa sp.	Gomphosphaera aponina	Inactis tinctoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.
1/11						
1/19						
1/25						
2/ 2						
2/ 8		3,200				
2/15		3,200				

Table 3.—Organisms per Cubic Meter in Plankton of Smith's Canal in 1913—(*Continued*)

1913	Gloeocapsa sp.	Gomphosphaera aponina	Inactis tinctoria Agardh	Merismopedium glaucum	Microcystis sp.	Nostoc sp.
2/23	...	3,200	...	...	...	...
3/1	...	1,600	...	...	...	...
3/8	...	1,600	...	...	...	...
3/15	1,600	3,200	...	...	...	...
3/23	79,344	...	...	...	...	...
3/29	52,896	...	...	...	...	...
4/5	...	...	...	...	...	...
4/13	...	1,600	...	...	1,600	...
4/19	...	...	...	...	...	3,200
4/26	1,600	158,688	...	...	...	...
5/3	52,896	...	...	...	...	...
5/10	1,600	...	...	...	...	...
5/17	...		...	...	...	...
5/24	1,600	...	...	...	...	
5/31	1,600	...	...	...	...	...
6/7	1,600	6,400	...	...	...	...
6/16	...	...	...	...	...	16,000
6/21	1,600	...	...	...	3,200	6,400
6/28	1,600	...	...	...	...	304,384
7/5	1,600	...	...	...	158,688	2,062,944
7/12	290,928	52,896	...	...	264,480	581,856
7/19	211,584	...	...	...	211,584	1,110,816
7/26	846,336	3,200	...	...	370,272	687,648
8/2	476,064	...	...	...	211,584	1,216,608
8/9	1,269,504	105,792	...	...	211,584	1,322,400
8/15	317,376	...		...	...	
8/23	581,856	...	1,163,712	...	32,000	6,876,480
8/31	317,376	...	6,030,144	...	12,800	3,491,136
9/6	423,168	...	7,934,400	12,800	12,800	740,544
9/13	1,057,920	76,800	952,128	...	64,000	1,057,920
9/20	952,128	317,376	1,586,880	...	12,800	2,644,800
9/27	740,544	...	11,319,744	...	25,600	634,752
10/4	740,544	...	423,168	...	317,376	317,376
10/11	317,376	...	528,960	...	211,584	317,376
10/18	...	...	317,376	...	25,600	...
10/26	6,400	...	...	...	6,400	6,400
11/1	52,896	...	...	...	6,400	12,800
11/8	158,688	...	52,896	52,896	...	12,800
11/15	105,792	...	...	132,240	52,896	...
11/22	52,896	...	...	52,896	12,800	...
11/30	52,896	...	...	105,792	...	...
12/6	79,344	...	...	...	...	...
12/14	1,600	...	...	...	...	
12/20	133,840	...	...	...	...	...
12/27	...	...	...	...	...	...

1913	Oscillatoria formosa	Oscillatoria sp.	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae
1/11	400	...	...	...	...	400
1/19	...	...	...	3,200	...	3,200
1/25	...	...	400	66,120	...	66,520
2/2	...	...	...	1,600	...	1,600
2/8	...	...	1,600	3,200	...	7,000
2/15	...	...	79,344	52,896	...	135,440
2/23	...	...	...	185,136	...	188,336
3/1				1,600	...	4,800
3/8	...	...	...	...	...	1,600
3/15	...	...	52,896	52,896	...	110,592
3/23	...	...	...	79,344	...	150,288
3/29	52,896	...	...	317,376	...	476,064

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Oscillatoria formosa	Oscillatoria sp.	Oscillatoria tenuis	Phormidium spp.	Stigonema sp.	Total Schizophyceae
4/ 5	3,200	....	3,200	79,344	....	250,832
4/13	....	....	1,600	132,240	....	140,240
4/19	....	....	1,600	105,792	....	110,592
4/26	....	....	....	....	....	163,488
5/ 3	....	....	3,200	3,200	....	68,696
5/10	....	....	....	1,600	....	9,600
5/17	....	....	....	52,896	16,000	84,896
5/24	....	....	....	....	....	1,600
5/31	....	....	....	....		3,200
6/ 7	6,400	....	....	....	....	123,392
6/16	9,600	3,200	....	79,344		120,944
6/21	9,600	....	....	1,600	1,600	132,144
6/28	....	....	....	1,600	1,600	758,800
7/ 5	....	....	1,600	....	1,600	2,130,240
7/12	1,600	1,600	3,200	....	52,896	3,735,568
7/19	3,200	317,376	....	....	....	6,562,304
7/26	....	370,272	....	....	6,400	6,780,294
8/ 2	....	317,376	....	....		2,651,200
8/ 9	6,400	687,648	....	....	158,688	7,623,424
8/15	....					323,726
8/23		211,584	3,200	476,064		11,252,352
8/31		317,376	....	1,798,464		13,554,174
9/ 6	....		....	....		11,662,720
9/13	....	105,792	....	....	....	5,218,716
9/20	....	....	....	317,376	211,584	6,571,904
9/27		105,792	....	528,960	....	13,380,992
10/ 4			....	....		1,824,064
10/11	....		....			1,599,680
10/18	....		....			355,776
10/26	....		....	....		25,600
11/ 1	....			....		230,784
11/ 8	6,400		....			283,680
11/15	3,200	1,600	....	....		295,728
11/22	....	....	3,200	52,896		174,688
11/30	....					158,688
12/ 6	....	52,896				132,240
12/14	....	1,600				135,440
12/20	9,600	....				9,600
12/27	....	52,896				52,896

1913	Actinastrum hantzschii	Actinastrum hantzschii (large)	Coelastrum microporum	Crucigenia lauterbornii	Pediastrum boryanum	Pediastrum duplex
1/11	....	....	....	....	400	400
1/19	....	....			6,400	
1/25	....				6,400	7,200
2/ 2	....				19,200	79,344
2/ 8	....	....	....	....	32,000	9,600
2/15	....	....	....	....	51,200	79,344
2/23	3,200	....	....	....	38,400	132,240
3/ 1	1,600	....	....	....	105,792	9,600
3/ 8	1,600	....	....	....	158,688	6,400
3/15	105,792	....	....	....	79,344	79,344
3/23	9,600	....	....	....	158,688	132,240
3/29	158,688	....	....	....	132,240	132,240
4/ 5	3,200	....	....	....	158,688	158,688
4/13	52,896	....	....	....	12,800	105,792
4/19	1,600	....	....	....	105,792	22,400
4/26	105,792	26,448	....	....	79,344	105,792
5/ 3	....	9,600	....	....	132,240	79,344
5/10	6,400	....	....	....	22,400	12,800

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Actinastrum hantzschii	Actinastrum hantzschii (large)	Coelastrum microporum	Crucigenia lauterbornii	Pediastrum boryanum	Pediastrum duplex
5/17					9,600	12,800
5/24	1,600				9,600	1,600
5/31					52,896	6,400
6/7					19,200	25,600
6/16	6,400	1,600				105,792
6/21	158,688	3,200			9,600	22,400
6/28	185,136	1,600			79,344	211,584
7/5	9,600	79,344				396,720
7/12	52,896	79,344			158,688	925,680
7/19		528,960			19,200	1,851,360
7/26	19,200	423,168	3,200		211,584	1,481,088
8/2	6,400	264,480				1,692,672
8/9		317,376			19,200	1,375,296
8/15					158,688	581,856
8/23	105,792	793,440	158,688		105,792	2,221,632
8/31		3,067,968	423,168		105,792	1,163,712
9/6	634,752	211,584	528,960	528,960	211,584	2,433,216
9/13		211,584	1,057,920			3,596,928
9/20	105,792	211,584	528,960		105,792	4,241,680
9/27		952,128	211,584	12,800	211,584	2,962,176
10/4	423,168	1,481,088	105,792	105,792	51,200	4,559,056
10/11		1,481,088	25,600		211,584	4,770,640
10/18		317,376		105,792	317,376	2,539,008
10/26	6,400	264,480			19,200	1,639,776
11/1		105,792	6,400		211,584	1,533,984
11/8	6,400	52,896	52,896		6,400	634,752
11/15	1,600				52,896	132,240
11/22	3,200	79,344			9,600	185,136
11/30	3,200	6,400	1,600		6,400	105,792
12/6		3,200			3,200	52,896
12/14						52,896
12/20						9,600
12/27					3,200	52,896

1913	Pediastrum simplex	Raphidium polymorphum	Richteriella botryoides	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera
1/11					400	
1/19					3,200	
1/25					400	
2/2					1,600	
2/8	3,200				3,200	
2/15	1,600				105,792	
2/23					79,344	1,600
3/1	6,400				6,400	
3/8	3,200				132,240	
3/15	3,200		1,600	1,600	9,600	
3/23	52,896	1,600		1,600	132,240	
3/29	1,600	132,240			290,928	
4/5	1,600			3,200	105,792	
4/13		1,600			158,688	1,600
4/19		1,600		52,896	132,240	
4/26	52,896	1,600		1,600	105,792	
5/3		54,496		105,792	6,400	
5/10	1,600	79,344			3,200	
5/17		3,200		1,600		
5/24	3,200				3,200	
5/31				52,896	6,400	
6/7				3,200	132,240	
6/16					3,200	
6/21	3,200			3,200	9,600	

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Pediastrum simplex	Raphidium polymorphum	Richteriella botryoides	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera
6/28	1,600			3,200	264,480	
7/ 5		1,600		3,200	105,792	
7/12	52,896	1,600		3,200	290,928	
7/19	32,000	3,200			158,688	
7/26	6,400	3,200		105,792	317,376	3,200
8/ 2	105,792	3,200			476,064	
8/ 9	105,792	3,200		3,200	370,272	
8/15	105,792				899,232	
8/23	158,688	370,272	105,792	158,688	528,960	
8/31	105,792	317,376		12,800	846,336	
9/ 6	528,960		952,128	423,168	1,163,712	
9/13	12,800	211,584	25,600	211,584	528,960	
9/20	211,584		317,376	105,792	846,336	
9/27	25,600	224,384		423,168	1,269,504	
10/ 4	12,800	211,584		105,792	2,115,840	
10/11	211,584	105,792		423,168	1,692,672	211,584
10/18				211,584	846,336	52,896
10/26	12,800	52,896		317,376	1,110,816	
11/ 1	6,400	52,896		211,584	1,216,608	
11/ 8		211,584		158,688	846,336	
11/15		132,240		105,792	687,648	
11/22	3,200	1,600		3,200	290,928	1,600
11/30	1,600	79,344		1,600	158,688	
12/ 6		1,600			6,400	
12/14				3,200	3,200	
12/20				1,600	1,600	
12/27	1,600	132,240			52,896	

1913	Total Chlorophyceae	Asterionella gracillima	Asterionella gracillima (large)	Amphiprora alata	Amphora coffaeformis	Bacillaria paradoxa
1/11	1,200	773,604				2,000
1/19	9,600	6,083,040	1,600			4,800
1/25	14,000	3,153,924				
2/ 2	100,144	5,183,808	1,600			4,800
2/ 8	48,000	9,997,344				
2/15	237,936	2,062,944		1,600		6,400
2/23	257,984	2,644,800				
3/ 1	129,792	1,666,224				3,200
3/ 8	302,128	1,481,088		132,240		3,200
3/15	280,480	1,295,952	26,448			25,600
3/23	388,864	1,137,264	79,344	3,200		6,400
3/29	795.040	3,702,720	158,688	1,600		132,240
4/ 5	431,168	211,584		238.032		158,688
4/13	174,688	793,440	132,240	1,600		105,792
4/19	316,528	343,824	52,896	52,896		132,240
4/26	479,264	581,856	105,792			185,136
5/ 3	389,472	28,800				41,600
5/10	125,744	3,623,376				9,600
5/17	27,200	608.304	502 512	3,200		12,800
5/24	19,200	185,136				3,200
5/31	118,592	105,792				
6/ 7	180,240	819,888	1,031,472			16,000
6/16	116,992	2,353,872	2,803,488			12 800
6/21	211.584	3,067,968	3,120,864			6,400
6/28	746,944	899,232	502,512	1,600		38,400
7/ 5	597,856	238,032		1,600		12.800
7/12	1,644,576		1,600	105,792		1,428,192
7/19	2,593,408					1,904,256
7/26	2,577,408					5,183,808
8/ 2	2,548,508					4,760,640

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Total Chlorophyceae	Asterionella gracillima	Asterionella gracillima (large)	Amphiprora alata	Amphora coffaeformis	Bacillaria paradoxa
8/9	2,194,336	...	...	...	12,800	14,493,504
8/15	2,168,736	...	...	211,584	...	3,200
8/23	4,562,256	3,200	...	...	...	2,062,944
8/31	6,042,944	...	...	...	...	1,057,920
9/6	7,606,924	...	...	...	...	423,168
9/13	6,068,548	...	...	105,792	...	1,798,464
9/20	6,674,876	...	...	...	...	6,241,728
9/27	6,292,928	...	...	...	...	2,221,632
10/4	9,222,112	...	...	...	...	2,327,424
10/11	9,133,712	...	...	105,792	...	740,544
10/18	4,337,472	...	...	105,792	...	423,168
10/26	3,466,640	52,896	...	...	...	211,584
11/1	3,355,248	...	6,400	...	...	105,792
11/8	1,811,264	6,400	52,896	...	...	102,400
11/15	1,112,416	22,400	158,688	...	...	28,800
11/22	579,408	79 344	185,136	...	...	370,272
11/30	364,624	1,600	1,600	...	...	290,928
12/6	67,296	5,316,048	...	1,600	...	1,613,328
12/14	59,296	1,877,808	634,752	...	1,600	740,544
12/20	12,800	238,032	...	...	...	502,512
12/27	242,832	158,688	...	...	...	264,480

1913	Cocconeis pediculus	Cocconeis sp.	Cyclotella spp.	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis
1/11	...	...	146,264	...	...	...
1/19	...	...	1,560,432	...	...	...
1/25	...	...	958,740	...	...	1,600
2/2	...	...	1,137,264	1,600	...	...
2/8	...	...	1,481,088	...	...	...
2/15	...	...	1,798,464	...	...	22,400
2/23	...	...	6,506,208	...	...	...
3/1	1,600	1,600	16,794,480	6,400	12,800	52,896
3/8	...	...	6,109,488	6,400	...	...
3/15	...	...	4,839,984	3,200	...	6,400
3/23	...	...	3,491,136	3,200	...	...
3/29	1,600	...	4,496,160	9,600	52,896	9,600
4/5	...	...	1,322,400	3,200	1,600	6,400
4/13	...	52,896	1,745,568	12,800	3,200	...
4/19	...	...	3,358,896	6,400	...	3,200
4/26	...	...	2,062,944	...	105,792	...
5/3	...	...	3,782,064	...	1,600	...
5/10	1,600	...	1,533,984	...	52,896	...
5/17	...	...	2,248,080	3,200	1,600	3,200
5/24	...	...	899,232	...	3,200	3,200
5/31	...	...	581,856	...	...	...
6/7	...	...	819,888	...	3,200	...
6/16	...	...	1,295,952	3,200	3,200	...
6/21	...	...	1,560,432	...	1,600	3,200
6/28	...	...	3,649,824	3,200	1,600	...
7/5	...	...	3,226,656	...	1,600	...
7/12	...	...	5,316,048	...	3,200	...
7/19	...	...	7,405,440	...	...	...
7/26	...	...	8,410,464	19,200	...	6,400
8/2	...	...	10,367,616	...	...	...
8/9	...	...	6,823,584	3,200	...	6,400
8/15	...	...	7,669,920	6,400	...	...
8/23	3,200	...	13,594,272	25,600	...	...
8/31	...	...	14,281,920	...	...	12,800
9/6	...	...	12,906,624	25,600	...	25,600

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Cocconeis pediculus	Cocconeis sp.	Cyclotella spp.	Cymatopleura solea	Cymbella affinis	Cymbella cymbiformis
9/13			9,521,292	12,800		
9/20			15,128,256			12,800
9/27			17,773,056			
10/ 4			22,765,328			
10/11			22,342,160		105,792	
10/18	105,792		24,667,584			
10/26			39,407,520	6,400	52,896	
11/ 1			13,488,480	6,400		6,400
11/ 8			6,559,104		6,400	12,800
11/15			2,697,696			3,200
11/22	1,600		2,540,608		1,600	12,800
11/30			2,196,784		1,600	3,200
12/ 6			2,327,424	6,400	52,896	
12/14			1,297,552	6,400		
12/20			1,533,984	12,800		6,400
12/27			1,719,120		52,896	

1913	Cymbella pusilla	Cymbella prostrata	Cymbella sp.	Cymbella tumida	Diatom unidentified	Epithemia ocellata
1/11			800			
1/19						
1/25						
2/ 2			1,600		3,200	
2/ 8						
2/15	1,600				79,344	
2/23	1,600		1,600			
3/ 1			3,200		3,200	3,200
3/ 8				3,200	52,896	3,200
3/15	1,600			6,400		
3/23						
3/29					52,896	
4/ 5				3,200	1,600	
4/13					1,600	3,200
4/19						
4/26				1,600		52,896
5/ 3				3,200	79,344	
5/10			1,600	9,600		
5/17				3,200		
5/24						
5/31						
6/ 7				3,200		3,200
6/16		3,200				6,400
6/21		3,200		6,400		9,600
6/28				1,600		3,200
7/ 5				1,600		
7/12				52,896		3,200
7/19				6,400		
7/26				12,800		12,800
8/ 2						
8/ 9				6,400		
8/15				6,400		
8/23						12,800
8/31				12,800		
9/ 6				12,800		12,800
9/13						
9/20						
9/27						
10/ 4						12,800
10/11						

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Cymbella pusilla	Cymbella prostrata	Cymbella sp.	Cymbella tumida	Diatom unidentified	Epithemia ocellata
10/18				12,800		
10/26						
11/ 1						6,400
11/ 8				6,400		
11/15						
11/22				1,600		6,400
11/30						1,600
12/ 6				6,400		9,600
12/14						
12/20						6,400
12/27						6,400

1913	Eunotia flexuosa	Eunotia sp.	Fragillaria capucina	Fragillaria crotonensis	Fragillaria sp.	Gomphonema constrictum
1/11			1,200		400	
1/19			9,600			
1/25			19,836			
2/ 2			9,600			
2/ 8			6,400			
2/15			52,896			
2/23			16,000	3,200		
3/ 1			9,600			
3/ 8			79,344		3,200	
3/15			79,344			
3/23			22,400			
3/29			185,136			
4/ 5			79,344			
4/13			79,344			
4/19			6,400			
4/26			158,688			3,200
5/ 3			9,600			
5/10			12,800			
5/17			12,800			
5/24			19,200			1,600
5/31			1,600			
6/ 7			3,200		1,600	1,600
6/16			28,800			1,600
6/21			105,792			1,600
6/28			3,200			
7/ 5			9,600			
7/12			3,200		1,600	
7/19			6,400			
7/26			6,400			
8/ 2						
8/ 9			6,400			3,200
8/15					6,400	
8/23						
8/31						
9/ 6				105,792		
9/13			12,800	105,792		
9/20				105,792		
9/27			105,792			
10/ 4		105,792	12,800			
10/11				12,800		
10/18						
10/26			52,896	6,400		
11/ 1		52,896	52,896	52,896		
11/ 8				6,400		
11/15		1,600	9,600			

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Eunotia flexuosa	Eunotia sp.	Fragillaria capucina	Fragillaria crotonensis	Fragillaria sp.	Gomphonema constrictum
11/22			6,400	3,200		
11/30						1,600
12/ 6			3,200		1,600	
12/14	1,600					
12/20	6,400					
12/27		1,600	3,200			

1913	Gomphonema olivaceum	Gomphonema sp.	Gomphonema subclavatum	Gyrosigma acuminatum	Gyrosigma kützingii	Gyrosigma scalproides
1/11					400	
1/19					3,200	
1/25					800	
2/ 2					6,400	
2/ 8					6,400	
2/15					105,792	
2/23				3,200	3,200	
3/ 1				52,896	105,792	
3/ 8						
3/15					3,200	1,600
3/23					3,200	132,240
3/29				1,600	132,240	1,600
4/ 5		1,600			79,344	
4/13					9,600	
4/19					79,344	1,600
4/26					6,400	
5/ 3					3,200	
5/10					3,200	
5/17		1,600			1,600	1,600
5/24					12,800	3,200
5/31						
6/ 7	1,600				12,800	52,896
6/16					12,800	
6/21					9,600	1,600
6/28					12,800	1,600
7/ 5				1,600	3,200	
7/12					105,792	
7/19					32,000	
7/26					476,064	6,400
8/ 2					158,688	317,376
8/ 9					211,584	1,481,088
8/15				211,584	105,792	1,005,024
8/23	3,200			105,792	370,272	2,697,696
8/31				211,584	317,376	1,586,880
9/ 6				105,792	423,168	740,544
9/13					211,584	317,376
9/20				317,376	105,792	317,376
9/27					12,800	211,584
10/ 4			12,800		105,792	317,376
10/11			105,792		38,400	211,584
10/18			105,792			105,792
10/26				105,792	12,800	423,168
11/ 1						6,400
11/ 8					105,792	158,688
11/15					6,400	79,344
11/22					52,896	132,240
11/30				9,600	6,400	3,200
12/ 6					52,896	52,896
12/14					52,896	
12/20				3,200	6,400	52,896
12/27					3,200	105,792

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Melosira granulata	Melosira granulata A (small)	Melosira varians	Navicula affinis	Navicula alpestris	Navicula bacillum
1/11	....	....	4,800	....	....	....
1/19	1,600	....	211,584	1,600	....	....
1/25	119,016	....	19,836	....	....	....
2/2	449,616	....	9,600	1,600	....	....
2/8	952,128	....	25,600	....	....	....
2/15	899,232	....	264,480	....	....	....
2/23	1,560,432	....	9,600	....	....	....
3/1	687,648	....	264,480	....	1,600	....
3/8	1,084,368	....	105,792	....	....	....
3/15	4,152,336	....	185,136	6,400	105,792	....
3/23	1,877,808	6,321,072	423,168	105,792	105,792	....
3/29	2,353,872	9,045,216	396,720	1,600	132,240	185,136
4/5	872,784	132,240	105,792	....	1,600	....
4/13	5,104,464	740,544	158,688	185,136	79,344	....
4/19	5,765,664	634,752	9,600	1,600	79,344	....
4/26	9,203,904	581,856	238,032	79,344	3,200	79,344
5/3	1,560,432	211,584	79,344	....	....	105,792
5/10	2,010,048	158,688	105,792	....	....	52,896
5/17	3,649,824	105,792	79,344	....	1,600	132,240
5/24	3,279,552	....	19,200	....	52,896	3,200
5/31	1,454,640	1,600	3,200	....	....	3,200
6/7	5,078,016	....	6,400	....	1,600	52,896
6/16	6,426,864	....	79,344	....	1,600	52,896
6/21	8,119,536	....	132,240	....	....	52,896
6/28	14,652,192	....	6,400	....	3,200	1,600
7/5	9,891,552	....	185,136	....	....	52,896
7/12	16,503,552	....	158,688	....	1,600	....
7/19	13,647,168	....	....	....	....	105,792
7/26	24,437,952	....	12,800	....	....	3,200
8/2	34,170,816	....	6,400	....	3,200	105,792
8/9	64,321,536	....	158,688	....	3,200	211,584
8/15	86,643,648	....	211,584	....	....	3,200
8/23	84,845,184	....	105,792	....	105,792	....
8/31	88,971,072	....	....	....	....	....
9/6	193,810,944	....	25,600	....	211,584	105,792
9/13	75,439,744	....	....	....	....	211,584
9/20	127,912,576	....	317,376	....	....	105,792
9/27	72,265,984	....	....	....	....	211,584
10/4	53,214,576	....	105,792	....	105,792	....
10/11	60,524,224	....	12,800	....	211,584	105,792
10/18	27,515,968	....	105,792	....	....	....
10/26	22,057,632	....	6,400	....	105,792	....
11/1	15,445,632	....	6,400	....	....	....
11/8	6,612,000	....	19,200	....	....	105,792
11/15	2,697,696	....	3,200	....	....	1,600
11/22	2,115,840	....	52,896	....	52,896	....
11/30	3,914,304	....	6,400	....	3,200	....
12/6	2,327,424	....	79,344	....	52,896	1,600
12/14	1,507,536	....	52,896	....	....	79,344
12/20	661,200	....	25,600	....	1,600	....
12/27	1,110,816	....	185,136	....	....	52,896

1913	Navicula didyma	Navicula dubia	Navicula gracilis	Navicula sp.	Navicula viridis	Nitzschia acicularis
1/11	....	....	....	....	....	....
1/19	....	....	....	52,896	....	80,944
1/25	....	....	800	....	....	59,508
2/2	....	....	158,688	1,600	4,800	185,136
2/8	3,200	....	158,688	1,600	....	158,688

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Navicula didyma	Navicula dubia	Navicula gracilis	Navicula sp.	Navicula viridis	Nitzschia acicularis
2/15	3,200		264,480	79,344	12,800	132,240
2/23			6,400		3,200	79,344
3/ 1			290,928	105,792	1,600	158,688
3/ 8	1,600		185,136	82,544	3,200	79,344
3/15			290,928	3,200		105,792
3/23	3,200		290,928	1,600		211,584
3/29	1,600		476,064	1,600	1,600	343,824
4/ 5			581,856	4,800	6,400	238,032
4/13			185,136	6,400	3,200	264,480
4/19			238,032	1,600	3,200	264,480
4/26	1,600		608,304	3,200		476,064
5/ 3			105,792		1,600	52,896
5/10			132,240	3,200		105,792
5/17			158,688		3,200	211,584
5/24			211,584		3,200	185,136
5/31						132,240
6/ 7			317,376		3,200	211,584
6/16			370,272	3,200	3,200	846,336
6/21			79,344	6,400		661,200
6/28			185,136			1,005,024
7/ 5			1,600			819,888
7/12	52,896		634,752		3,200	608,304
7/19			105,792			793,440
7/26			1,798,464	3,200	12,800	687,648
8/ 2			740,544			793,440
8/ 9		6,400	2,062,944		12,800	634,752
8/15			49,722,240		6,400	158,688
8/23			3,385,344		6,400	423,168
8/31		105,792	2,644,800			3,067,968
9/ 6			1,904,256			3,385,344
9/13			423,168		12,800	1,269,504
9/20			2,327,424			528,960
9/27			1,375,296		12,800	1,481,088
10/ 4			952,128		25,600	528,960
10/11			1,163,712			211,584
10/18			740,544			211,584
10/26		52,896	317,376			105,792
11/ 1		105,792	52,896			158,688
11/ 8	52,896		158,688		6,400	317,376
11/15			52,896	3,200	6,400	502,512
11/22			185,136		9,600	211,584
11/30	3,200		158,688			290,928
12/ 6			370,272	6,400	52,896	502,512
12/14		1,600	158,688		3,200	132,240
12/20			185,136			79,344
12/27	3,200		317,376		3,200	132,240

1913	Nitzschia angularis	Nitzschia sigma	Nitzschia sigmoidea	Nitzschia vermicularis	Pinnularia acrosphaeria	Pleurostauron parvulum
1/11						39,672
1/19				1,600		317,376
1/25						72,732
2/ 2	9,600			3,200		264,480
2/ 8			1,600	52,896		211,584
2/15	6,400			105,792	9,600	158,688
2/23	3,200			9,600		211,584
3/ 1			9,600	3,200		740,544
3/ 8	3,200	1,600		1,600		290,928
3/15			79,344	6,400		476,064

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Nitzschia angularis	Nitzschia sigma	Nitzschia sigmoidea	Nitzschia vermicularis	Pinnularia acrosphaeria	Pleurostauron parvulum
3/23	3,200		3,200			370,272
3/29	3,200		52,896			423,168
4/5			52,896	3,200		343,824
4/13		12,800				581,856
4/19	6,400	3,200				211,584
4/26		3,200				132,240
5/3		3,200				211,584
5/10						211,584
5/17	3,200	3,200		3,200		
5/24		6,400		6,400		132,240
5/31						
6/7		3,200				1,600
6/16	12,800					158,688
6/21	1,600	1,600	6,400	3,200	1,600	52,896
6/28	3,200			1,600		
7/5				6,400		
7/12	9,600			79,344		52,896
7/19						158,688
7/26	25,600					158,688
8/2		6,400		3,200		3,200
8/9	6,400	264,480				158,688
8/15	105,792	105,792		105,792		105,792
8/23	6,400	211,584		158,688		158,688
8/31		317,376				
9/6		211,584		105,792		
9/13	12,800	211,584		105,792		
9/20		105,792				
9/27		211,584		211,584		105,792
10/4	12,800	105,792		38,400		105,792
10/11	12,800			12,800		
10/18		12,800		12,800		105,792
10/26	12,800				6,400	52,896
11/1		52,896		6,400		52,896
11/8	52,896	12,800				211,584
11/15		1,600				52,896
11/22	3,200	6,400		6,400		1,600
11/30	3,200					105,792
12/6	3,200	52,896				132,240
12/14		52,896				52,896
12/20		9,600				52,896
12/27		3,200		6,400		185,136

1913	Stauroneis phoenicenteron	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium acerosum
1/11		400		26,448	995,988	
1/19		17,600		449,616	8,850,184	
1/25		5,600		469,452	4,882,644	3,200
2/2		65,600		343,824	7,847,616	3,200
2/8		19,200		238,032	13,286,048	1,600
2/15		114,544		343,824	6,526,064	3,200
2/23		94,496		396,720	11,554,384	
3/1		132,240		502,512	21,603,120	
3/8		48,000		290,928	10,066,896	6,400
3/15		158,688		793,440	12,653,248	3,200
3/23		132,240		238,032	15,174,656	
3/29		185,136		476,064	23,028,112	
4/5		132,240		370,272	5,009,024	3,200
4/13	3,200	185,136		528,960	10,329,424	
4/19		79,344		423,168	11,761,264	

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Stauroneis phoenicenteron	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium acerosum
4/26		54,400		185,136	14,915,728	6,400
5/ 3		35,200		6,400	6,323,232	
5/10		105,792		317,376	8,531,408	
5/17		158,688		185,136	8,256,480	
5/24		60,800		105,792	5,198,768	
5/31				1,600	2,285,728	
6/ 7	1,600	132,240		132,240	8,722,096	
6/16	3,200	79,344		238,032	14,880,432	
6/21		211,584		238,032	17,599,024	3,200
6/28		105,792		1,190,160	22,537,552	
7/ 5		132,240		343,824	15,092,112	
7/12		449,616		343,824	26,131,376	6,400
7/19		211,584	105,792	158,688	24,800,128	
7/26		1,428,192	793,440	267,680	43,673,600	12,800
8/ 2		687,648	264,480	211,584	53,816,832	6,400
8/ 9	....	4,125,888	158,688		95,438,688	37,400
8/15	3,200	1,586,880	476,064	370,272	149,512,496	
8/23		2,274,528	1,057,920	158,688	113,258,240	12,800
8/31		1,163,712	528,960	4,125,888	118,406,848	38,400
9/ 6		634,752	423,168	3,808,512	220,996,096	76,800
9/13		211,584	423,168	5,924,364	96,437,784	12,800
9/20		634,752	317,376	2,856,384	157,322,752	25,600
9/27		528,960	1,586,880	2,539,008	99,961,216	
10/ 4		423,168	1,269,504	1,904,256	84,452,672	
10/11		317,376	846,336	2,221,632	89,303,502	12,800
10/18		740,544	634,752	1,692,672	57,291,968	
10/26	....	634,752	158,688	476,064	64,325,240	12,800
11/ 1	....	476,064	158,688	370,272	30,671,584	6,400
11/ 8	52,896	528,960	264,480	528,960	15,042,976	
11/15		52,896	211,584	158,688	6,757,696	3,200
11/22		185,136	52,896	79,344	6,35 ,424	6,400
11/30		158,688	52,896	132,240	7,324,400	3,200
12/ 6	3,200	264,480		290,928	13,506,832	3,200
12/14	....	105,792	....	238,032	7,003,072	3,200
12/20		264,480	132,240	105,792	3,890,112	
12/27		79,344	1,600	185,136	4,581,056	

1913	Closterium acuminatum	Closterium rostratum	Cosmarium sp.	Mougeotia sp.	Spirogyra protecta	Staurastrum A
1/11					1,200	
1/19				1,600	6,400	
1/25				400		
2/ 2					1,600	
2/ 8						....
2/15						1,600
2/23				1,600		79,344
3/ 1						....
3/ 8						185,136
3/15					3,200	6,400
3/23						
3/29						52,896
4/ 5			1,600	1,600	6,400	
4/13	1,600			1,600		
4/19						
4/26						1,600
5/ 3						
5/10					1,600	
5/17				3,200		
5/24						

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Closterium acuminatum	Closterium rostratum	Cosmarium sp.	Mougeotia sp.	Spirogyra protecta	Staurastrum A
5/31	...	...	...	1,600	...	...
6/ 7	...	...	...	9,600	...	...
6/16	6,400	...	...	...	...	...
6/21	...	...	1,600	...	...	...
6/28	...	...	...	...	...	52,896
7/ 5	3,200	...	...	...	...	105,792
7/12	6,400	...	...	238,032	...	132,240
7/19	...	...	...	211,584	...	12,800
7/26	...	...	...	423,168	...	105,792
8/ 2	...	...	...	264,480	...	105,792
8/ 9	6,400	...	...	1,322,400	...	317,376
8/15	...	3,200	...	3,200	...	3,200
8/23	...	105,792	...	3,967,200	...	105,792
8/31	...	12,800	...	4,866,432	...	...
9/ 6	...	...	...	1,586,880	...	211,584
9/13	...	105,792	...	317,376	...	423,168
9/20	...	...	...	105,792	...	3,067,968
9/27	...	...	...	...	...	317,376
10/ 4	...	...	...	105,792	...	423,168
10/11	...	...	...	...	...	528,960
10/18	...	...	...	...	...	25,600
10/26	...	...	...	52,896	...	264,480
11/ 1	...	...	...	...	...	12,800
11/ 8	...	...	...	...	...	...
11/15	...	...	...	211,584	...	...
11/22	...	...	...	52,896	...	3,200
11/30	...	...	...	1,600	...	3,200
12/ 6	...	1,600	...	...	3,200	3,200
12/14	...	...	...	...	3,200	1,600
12/20	...	...	...	...	...	...
12/27	...	...	...	...	6,400	...

1913	Staurastrum sp.	Total Conjugatae	Total Chlorophyll bearing	Total Algae	Ceratium hirundinella	Cercomonas crassicauda
1/11	...	1,200	999,988	998,788	...	...
1/19	...	8,000	9,938,504	8,870,984	...	...
1/25	...	3,600	6,508,748	4,966,764	...	...
2/ 2	...	4,800	9,223,664	7,955,760	...	...
2/ 8	...	1,600	17,480,488	13,342,648	...	...
2/15	...	4,800	10,570,064	6,904,240	...	...
2/23	...	84,144	17,567,024	12,084,848	...	...
3/ 1	...	...	22,767,488	21,737,712	...	...
3/ 8	...	191,536	11,030,128	10,562,160	...	...
3/15	...	12,800	13,969,056	13,057,120	...	...
3/23	...	100,000	17,638,720	15,813,808	...	...
3/29	...	52,896	25,649,664	24,352,112	...	...
4/ 5	...	12,800	5,868,912	5,703,824	...	...
4/13	...	3,200	11,054,624	10,647,552	...	...
4/19	...	...	12,431,216	12,188,384	...	...
4/26	...	8,000	16,141,088	15,566,480	...	...
5/ 3	...	...	7,444,200	6,781,400	...	...
5/10	...	1,600	8,998,528	8,668,352	...	...
5/17	...	3,200	8,540,968	8,371,776	...	...
5/24	...	3,200	5,364,608	5,222,768	...	...
5/31	...	1,600	2,574,208	2,409,120	...	...
6/ 7	...	9,600	9,462,448	9,035,328	...	...
6/16	...	9,600	15,295,408	15,127,968	...	3,200
6/21	...	4,800	18,320,928	17,949,056	...	3,200
6/28	...	52,896	24,406,320	24,096,192	...	3,200

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Staurastrum sp.	Total Conjugatae	Total Chlorophyll bearing	Total Algae	Ceratium hirundinella	Cercomonas crassicauda
7/ 5	......	108,992	19,267,600	17,929,200	......	
7/12	......	383,072	33,831,696	31,896,192	......	......
7/19	211,584	435,968	36,948,320	28,391,808	6,400	
7/26	105,792	652,952	58,738,174	53,684,254	......	......
8/ 2	317,376	694,048	62,336,096	59,710,588	......	
8/ 9	105,792	1,789,368	111,133,112	107,045,816	......	
8/15	......	115,392	161,112,670	152,120,350		
8/23	317,376	4,508,960	138,246,256	133,585,008	......	......
8/31	......	4,917,632	147,390,462	142,921,598	......	105,792
9/ 6	528,960	830,144	247,981,772	241,201,676	......	......
9/13	......	859,136	114,001,764	108,584,184	12,800	
9/20	......	3,199,362	177,590,200	173,768,894	......	......
9/27	105,792	423,168	125,264,912	120,058,304	......	105,792
10/ 4	......	488,960	101,844,780	95,987,808	......	......
10/11	......	554,560	104,095,392	100,591,454		
10/18	211,594	237,184	65,078,784	62,222,400	......	
10/26	......	330,176	70,077,512	68,147,656	52,896	
11/ 1	......	19,200	38,316,112	34,276,816	......	
11/ 8	......	......	22,222,336	17,137,920		
11/15	......	214,784	11,703,204	8,382,224		
11/22	......	62,496	16,219,536	7,168,016		
11/30	......	14,000	11,808,016	7,861,712		
12/ 6	......	9,600	16,429,664	13,715,968		
12/14	......	11,200	10,081,776	7,210,608	......	......
12/20	......	......	6,232,912	3,912,512		
12/27	......	6,400	7,511,136	4,883,184		

1913	Chlamydomonas sp.	Chromulina sp.	Cryptomonas sp.	Dinobryon sertularia	Eudorina elegans	Euglena viridis
1/11	......	......	......	......	1,200	
1/19	......	1,005,024	......	......	8,000	
1/25	......	1,500,924	......	......	3,200	......
2/ 2	......	952,128	......	......	105,792	52,896
2/ 8	52,896	3,782,064	......	......	16,000	......
2/15	......	3,253,104	......	......	9,600	3,200
2/23	......	5,527,632	......	3,200	32,000	6,400
3/ 1	......	846,336	......	......	44,800	......
3/ 8	......	105,792	......	......	35,200	
3/15	......	396,720	......	1,600	60,800	
3/23	......	1,322,400	......	......	211,584	
3/29	......	634,752	......	1,600	264,480	
4/ 5	......	79,344	......	......	3,200	......
4/13	......	158,688	......	1,600	32,000	3,200
4/19	......	185,136	......	......	3,200	......
4/26	......	238,032	......	......	12,800	1,600
5/ 3	......	290,928	......	52,896	......	......
5/10	......	105,792	......	105,792	6,400	1,600
5/17	......	105,792	......	......	49,000	......
5/24	1,600	1,600	......	52,896	......	3,200
5/31				52,896	3,200	
6/ 7	......	52,896	......	105,792	28,800	......
6/16	......	79,344	......	16,000	22,400	3,200
6/21	......	105,792	......	......	79,344	......
6/28	......	1,600	......	1,600	16,000	......
7/ 5	......	793,440	......	1,600	6,400	52,896
7/12	......	1,401,744	......	......	185,136	79,344
7/19	......	2,486,112	......	......	51,200	3,200
7/26	......	3,702,720	......	......	105,792	158,688

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Chlamydomonas sp.	Chromulina sp.	Cryptomonas sp.	Dinobryon sertularia	Eudorina elegans	Euglena viridis
8/ 2		2,380,320			32,000	
8/ 9		1,957,152			1,163,712	3,200
8/15		8,569,152				
8/23		4,231,680			6,400	3,200
8/31		3,279,552				105,792
9/ 6		5,183,808	105,792			105,792
9/13		5,078,016			25,600	105,792
9/20		2,750,592			317,376	
9/27		4,453,264			105,792	
10/ 4		5,501,196			25,600	
10/11		2,644,800			105,792	
10/18		2,856,384				
10/26		1,639,776			6,400	
11/ 1		3,438,240			211,584	
11/ 8		4,601,952		52,896	105,792	
11/15		3,094,416			3,200	
11/22		8,727,840	1,600	3,200	22,400	
11/30		3,623,376	52,896	52,896	9,600	
12/ 6		2,512,560		3,200	52,896	
12/14		2,962,176	1,600		52,896	
12/20		3,253,104			9,600	
12/27		2,486,112			6,400	

1913	Flagellate unidentified	Hemidinium nasutum	Mallomonas sp.	Pandorina morum	Peridinium cinctum	Peridinium sp.
1/11						
1/19				1,600		
1/25	1,600			2,400		
2/ 2	52,896					
2/ 8				22,400		
2/15				3,200		
2/23				25,600		6,400
3/ 1				6,400		
3/ 8				9,600		
3/15				132,240		
3/23				79,344		
3/29	79,344			105,792		
4/ 5	79,344			3,200		
4/13						
4/19						
4/26	1,600			3,200	52,896	
5/ 3	1,600			185,136		
5/10	1,600					
5/17	3,200		3,200	6,400		
5/24				3,200		
5/31				3,200		
6/ 7			1,600			52,896
6/16				3,200		
6/21						
6/28						
7/ 5				1,600	105,792	
7/12				3,200		1,600
7/19			6,400			
7/26				6,400	3,200	
8/ 2		158,688		3,200		
8/ 9		264,480				
8/15						
8/23						
8/31		105,792		105,792		

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Flagellate unidentified	Hemidinium nasutum	Mallomonas sp.	Pandorina morum	Peridinium cinctum	Peridinium sp.
9/ 6		528,960				
9/13					105,792	
9/20		105,792			211,584	
9/27		105,792				
10/ 4						
10/11		105,792			317,376	
10/18						
10/26						
11/ 1				6,400	158,688	
11/ 8				6,400		
11/15				1,600		
11/22				25,600		
11/30				19,200		
12/ 6				6,400		
12/14				3,200		
12/20				3,200		
12/27						

1913	Phacus pleuronectes	Platydorina caudata	Pleodorina californica	Pleodorina illinoisensis	Pteromonas sp.	Syncrypta volvox
1/11						
1/19						
1/25						
2/ 2						
2/ 8						
2/15						52,896
2/23						
3/ 1						
3/ 8						
3/15						
3/23						
3/29						
4/ 5						
4/13						
4/19						
4/26						
5/ 3						
5/10						
5/17						
5/24						
5/31						
6/ 7						
6/16					52,896	
6/21						
6/28						
7/ 5			3,200		1,600	
7/12						
7/19						
7/26	3,200		6,400			
8/ 2		32,000	12,800			
8/ 9		64,000	105,792			
8/15						
8/23						
8/31		25,600				
9/ 6		12,800	51,200	25,600		12,800
9/13		76,800	12,800			
9/20		12,800	105,792			
9/27		12,800				
10/ 4		12,800				

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Phacus pleuronectes	Platydorina caudata	Pleodorina californica	Pleodorina illinoisensis	Pteromonas sp.	Syncrypta volvox
10/11	....	....	....	....	....	....
10/18	....	....	....	....	....	....
10/26	....	....	12,800	....	....	....
11/ 1	....	6,400	....	6,400	....	....
11/ 8	....	....	....	....	....	....
11/15	....	....	9,600	3,200	....	....
11/22	52,896	....	....	6,400	....	....
11/30	1,600	....	....	....	....	....
12/ 6	....	....	....	....	....	....
12/14	....	....	....	....	....	....
12/20	....	....	....	....	....	....
12/27	....	....	....	....	....	....

1913	Synura uvella	Trachelomonas euchlora	Trachelomonas volgensis	Trachelomonas volvocina	Volvox globator	Total Mastigophora
1/11	....	....	....	....	....	1,200
1/19	....	....	....	52,896	....	1,067,520
1/25	....	400	....	33,060	....	1,541,984
2/ 2	....	....	....	105,792	....	1,269,504
2/ 8	....	52,896	....	211,584	....	4,137,840
2/15	....	52,896	....	290,928	....	3,665,824
2/23	....	1,600	....	79,344	....	5,682,176
3/ 1	....	52,896	....	79,344	....	1,029,776
3/ 8	....	....	....	317,376	....	467,968
3/15	....	105,792	....	211,584	....	911,936
3/23	....	132,240	....	79,344	....	1,824,912
3/29	....	105,792	....	105,792	....	1,297,552
4/ 5	....	....	....	....	....	165,088
4/13	....	158,688	....	52,896	....	407,072
4/19	....	52,896	....	1,600	....	242,832
4/26	....	132,240	....	132,240	....	574,608
5/ 3	....	....	....	132,240	....	662,800
5/10	....	....	....	105,792	....	330,176
5/17	....	....	....	1,600	....	169,192
5/24	....	....	....	79,344	....	141,840
5/31	....	....	....	105,792	....	165 088
6/ 7	....	132,240	....	52,896	....	427,120
6/16	....	....	....	1,600	....	167,440
6/21	....	52,896	....	79,344	....	373,472
6/28	....	132,240	....	158,688	....	310,128
7/ 5	....	....	....	370,272	....	1,338,400
7/12	....	....	....	264,480	....	1,937,104
7/19	....	3,200	....	....	....	2,556,512
7/26	....	370,272	....	581,856	....	5,053,920
8/ 2	....	....	....	....	....	2,625,408
8/ 9	....	....	....	528,960	....	4,087,296
8/15	....	....	....	423,168	....	8,992,320
8/23	105,792	....	....	317,376	....	4,664,448
8/31	....	....	....	740,544	....	4,468,864
9/ 6	105,792	....	105,792	634,752	12,800	6,885,888
9/13	....	....	....	....	....	5,417,600
9/20	....	....	....	317,376	....	3,821,306
9/27	....	....	....	423,168	....	5,206,608
10/ 4	....	....	....	317,376	....	5,856,972
10/11	12,800	....	105,792	211,584	....	3,503,936
10/18	....	....	....	....	....	2,856,384
10/26	....	....	....	211,584	....	1,929.856
11/ 1	....	....	....	211,584	....	4,039,296
11/ 8	....	....	105,792	211,584	....	5,084,416
11/15	....	....	....	211,584	....	3,322,600

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Synura uvella	Trachelomonas euchlora	Trachelomonas volgensis	Trachelomonas volvocina	Volvox globator	Total Mastigophora
11/22				211,584		9,051,520
11/30			1,600	185,136		3,946,304
12/ 6	1,600		1,600	132,240	3,200	2,713,696
12/14				52,896		2,872,768
12/20	1,600			52,896		2,320,400
12/27			3,200	132,240		2,627,952

1913	Amoeba proteus	Amoeba radiosa	Arcella vulgaris	Cyphoderia ampulla	Difflugia corona	Difflugia globulosa
1/11						
1/19			3,200			
1/25						
2/ 2						
2/ 8						
2/15				6,400		
2/23						
3/ 1						
3/ 8						1,600
3/15				3,200		3,200
3/23						
3/29						
4/ 5			3,200			
4/13						
4/19						
4/26		3,200				
5/ 3						
5/10						
5/17						
5/24						
5/31	1,600					
6/ 7						
6/16						
6/21						
6/28			12,800			
7/ 5						
7/12		1,600		6,400		
7/19						
7/26		105,792		6,400		
8/ 2		3,200				
8/ 9				6,400		
8/15						
8/23	12,800	3,200	6,400			
8/31					12,800	
9/ 6	12,800	105,792				
9/13						
9/20		423,168				
9/27			12,800			
10/ 4						
10/11	105,792					
10/18		105,792				
10/26	52,896	52,896				
11/ 1		52,896	52,896			
11/ 8					6,400	
11/15						
11/22						
11/30						
12/ 6						
12/14						
12/20						
12/27		52,896				

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Difflugia pyriformis	Hyalodiscus sp.	Microgromia socialis	Trinema enchelys	Total Rhizopoda	Actinophrys sol.
1/11						
1/19					3,200	
1/25	800				800	
2/ 2	1,600				1,600	
2/ 8	12,800				12,800	
2/15	22,400				28,800	
2/23	6,400		1,600		11,200	
3/ 1	1,600				4,800	
3/ 8	6,400				11,200	
3/15	79,344		1,600		87,344	
3/23	3,200		1,600		6,400	
3/29					6,400	
4/ 5	12,800				16,000	
4/13	16,000		1,600		17,600	
4/19	211,584		1,600		213,184	
4/26	238,032		105,792		348,624	
5/ 3	79,344				79,344	
5/10	32,000				32,000	
5/17	79,344				79,344	
5/24	140,800				140,800	6,400
5/31	264,480				266,080	
6/ 7	132,240		3,200		138,640	79,344
6/16	105,792				105,792	
6/21	105,792				105,792	12,800
6/28	317,376		1,600		331,776	3,200
7/ 5	238,032				241,232	
7/12	105,792		52,896		220,584	
7/19	3,200		3,200		6,400	
7/26	6,400		3,200		124,992	
8/ 2	6,400		3,200		12,800	
8/ 9	6,400				12,800	
8/15				5,501,184	5,501,184	
8/23			423,168		448,768	
8/31		317,376			647,552	
9/ 6		317,376	1,163,712	105,792	2,022,848	105,792
9/13		105,792	211,584		422,168	
9/20			317,376		740,544	
9/27			105,792		118,592	12,800
10/ 4		211,584	528,960		753,344	211,584
10/11			211,584	105,792	317,376	317,376
10/18			105,792		211,584	
10/26		105,792	264,480		476,064	
11/ 1		52,896	105,792		264,480	
11/ 8		52,896	52,896	105,792	105,792	
11/15					1,600	
11/22						
11/30				1,600		
12/ 6	1,600			1,600	1,600	
12/14	3,200				3,200	
12/20						
12/27				3,200	1,600	

1913	Heterophrys fockei	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans	Total Heliozoa	Ciliate unidentified
1/11						
1/19						
1/25						
2/ 2						1,600
2/ 8						9,600

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Heterophrys fockei	Nuclearia simplex	Pinaciophora fluviatilis	Raphidiophrys elegans	Total Heliozoa	Ciliate unidentified
2/15						1,600
2/23					3,200	1,600
3/ 1						1,600
3/ 8						
3/15						52,896
3/23		1,600				9,600
3/29						
4/ 5						
4/13						12,800
4/19						
4/26				1,600	1,600	
5/ 3				79,344	79,344	
5/10				1,600	1,600	
5/17					25,600	3,200
5/24					6,400	
5/31				41,600	41,600	
6/ 7					79,344	
6/16				1,600	1,600	
6/21					12,800	
6/28				105,792	108,992	
7/ 5				79,344	79,344	
7/12		52,896		264,480	264,480	
7/19	211,584			423,168	634,752	
7/26	211,584			317,376	528,960	
8/ 2	211,584			687,648	899,232	
8/ 9	211,584			105,792	317,376	
8/15						
8/23				1,005,024	1,005,024	
8/31		317,376		211,584	211,584	
9/ 6	105,792	317,376		211,584	423,168	
9/13		105,792				
9/20	423,168				423,168	
9/27	317,376				541,760	
10/ 4	2,962,176	12,800			3,173,760	
10/11	211,584		1,269,504		1,798,464	
10/18	105,792		528,960		634,752	
10/26	52,896		423,168		476,064	
11/ 1			158,688	52,896	211,584	
11/ 8			105,792	687,648	799,840	
11/15			1,600	1,216,608	1,218,208	
11/22						
11/30						
12/ 6						
12/14						
12/20						
12/27		1,600				

1913	Cyclidium sp.	Didinium nasutum	Euplotes harpa	Euplotes patella	Halteria grandinella	Hastatella radians
1/11						
1/19						
1/25						
2/ 2						
2/ 8						
2/15			6,400		3,200	
2/23			3,200	9,600	3,200	3,200
3/ 1			3,200			
3/ 8		3,200	3,200			
3/15			9,600	3,200		

Table 3.—Organisms Per Cubic Meter in Plankton of Smith's Canal in 1913—(*Continued*)

1913	Cyclidium sp.	Didinium nasutum	Euplotes harpa	Euplotes patella	Halteria grandinella	Hastatella radians
3/23			28,800			
3/29			6,400	3,200		
4/5			3,200			
4/13						
4/19						
4/26					52,896	
5/3						
5/10						
5/17						
5/24						
5/31						
6/7						
6/16						
6/21						
6/28						
7/5						
7/12						
7/19						
7/26						
8/2						
8/9	3,200					
8/15					3,200	
8/23						
8/31	105,792					
9/6						
9/13	105,792					
9/20	105,792					
9/27						
10/4						
10/11						
10/18						
10/26						
11/1			32,000			
11/8			12,800			
11/15		1,600	158,688			
11/22			92,800		3,200	
11/30		3,200	9,600			
12/6			41,600			
12/14						
12/20						
12/27						

1913	Holophrya sp.	Paramecium aurelia	Paramecium bursaria	Prorodon sp.	Stentor coeruleus	Stentor niger
1/11						
1/19						
1/25		1,600			800	
2/2						
2/8						
2/15						3,200
2/23	1,600			1,600		
3/1	3,200					
3/8	3,200	3,200				6,400
3/15	3,200					
3/23	3,200			1,600		3,200
3/29						3,200
4/5	105,792					
4/13	105,792					
4/19	1,600			1,600		

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Holophrya sp.	Paramecium aurelia	Paramecium bursaria	Prorodon sp.	Stentor coeruleus	Stentor niger
4/26	52,896				3,200	3,200
5/ 3						3,200
5/10						
5/17	3,200					3,200
5/24	52,896					
5/31	1,600					
6/ 7	1,600					
6/16	1,600					
6/21	1,600					
6/28	1,600					
7/ 5	52,896					
7/12	290,928					
7/19	6,400					
7/26	3,200					
8/ 2	105,792					
8/ 9	211,584					
8/15						
8/23				105,792		
8/31	211,584					
9/ 6	1,904,256					
9/13	423,168					
9/20	211,584					
9/27	12,800					12,800
10/ 4	740,544					
10/11	317,376					
10/18						
10/26						6,400
11/ 1	105,792					
11/ 8	158,688	25,600		52,896		
11/15		16,000	19,200			3,200
11/22	1,600		3,200			
11/30	1,600					
12/ 6	79,344					
12/14	52,896					
12/20	52,896				3,200	3,200
12/27	3,200	1,600		52,896		3,200

1913	Tintinnidium fluviatile	Vorticella longifilum	Vorticella sp.	Total Ciliata	Acineta sp.	Sphaerophrya sp.
1/11						
1/19						
1/25				2,400		
2/ 2				1,600		
2/ 8		1,600		11,200		
2/15				14,400		
2/23		3,200		28,200		
3/ 1				8,000		
3/ 8			6,400	25,600		
3/15		3,200		72,096		
3/23		1,600		48,000		
3/29				12,800		
4/ 5				108,992		
4/13			1,600	120,192		
4/19			1,600	6,400		
4/26			1,600	113,792		
5/ 3			1,600	4,800		
5/10			105,792	105,792		
5/17			158,688	168,288		
5/24		3,200	158,688	214,784		

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Tintinnidium fluviatile	Vorticella longifilum	Vorticella sp.	Total Ciliata	Acineta sp.	Sphaerophrya sp.
5/31	...	...	238,032	239,632	...	...
6/ 7	...	...	211,584	213,184	...	...
6/16	...	...	211,584	213,184	...	...
6/21	...	3,200	449,616	454,416	...	...
6/28	...	6,400	423,168	440,768	...	...
7/ 5	...	...	581,856	634,752	...	...
7/12	...	...	793,440	1,084,268	...	...
7/19	...	...	581,856	588,256	...	...
7/26	...	...	952,128	955,328	105,792	...
8/ 2	...	...	1,533,984	1,639,776	...	...
8/ 9	...	...	952,128	1,166,912	6,400	6,400
8/15	...	...	...	3,200	...	...
8/23	...	...	105,792	211,584	...	...
8/31	...	...	1,798,464	2,327,424	105,792	...
9/ 6	...	...	634,752	2,551,808	...	38,400
9/13	211,584	...	211,584	952,128	...	12,800
9/20	...	105,792	846,336	1,269,504	...	...
9/27	105,792	...	634,752	804,544	...	...
10/ 4	105,792	12,800	423,168	1,282,304	...	...
10/11	...	...	528,960	964,928	...	64,000
10/18	...	...	740,544	740,544	...	12,800
10/26	...	25,600	581,856	618,856	...	6,400
11/ 1	6,400	...	105,792	249,984	...	...
11/ 8	...	...	158,688	408,772	...	...
11/15	...	...	52,896	261,184	...	...
11/22	...	3,200	3,200	108,800	...	...
11/30	1,600	...	132,240	148,040	...	...
12/ 6	...	9,600	...	130,544	...	3,200
12/14	...	3,200	1,600	59,296	...	...
12/20	...	...	79,344	138,640	...	...
12/27	9,600	1,600	1,600	73,696	...	...

1913	Total Suctoria	Total Protozoa without Mastigophora	Total Protozoa with Mastigophora	Collotheca egg, attached	Collotheca pelagica	Collotheca sp.
1/11	...	...	1,200	...	...	...
1/19	...	3,200	1,070,720	...	...	...
1/25	...	3,200	1,545,184	...	...	...
2/ 2	...	3,200	1,272,704	...	...	...
2/ 8	...	24,000	4,161,840	...	...	...
2/15	...	43,200	3,709,024	...	...	...
2/23	...	42,600	5,724,776	...	...	...
3/ 1	...	12,800	1,042,576	...	...	...
3/ 8	...	36,800	504,768	...	...	...
3/15	...	159,440	1,071,376	...	...	...
3/23	...	54,400	1,879,312	...	...	...
3/29	...	19,200	1,316,752	...	...	...
4/ 5	...	124,992	290,080	...	...	...
4/13	...	137,792	544,864	...	...	...
4/19	...	219,584	462,416	...	...	...
4/26	...	464,016	1,039,624	...	...	...
5/ 3	...	163,488	826,288	...	...	...
5/10	...	139,392	469,568	...	...	...
5/17	...	273,232	442,424	...	...	...
5/24	...	361,984	503,824	...	...	...
5/31	...	547,312	712,400	...	...	...
6/ 7	...	431,168	858,288	...	...	...
6/16	...	320,576	488,016	...	...	...
6/21	...	573,008	946,480	...	...	...
6/28	...	881,536	1,191,664	...	...	...

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Total Suctoria	Total Protozoa without Mastigophora	Total Protozoa with Mastigophora	Collotheca egg, attached	Collotheca pelagica	Collotheca sp.
7/ 5	...	955,328	2,293,728	...	...	...
7/12	...	1,569,432	3,506,536	...	...	...
7/19	...	1,229,408	3,785,920	...	...	...
7/26	105,792	1,715,072	6,768,992	...	...	...
8/ 2	44,800	2,596,608	5,222,016	...	...	...
8/ 9	12,800	1,509,888	5,597,184	...	...	...
8/15	...	5,504,384	14,496,704	...	...	...
8/23	...	1,665,376	6,329,824	25,600	19,200	...
8/31	105,792	3,292,352	7,761,216	...	12,800	...
9/ 6	38,400	5,036,224	11,922,112	...	...	...
9/13	12,800	1,387,096	6,904,696	51,200	51,200	...
9/20	...	2,433,216	6,254,522	38,400	51,200	...
9/27	...	1,464,896	6,671,504	...	...	...
10/ 4	...	5,209,408	11,066,380	105,792	12,800	211,584
10/11	64,000	3,144,768	6,644,704	423,168	...	153,600
10/18	12,800	1,599,680	4,456,064	25,600	64,000	...
10/26	6,400	1,577,384	3,507,240	52,896	105,792	...
11/ 1	...	726,048	4,765,344		12,800	...
11/ 8	...	1,314,404	6,398,820	52,896	52,896	...
11/15	...	1,480,992	4,803,592	...	3,200	...
11/22	3,200	112,000	9,163,520	6,400	3,200	...
11/30	...	148,040	4,094,344	...	...	...
12/ 6	3,200	135,344	2,849,040	...	...	...
12/14	...	62,496	2,935,264	...	...	...
12/20	...	138,640	2,459,040	...	...	...
12/27	...	75,296	2,703,248	...	...	...

1913	Total Rhizota	Rotaria neptunia	Rotaria rotatoria	Rotifer egg, winter	Total Bdelloida	Anuraeopsis egg, attached
1/11	...	...	1,600	...	1,600	...
1/19	...	...	36,800	...	46,400	...
1/25	...	3,200	19,836	...	23,036	...
2/ 2	...	1,600	11,200	...	22,800	...
2/ 8	...	...	35,200	...	48,000	...
2/15	...	...	80,000	6,400	92,800	...
2/23	...	3,200	35,200	...	44,800	...
3/ 1	...	...	79,344	...	98,544	...
3/ 8	3,200	3,200	185,136	...	236,336	...
3/15	...	...	28,800	3,200	38,400	...
3/23	...	3,200	64,000	...	68,800	...
3/29	...	...	60,800	...	60,800	...
4/ 5	...	...	16,000	...	22,400	...
4/13	...	...	6,400	...	9,600	...
4/19	...	...	19,200	...	20,800	...
4/26	...	...	...	...	6,400	...
5/ 3	...	...	3,200	6,400	4,800	...
5/10	...	...	1,600	...	1,600	...
5/17	...	3,200	12,800	...	32,000	...
5/24	...	...	...	3,200	6,400	...
5/31	...	...	9,600	...	168,288	...
6/ 7	...	...	...		9,600	...
6/16	...	...	...	...	...	...
6/21	...	...	6,400	...	6,400	...
6/28	...	...	...	...	...	...
7/ 5	...	...	6,400	3,200	112,192	...
7/12	...	...	52,896	6,400	105,792	...
7/19	...	...	...	...	3,200	...
7/26	...	...	...	6,400	158,688	...
8/ 2	...	12,800	6,400	...	177,888	...

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Total Rhizota	Rotaria neptunia	Rotaria rotatoria	Rotifer egg, winter	Total Bdelloida	Anuraeopsis egg, attached
8/9		32,000	38,400		76,800	
8/15	3,200					
8/23	44,800	12,800	19,200		249,984	
8/31	12,800				25,600	105,792
9/6					105,792	
9/13	102,400				211,584	51,200
9/20	89,600		12,800	105,792	224,384	
9/27		12,800	12,800		89,600	
10/4	330,176				25,600	
10/11	576,768	12,800			51,200	
10/18	89,600		12,800		12,800	
10/26	158,688	12,800	6,400		72,096	
11/1	12,800	52,896	6,400		59,296	
11/8	105,792	12,800	6,400	6,400	25,600	
11/15	3,200	3,200	12,800	3,200	16,000	
11/22	9,600	3,200	6,400	52,896	9,600	
11/30			6,400	3,200	6,400	
12/6		3,200			3,200	
12/14			3,200		3,200	
12/20						
12/27		6,400	9,600			

1913	Anuraeopsis fissa	Anuraeopsis sp.	Asplanchna brightwellii	Brachionus angularis	Brachionus angularis caudatus	Brachionus budapestenensis
1/11						
1/19						
1/25						
2/2						
2/8						
2/15						
2/23						
3/1						
3/8				3,200		
3/15			1,600			
3/23				19,200		
3/29						
4/5						
4/13						
4/19				22,400		
4/26						
5/3				3,200		
5/10				16,000		
5/17				35,200		
5/24				48,000	3,200	
5/31		211,584	3,200	32,000	48,000	
6/7				9,600	3,200	9,600
6/16				9,600	3,200	
6/21		1,600		3,200	38,400	
6/28					105,792	
7/5				1,600	105,792	
7/12		6,400	3,200	6,400	687,648	
7/19		6,400			57,600	6,400
7/26		6,400			105,792	
8/2		3,200			370,272	38,400
8/9	105,792				44,800	6,400
8/15						
8/23	6,400			6,400	158,688	6,400
8/31	211,584				740,544	
9/6	51,200				317,376	

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Anuraeopsis fissa	Anuraeopsis sp.	Asplanchna brightiwellii	Brachionus angularis	Brachionus angularis caudatus	Brachionus budapestenensis
9/13	64,000				422,400	12,800
9/20	....	....	....	12,800	25,600	
9/27	317,376	....	12,800	....	64,000	
10/4	12,800	....	....	....	38,400	38,400
10/11					25,600	
10/18	105,792	....	....	....	211,584	
10/26	....	....	....	....	6,400	
11/1	6,400	....	....	....	19,200	
11/8	6,400			6,400		
11/15	1,600					
11/22	52,896	....	6,400	3,200		
11/30	1,600					
12/6						
12/14						
12/20						
12/27						

1913	Brachionus calyciflorus	Brachionus capsuliflorus	Brachionus egg; attached, female	Brachionus egg; attached, male	Brachionus egg; free, female	Brachionus egg; free, male
1/11					1,200	
1/19	6,400	....	....	3,200	1,600	
1/25	3,200	....	1,600	800	1,600	
2/2	1,600	1,600	....	....	3,200	
2/8	38,400	....	9,600	....	3,200	
2/15	185,136	....	238,032	3,200	6,400	
2/23	48,000	....	28,800	....	3,200	1,600
3/1	6,400	....	9,600	....		
3/8	38,400	....	9,600	158,688	9,600	
3/15	9,600	....	....	....	3,200	6,400
3/23	41,600	6,400	22,400		9,600	
3/29	6,400	....			52,896	
4/5	6,400				3,200	
4/13	3,200	....	....	....		
4/19						
4/26	1,600	3,200	....			
5/3	6,400	3,200	9,600	....	1,600	
5/10	....	....	3,200			
5/17	9,600	3,200	12,800	9,600		
5/24	....	3,200	9,600			
5/31		....	3,200		52,896	
6/7	....	3,200	....	....	6,400	
6/16		....	12,800		1,600	
6/21	....	....	6,400			
6/28	3,200	....	22,400	....	1,600	
7/5	....	....	12,800	6,400		
7/12	....	52,896	79,344		158,688	
7/19	19,200					
7/26	6,400	....	25,600	....	105,792	
8/2	105,792	6,400	19,200	....	12,800	
8/9	6,400	317,376	32,000	44,800	....	
8/15	....	3,200	....	....	158,688	
8/23	....	6,400	....	....	3,200	
8/31	317,376	12,800	76,800	....	317,376	
9/6	....	12,800	12,800	....	105,792	
9/13	51,200	....	64,000	....	317,376	
9/20	25,600					
9/27	211,584	25,600	51,200	....	12,800	
10/4	211,584	25,600	317,376	....	211,584	
10/11	204,800	....	256,000	....	317,376	

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Brachionus calyciflorus	Brachionus capsuliflorus	Brachionus egg; attached, female	Brachionus egg; attached, male	Brachionus egg; free, female	Brachionus egg; free, male
10/18	12,800		105,792			
10/26	32,000				105,792	
11/ 1	12,800		6,400		6,400	
11/ 8	12,800					
11/15	3,200	1,600				
11/22	3,200				132,240	
11/30					3,200	
12/ 6					3,200	
12/14					3,200	
12/20						
12/27					1,600	

1913	Brachionus patulus	Brachionus plicatilis	Brachionus urceus	Diurella egg, free	Epiphanes clavulata	Epiphanes egg, attached, female
1/11		400				
1/19		1,600				
1/25		2,400	800			
2/ 2			1,600			
2/ 8						
2/15		3,200				
2/23		9,600				
3/ 1			3,200			
3/ 8		12,800				
3/15						
3/23		3,200				
3/29		3,200				
4/ 5		3,200				
4/13						
4/19						
4/26						
5/ 3			3,200			
5/10						
5/17		3,200	3,200	3,200		
5/24				22,400		
5/31				238,032		
6/ 7			3,200			
6/16			9,600	9,600		
6/21			3,200	22,400		
6/28			6,400	105,792		
7/ 5			3,200	6,400		
7/12	6,400		12,800	555,408		
7/19			6,400	158,688		
7/26	19,200		6,400	3,200		
8/ 2	12,800			317,376		
8/ 9	6,400	6,400	12,800	370,272		
8/15						
8/23				740,544	158,688	3,200
8/31			12,800	846,336	76,800	51,200
9/ 6	38,400					
9/13				528,960	128,000	12,800
9/20			38,400	105,792	76,800	38,400
9/27				528,960	12,800	
10/ 4				634,752		
10/11				211,584	25,600	
10/18			12,800	105,792		
10/26			6,400	6,400		
11/ 1					52,896	
11/ 8						
11/15						

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Brachionus patulus	Brachionus plicatilis	Brachionus urceus	Diurella egg, free	Epiphanes clavulata	Epiphanes egg; attached, female
11/22						
11/30						
12/ 6						
12/14						
12/20						
12/27						

1913	Filinia egg, attached, female	Filinia egg, attached, male	Filinia egg, free	Filinia longiseta	Keratella cochlearis	Keratella egg, attached
1/11				800		400
1/19					4,800	4,800
1/25						2,400
2/ 2					6,400	3,200
2/ 8				3,200	3,200	1,600
2/15				1,600	35,200	19,200
2/23	16,000		6,400	92,800	60,800	16,000
3/ 1	3,200	9,600	9,600	44,800	79,344	9,600
3/ 8		3,200	185,136	60,800	80,000	12,800
3/15			158,688	57,600	317,376	132,240
3/23	22,400			99,200	634,752	370,272
3/29	6,400			32,000	476,064	211,584
4/ 5				3,200	238,032	1,600
4/13				3,200	264,480	52,896
4/19				6,400	502,512	238,032
4/26				1,600	264,480	52,896
5/ 3			79,344	9,600	423,168	185,136
5/10				6,400	83,200	6,400
5/17			1,600	19,200	79,344	3,200
5/24			79,344	3,200	25,600	3,200
5/31					687,648	79,344
6/ 7			9,600	9,600	105,792	
6/16				3,200	32,000	
6/21			158,688	3,200	105,792	3,200
6/28				105,792	264,480	105,792
7/ 5				22,400	449,616	16,000
7/12			132,240	12,800	1,824,912	1,600
7/19					317,376	19,200
7/26				6,400	44,800	25,600
8/ 2			211,584		19,200	
8/ 9			211,584			
8/15					6,400	
8/23			158,688			
8/31			423,168			
9/ 6			105,792		51,200	
9/13						
9/20						
9/27			211,584		25,600	
10/ 4			105,792	12,800		25,600
10/11						211,584
10/18			211,584		1,269,504	105,792
10/26					3,173,760	687,648
11/ 1					4,549,056	1,586,880
11/ 8					793,440	317,376
11/15					317,376	79,344
11/22	3,200		1,600		343,824	238,032
11/30					52,896	19,200
12/ 6					52,896	16,000
12/14					3,200	52,896
12/20						
12/27			1,600			

Table 3.—Organisms Per Cubic Meter in Plankton of Smith's Canal in 1913—(*Continued*)

1913	Keratella egg, free	Keratella quadrata	Notholca striata	Polyarthra trigla	Polyarthra trigla egg; attached, female	Synchaeta sp.
1/11	2,000	1,600				
1/19	1,600	8,000		3,200		1,600
1/25	19,836	8,000	1,600	19,836		8,000
2/ 2	79,344	6,400	1,600	1,600		1,600
2/ 8	185,136	132,240		211,584		
2/15	185,136	25,600	6,400	132,240		
2/23	12,800	6,400		12,800		6,400
3/ 1		6,400		9,600		9,600
3/ 8		3,200		3,200		156,800
3/15			6,400			3,200
3/23	343,824	79,344		12,800		28,800
3/29	211,584	9,600	1,600	1,600		12,800
4/ 5	52,896	132,240	3,200	6,400		16,000
4/13	79,344	25,600		6,400		6,400
4/19	105,792	19,200	3,200	38,400		22,400
4/26	3,200	28,800		73,600		3,200
5/ 3	158,688	28,800		48,000	3,200	44,800
5/10	22,400	19,200		16,000		3,200
5/17	79,344	105,792		25,600		108,800
5/24				3,200		
5/31	317,376	3,200		76,800		608,304
6/ 7	3,200	6,400		9,600		
6/16						
6/21	52,896	6,400		19,200		3,200
6/28	158,688	185,136		79,344		370,272
7/ 5	264,480	3,200		12,800		35,200
7/12	661,200	79,344		370,272	1,600	52,896
7/19	317,376	19,200		25,600		
7/26	3,200	108,800		51,200		
8/ 2		105,792		211,584		6,400
8/ 9		70,400		105,792		12,800
8/15		44,800		6,400		
8/23		25,600		105,792		6,400
8/31	317,376	12,800		128,000	12,800	211,584
9/ 6		25,600		38,400		38,400
9/13	317, 76	51,200		153,600		12,800
9/20				423,168		
9/27		211,584		89,600		211,584
10/ 4		211,584				
10/11		423,168		12,800		423,168
10/18	211,584	317,376		105,792		211,584
10/26	264,480	158,688	6,400	6,400		264,480
11/ 1	423,168	105,792	12,800			211,584
11/ 8	52,896					370,272
11/15	52,896	3,200				52,896
11/22	132,240	6,400		6,400		105,792
11/30	1,600	6,400		12,800	3,200	105,792
12/ 6		1,600		264,480	3,20)	79,344
12/14	6,4 0	79,344		6,400		238,032
12/20	6,400	6,400		6,400		25,600
12/27	3,200	3,200		3,200		185,136

1913	Trichocerca capucina	Trichocerca iernis	Total Ploima	Total Rotifera	Bosmina longirostris	Chydorus sp.
1/11			6,800	8,400		
1/19			36,800	83,200		
1/25			71,272	94,308		800
2/ 2			108,144	130,944		
2/ 8			481,520	529,520		

Table 3.—Organisms Per Cubic Meter in Plankton of Smith's Canal in 1913—(*Continued*)

1913	Trichocerca capucina	Trichocerca iernis	Total Ploima	Total Rotifera	Bosmina longirostris	Chydorus sp.
2/15			841,344	934,144		
2/23			324,800	369,600		
3/ 1			200,944	299,488		
3/ 8			737,424	976,960		
3/15			696,304	734,704		
3/23			1,693,792	1,762,592	3,200	
3/29			1,025,728	1,086,528		
4/ 5			466,368	488,768		
4/13			441,520	451,120		
4/19			958,336	979,136	6,400	
4/26			432,576	438,976		
5/ 3			1,011,136	1,015,936		
5/10			179,200	180,800		
5/17	6,400		506,080	538,080		
5/24			204,144	210,544		
5/31	3,200	12,800	2,377,584	2,545,872		
6/ 7			179,392	188,992		
6/16			83,200	83,200		
6/21		6,400	434,176	440,576		
6/28	9,600	16,000	1,540,288	1,540,288		
7/ 5	3,200	79,344	1,022,432	1,134,624	3,200	
7/12	3,200	185,136	4,896,784	5,002,576	4,800	
7/19		3,200	959,840	963,040		
7/26	6,400		544,384	703,072	6,400	
8/ 2	6,400	19,200	1,466,400	1,644,288	6,400	
8/ 9		32,000	1,398,816	1,475,616	12,800	
8/15			219,488	219,488	32,000	
8/23		211,584	1,604,384	1,899,178		12,800
8/31		211,584	4,086,720	4,125,120	12,800	
9/ 6		38,400	1,047,744	1,153,536	38,400	
9/13		211,584	2,412,096	2,726,080	38,400	
9/20	12,800	51,200	916,352	1,230,336	51,200	
9/27		740,544	2,727,626	2,817,226	12,800	
10/ 4		423,168	2,269,450	2,625,226	12,800	
10/11		105,792	2,217,472	2,845,440	25,600	
10/18		12,800	3,000,576	3,102,976		
10/26		6,400	4,725,248	4,956,032		
11/ 1			7,006,176	7,078,272		52,896
11/ 8			1,565,984	1,697,376		
11/15			515,312	534,512		
11/22			1,091,520	1,110,720		9,600
11/30			209,888	216,288		
12/ 6			420,720	423,920		
12/14			389,472	392,672		3,200
12/20			44,800	44,800		
12/27			197,936	197,936		

1913	Sida sp.	Total Cladocera	Canthocamptus sp.	Cyclops sp.	Nauplius sp.	Total Copepoda
1/11						
1/19				1,600	1,600	3,200
1/25		800			3,200	3,200
2/ 2				3,200	6,400	9,600
2/ 8				3,200	3,200	6,400
2/15			3,200			3,200
2/23					3,200	3,200
3/ 1						
3/ 8						
3/15			3,200			3,200

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Continued*)

1913	Sida sp.	Total Cladocera	Cauthocamptus sp.	Cyclops sp.	Nauplius sp.	Total Copepoda
3/23		3,200				
3/29			3,200		1,600	4,800
4/5					3,200	3,200
4/13				3,200		3,200
4/19		6,400				
4/26						
5/3				3,200	9,600	12,800
5/10				3,200		3,200
5/17						
5/24				3,200	9,600	12,800
5/31	6,400	6,400		3,200	9,600	12,800
6/7				3,200	16,000	19,200
6/16				9,600		9,600
6/21				9,600	3,200	16,000
6/28	3,200	3,200			9,600	9,600
7/5		3,200		3,200		3,200
7/12	19,600	24,400		24,400	6,400	30,840
7/19	6,400	6,400			6,400	6,400
7/26		6,400		25,600	25,600	51,200
8/2	12,800	19,200		12,800	6,400	19,200
8/9		12,800		44,800	19,200	64,000
8/15		32,000				32,000
8/23		12,800		6,400	12,800	19,200
8/31	12,800	25,600	12,800	25,600	25,600	64,000
9/6		38,400			12,800	12,800
9/13		38,400			25,600	25,600
9/20		51,200				
9/27		12,800	12,800	105,792		118,592
10/4		12,800			25,600	25,600
10/11		25,600			12,800	12,800
10/18						
10/26					6,400	6,400
11/1	6,400	59,296				
11/8						
11/15						
11/22		9,600				
11/30						
12/6						
12/14		3,200				
12/20				1,600	1,600	3,200
12/27						

1913	Total Malacostraca	Total Entomostraca	Glochidia	Macrobiotus sp.	Nematode sp.	Total Miscellaneous	Total Organisms
1/11							1,008,388
1/19	20	3,220			4,800	6,400	10,034,524
1/25		4,000			800	800	6,611,056
2/2		9,600		1,600		1,600	9,370,608
2/8		6,400			3,200	3,200	18,043,608
2/15		3,200					11,550,608
2/23		3,200					17,982,424
3/1							23,079,776
3/8					3,200	3,200	12,047,088
3/15		3,200					14,866,400
3/23		3,200			6,400	6,400	19,465,312
3/29		4,800	1,600			1,600	26,761,792
4/5		3,200				6,400	6,492,272
4/13		3,200					11,646,736
4/19		6,400		1,600		1,600	13,637,936

TABLE 3.—ORGANISMS PER CUBIC METER IN PLANKTON OF SMITH'S CANAL IN 1913—(*Concluded*)

1913	Total Malacostraca	Total Entomostraca	Glochidia	Macrobiotus sp.	Nematode sp.	Total Miscellaneous	Total Organisms
4/26	...	...	...	...	...	...	17,044,080
5/ 3	...	12,800	...	...	...	...	8,636,424
5/10	...	3,200	...	...	...	...	9,321,920
5/17	...	...	...	...	...	...	9,352,280
5/24	...	12,800	...	...	...	...	5,949,936
5/31	...	19,200	...	...	...	...	5,686,592
6/ 7	...	19,200	...	...	...	...	10,101,808
6/16	...	9,600	...	...	...	...	15,708,784
6/21	...	16,000	...	...	...	...	19,352,112
6/28	...	12,800	...	...	...	...	26,840,944
7/ 5	...	6,400	...	...	...	...	21,363,952
7/12	...	55,240	3,200	...	...	3,200	40,626,488
7/19	...	12,800	...	...	...	...	39,153,568
7/26	...	57,600	6,400	...	...	6,400	61,220,318
8/ 2	...	38,400	...	6,400	...	6,400	66,621,792
8/ 9	...	76,800	6,400	...	...	6,400	114,201,816
8/15	...	32,000	...	...	...	...	166,868,542
8/23	...	32,000	6,400	...	...	6,400	141,852,410
8/31	...	90,600	...	...	...	...	154,898,534
9/ 6	...	51,200	...	...	...	...	254,328,524
9/13	...	64,000	...	...	...	...	118,178,940
9/20	...	51,200	...	...	...	...	181,305,952
9/27	...	131,392	...	...	...	...	129,678,426
10/ 4	...	38,400	...	...	...	...	109,717,814
10/11	...	38,400	...	...	...	105,792	110,191,392
10/18	...	...	...	...	...	...	69,781,440
10/26	...	6,400	...	...	...	...	76,617,328
11/ 1	...	59,296	...	...	...	...	46,179,728
11/ 8	...	...	...	...	...	...	25,234,116
11/15	...	...	...	...	...	...	13,720,308
11/22	...	9,600	...	...	...	...	17,451,856
11/30	...	...	...	...	...	...	12,172,344
12/ 6	...	...	...	...	...	...	16,988,928
12/14	...	3,200	...	...	...	...	10,538,544
12/20	...	3,200	...	...	...	...	6,416,352
12/27	...	...	...	...	...	3,200	7,787,568

Table 4.—Plankton Organisms Per Cubic Meter in Stockton Channel, Daily Series in 1913.

1913	Spirillum undula	Total Bacteriaceae	Anabaena sp.	Aphanacapsa sp.	Gloeocapsa conglomerata	Gloeocapsa sp.
7/ 5	105,792	105,792	......	476,064	......	264,480
7/ 6	......	......	......	952,128	......	3,200
7/ 7	......	......	......	528,960	......	370,272
7/ 8	......	......	105,792	793,440	528,960	211,584
7/ 9	......	......	158,688	687,648	38,400	370,272
7/10	......	......	528,960	634,752	846,336	158,688
7/11	......	......	528,960	634,752	740,544	476,064
7/12	......	......	1,163,712	1,005,024	899,232	581,856
7/13	......	......	370,272	1,745,568	1,005,024	476,064
7/14	......	......	634,752	1,428,192	581,856	1,639,776
7/15	......	......	264,480	1,163,712	899,232	1,586,880
7/16	......	......	846,336	1,216,608	158,688	1,375,296
7/17	......	......	581,856	793,440	......	740,544
7/18	3,200	3,200	3,200	211,584	......	211,584
7/19	......	......	581,856	158,688	3,200	528,960
7/20	......	......	12,800	3,200	......	476,064
7/21	......	......	3,200	105,792	......	264,480
7/22	......	......	211,584	3,200	......	264,480
7/23	......	......	105,792	6,400	......	264,480
7/24	......	......	6,400	3,200	3,200	158,688
7/25	3,200	3,200	211,584	......	6,400	317,376
7/26	......	......	211,584	264,480	......	1,005,024
7/27	......	......	158,688	264,480	211,584	1,057,920
7/28	......	......	211,584	105,792	......	634,752
7/29	......	......	211,584	105,792	......	793,440
7/30	......	......	158,688	211,584	3,200	317,376
7/31	......	......	6,400	......	......	423,168
8/ 1	......	......	105,792	6,400	......	317,376
8/ 2	3,200	3,200	......	3,200	......	105,792
8/ 3	......	......	211,584	12,800	......	634,752
8/ 4	......	......	3,200	158,688	......	105,792

1913	Gomphosphaera aponina	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria sp.	Oscillatoria tenuis
7/ 5	......	......	12,800	793,440	......	12,800
7/ 6	......	......	158,688	320,576	......	......
7/ 7	......	......	3,200	743,744	......	......
7/ 8	......	......	317,376	1,428,192	105,792	158,688
7/ 9	......	......	105,792	687,648	105,792	......
7/10	......	......	......	740,544	......	......
7/11	......	......	211,584	......	......	211,584
7/12	......	......	264,480	476,064	3,200	370,272
7/13	......	......	264,480	373,472	476,064	3,200
7/14	......	......	264,480	793,440	105,792	370,272
7/15	3,200	......	370,272	1,057,920	370,272	3,200
7/16	......	......	317,376	793,440	211,584	......
7/17	......	......	......	1,375,296	317,376	1,110,816
7/18	......	......	264,480	423,168	370,272	......
7/19	......	......	264,480	740,544	370,272	......
7/20	......	......	3,200	214,784	211,584	......
7/21	3,200	......	211,584	317,376	1,269,504	......
7/22	......	......	3,200	264,480	370,272	105,792
7/23	......	......	264,480	171,488	317,376	105,792
7/24	......	......	158,688	740,544	158,688	476,064
7/25	3,200	......	3,200	528,960	370,272	370,272
7/26	......	......	264,480	528,960	476,064	......
7/27	......	......	105,792	330,176	317,376	3,200
7/28	6,400	......	317,376	746,336	528,960	105,792
7/29	......	3,200	105,792	581,856	158,688	476,064

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Gomphosphaera aponina	Merismopedium glaucum	Microcystis sp.	Nostoc sp.	Oscillatoria sp.	Oscillatoria tenuis
7/30	...	...	211,584	323,776	317,376	....
7/31	3,200	...	317,376	267,680	740,544	317,376
8/ 1		...	264,480	264,480	317,376	158,688
8/ 2	...	3,200	105,792	3,200	476,064	3,200
8/ 3	...	6,400	3,200	581,856	370,272	211,584
8/ 4	3,200	...	3,200	264,480	476,064	211,584

1913	Phormidium spp.	Rivularia sp.	Total Schizophyceae	Actinastrum hantzschii	Actinastrum hantzschii (large)	Coelastrum microporum
7/ 5	...	...	1,559,584	3,200		6,400
7/ 6	211,584	3,200	1,649,376	3,200		105,792
7/ 7	211,584		1,857,760			158,688
7/ 8			3,649,824			264,480
7/ 9	...		2,164,240			158,688
7/10	370,272		3,279,552			3,200
7/11			2,803,488		...	105,792
7/12			4,763,840	6,400	12,800	158,688
7/13			4,723,744		...	423,168
7/14			5,818,560	3,200	3,200	211,584
7/15			5,719,168		6,400	158,688
7/16			4,919,328		105,792	105,792
7/17			4,919,328		211,584	158,688
7/18			1,484,288		19,200	3,200
7/19			2,648,002		19,200	105,792
7/20			921,632		6,400	105,792
7/21			2,280,928	6,400	105,792	105,792
7/22			1,223,008		105,792	...
7/23		6,400	1,262,208		6,400	211,584
7/24			1,705,472		3,200	...
7/25			1,811,264		6,400	105,792
7/26			2,750,602	3,200	105,792	476,064
7/27			2,449,216		105,792	158,688
7/28			2,756,992	3,200	19,200	6,400
7/29			2,436,416		211,584	158,688
7/30			1,543,584		6,400	211,584
7/31			2,075,744		3,200	...
8/ 1			1,434,592	3,200	12,800	264,480
8/ 2			703,648		6,400	105,792
8/ 3			2,032,448	6,400	19,200	211,584
8/ 4			1,226,208		3,200	211,584

1913	Lagerheimia wratislaviense	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum	Raphidium pyrenogerum
7/ 5			476,064	3,200		
7/ 6			846,336		...	3,200
7/ 7			528,960		...	105,792
7/ 8			1,269,504		264,480	370,272
7/ 9		6,400	1,005,024		105,792	3,200
7/10		105,792	793,440		...	158,688
7/11			1,110,816		3,200	...
7/12		...	1,269,504		3,200	
7/13		105,792	899,232		264,480	...
7/14	3,200		793,440		211,584	158,688
7/15			740,544	...	...	105,792
7/16			793,440	12,800	105,792	158,688
7/17			1,005,024		6,400	
7/18		...	634,752		3,200	3,200
7/19		12,800	740,544		3,200	

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Lagerheimia wratislaviense	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum	Raphidium pyrenogerum
7/20	....	....	211,584	6,400	....	....
7/21	....	12,800	211,584	3,200	....	3,200
7/22	....	....	476,064	12,800	....	158,688
7/23		6,400	634,752	158,688	3,200	3,200
7/24	.	105,792	528,960	105,792	....	105,792
7/25	.	....	317,376	19,200	3,200	158,688
7/26	....	6,400	793,440	19,200	3,200	264,480
7/27	3,200	....	793,440	6,400	3,200	105,792
7/28	.....	....	634,752	25,600	6,400	....
7/29		19,200	740,544	12,800	....	....
7/30	.	....	740,544	3,200	....	3,200
7/31			528,960	105,792	....	3,200
8/1	.	....	423,168	6,400	105,792	158,688
8/2	.	3,200	476,064	6,400	....	105,792
8/3	. .....	....	634,752	12,800	158,688	370,272
8/4	.	6,400	740,544	....	....	264,480

1913	Scenedesmus obliquus	Scenedesmus quadricauda	Schroederia setigera	Total Chlorophyceae	Asterionella gracillima	Amphiprora alata
7/5	158,688	370,272	....	1,021,024	....	3,200
7/6	3,200	687,648	....	1,649,376	....	....
7/7	476,064	634,752	3,200	1,907,456	105,792	....
7/8	370,272	1,163,712	....	3,702,720	....	3,200
7/9	211,584	634,752	....	2,131,840	....	....
7/10	370,272	1,057,920	....	2,489,202	....	3,200
7/11	....	1,005,024	3,200	2,228,032	....	....
7/12	211,584	476,064	....	2,138,232	....	3,200
7/13	211,584	1,005,024	105,792	3,014,072	....	3,200
7/14	528,960	1,057,920	....	2,971,776	....	3,200
7/15	264,480	264,480	158,688	1,699,072	3,200	....
7/16	423,168	1,375,296	....	3,080,768	....	....
7/17	264,480	899,232	158,688	2,704,096	....	3,200
7/18	317,376	423,168	264,480	1,668,576	....	....
7/19	528,960	952,128	....	2,462,624	....	6,400
7/20	3,200	264,480	....	597,856	....	....
7/21	158,688	158,688	158,688	819,040	....	....
7/22	476,064	423,168	3,200	1,655,776	....	3,200
7/23	105,792	581,856	105,792	1,817,664	....	....
7/24	317,376	793,440	3,200	1,963,552	....	....
7/25	211,584	899,232	158,688	1,880,160		
7/26	687,648	1,005,024	105,792	3,470,240		3,200
7/27	740,544	1,692,672	105,792	3,715,520		105,792
7/28	370,272	1,481,088	3,200	2,550,102		6,400
7/29	476,064	687,648	....	2,306,528	.	
7/30	317,376	634,752	3,200	1,919,256	.	3,200
7/31	3,200	581,856	3,200	1,229,408		105,792
8/1	634,752	1,005,024	3,200	2,617,504	.	3,200
8/2	105,792	899,232	3,200	1,710,872	. .	. .
8/3	264,480	423,168	....	2,101,344	....	. .....
8/4	264,480	846,336	....	2,337,024	....	.. .

1913	Bacillaria paradoxa	Cyclotella kützingii	Cyclotella operculata	Cymbella affinis	Cymbella cymbiformis	Cymbella tumida
7/5	....	370,272	13,911,648	....	....	. ..
7/6	....	740,544	8,780,736	....	....	. . .
7/7	....	211,584	11,901,600	....	....	. ...
7/8	....	1,005,024	12,906,624	. .		. .
7/9	....	264,480	12,060,288	....	. . .	. .
7/10	....	581,856	13,858,752	....	....	. . .

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Bacillaria paradoxa	Cyclotella kützingii	Cyclotella operculata	Cymbella affinis	Cymbella cymbiformis	Cymbella tumida
7/11		370,272	13,118,208			
7/12		211,584	16,556,448			
7/13	12,800	476,064	26,448,000			
7/14	158,688	846,336	37,291,680			
7/15	3,200	634,752	36,022,176			3,200
7/16	12,800	423,168	45,331,872			6,400
7/17	6,400	528,960	46,178,208	12,800		
7/18		317,376	31,949,184			
7/19	57,600	264,480	24,014,784			
7/20	6,400	105,792	14,070,336			
7/21	12,800	105,792	16,133,280			3,200
7/22	6,400	105,792	18,672,288			
7/23		158,688	11,584,224		6,400	
7/24		105,792	13,647,168		3,200	
7/25	6,400	211,584	13,964,544			
7/26	211,584	581,856	16,768,032	3,200		
7/27	51,200	793,440	18,143,328			
7/28		952,128	16,820,928			6,400
7/29		317,376	16,397,760			
7/30		952,128	14,916,672			
7/31	12,800	740,544	17,032,512			
8/ 1	12,800	1,163,712	16,186,176			
8/ 2	32,000	1,692,672	13,224,000			
8/ 3	32,000	1,692,672	12,271,872			
8/ 4	158,688	1,269,504	10,579,200			

1913	Epithemia ocellata	Gyrosigma kützingii	Gyrosigma scalproides	Melosira granulata	Melosira varians	Navicula alpestris
7/ 5				1,005,024		
7/ 6				1,745,568	3,200	
7/ 7				1,110,816		
7/ 8				1,481,088		3,200
7/ 9				1,481,088		
7/10				1,798,464		
7/11				2,433,216		
7/12				2,697,696		
7/13			3,200	1,269,504	6,400	
7/14				1,533,984		105,792
7/15				1,216,608		
7/16	6,400			1,586,880		
7/17		3,200	3,200	2,486,112	3,200	
7/18				1,957,152	6,400	
7/19				2,168,736		
7/20				476,064		
7/21				1,163,712		
7/22				2,221,632		
7/23				1,428,192		
7/24				3,226,656		
7/25				1,163,712		6,400
7/26				2,962,176		
7/27				2,327,424		
7/28				3,279,552		
7/29		3,200		2,010,048		
7/30				2,539,008		
7/31				1,904,256		
8/ 1				1,163,712		
8/ 2	6,400	25,600		3,914,304		
8/ 3			6,400	4,707,744		6,400
8/ 4			12,800	3,544,032		

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Navicula bacillum	Navicula gracilis	Nitzschia acicularis	Nitzschia sigma	Nitzschia vernucularis	Pleurostauron parvulum
7/5	3,200		4,284,576			
7/6	3,200	3,200	2,750,592			
7/7			4,337,472			
7/8		105,792	3,967,200			
7/9		3,200	2,909,280			
7/10		158,688	4,760,640	3,200		3,200
7/11		3,200	5,448,288			
7/12	3,200		4,866,432			
7/13		158,688	6,083,040		6,400	
7/14		264,480	5,130,912	3,200		
7/15		105,792	4,496,160	3,200		
7/16	105,792	370,272	5,025,120			
7/17	158,688	370,272	5,183,808	112,192	3,200	
7/18			3,914,304			
7/19		211,584	4,125,888			
7/20		3,200	2,062,944	6,400		
7/21		3,200	2,697,696			
7/22		158,688	2,697,696	3,200		
7/23		3,200	2,380,320			
7/24		105,792	2,909,280	3,200		
7/25		105,792	4,231,680			
7/26		423,168	6,982,272	3,200		
7/27	105,792	476,064	9,309,696	3,200		
7/28		370,272	7,088,064	3,200	6,400	3,200
7/29	3,200	317,376	6,030,144	264,480		3,200
7/30		370,272	3,755,616			
7/31		264,480	4,813,536	19,200		
8/1	105,792	211,584	3,544,032			
8/2	3,200	264,480	3,385,344	6,400		
8/3	3,200	3,200	3,226,656			
8/4	3,200	317,376	3,702,720		6,400	

1913	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium rostratum	Mougeotia sp.
7/5			423,168	20,001,088		
7/6			370,272	14,397,312		
7/7			952,128	18,619,392		
7/8			899,232	20,374,560		
7/9	6,400		476,064	17,204,000		
7/10			581,856	21,749,856		
7/11			370,272	21,743,456		3,200
7/12			423,168	24,761,728		3,200
7/13		5,501,184	740,544	40,709,024		3,200
7/14		5,765,664	637,952	51,741,888	3,200	317,376
7/15	3,200	4,284,576	846,336	47,625,600	3,200	
7/16	3,200	4,496,160	634,752	58,002,816		3,200
7/17	19,200	3,279,552	1,110,816	59,463,008		3,200
7/18	6,400	1,322,400	317,376	39,790,592		
7/19		634,752	317,376	31,801,600		
7/20	12,800	528,960	264,480	17,543,776		6,400
7/21	3,200	528,960	476,064	21,127,904		
7/22	12,800	793,440	370,272	25,045,408		
7/23	3,200	581,856	528,960	16,675,040		3,200
7/24	12,800	370,272	476,064	20,863,424		
7/25	6,400	476,064	211,584	20,387,360	3,200	105,792
7/26	105,792	899,232	687,648	29,637,760		
7/27	12,800	687,648	793,440	32,809,824		158,688
7/28	6,400	476,064	899,232	29,918,240		3,200
7/29	12,800	1,005,024	899,232	27,263,840	3,200	3,200

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Surirella sp.	Synedra radians	Synedra ulna	Total Bacillariaceae	Closterium rostratum	Mougeotia sp.
7/30	6,400	423,168	528,960	23,495,424	3,200	...
7/31	6,400	476,064	370,272	25,745,856	6,400	...
8/ 1	105,792	846,336	423,168	23,766,304	3,200	...
8/ 2	...	370,272	423,168	23,354,240	...	...
8/ 3	12.800	370,272	634,752	22,967,968	...	...
8/ 4	25,600	793,440	211,584	20,630,944	3,200	105,792

1913	Staurastrum *A*	Staurastrum sp.	Total Conjugatae	Total Chlorophyll bearing	Total Algae	Cercomonas crassicauda
7/ 5	3,200	...	6,400	24,657,440	22,693,888	...
7/ 6	...	3,200	3,200	20,518,752	17,699,264	...
7/ 7	...	...	...	25,811,552	22,384,608	...
7/ 8	...	...	...	31,487,424	27,727,104	...
7/ 9	6,400	...	6,400	24,516,656	21,506,480	...
7/10	...	3,200	3,200	31,763,090	27,521,810	...
7/11	...	...	3,200	30,378,304	26,778,176	...
7/12	...	...	3,200	37,862,232	31,667,000	...
7/13	...	...	3,200	56,860,504	48,450,040	...
7/14	...	...	320,576	68,840,096	60,852,800	...
7/15	...	...	3,200	62,240,896	55,047,040	...
7/16	6,400	...	9,600	71,364,608	66,012,512	3,200
7/17	...	...	3,200	72,392,032	67,089,632	...
7/18	3,200	3,200	6,400	48,292,352	42,953,056	...
7/19	...	...	...	43,953,794	36,912,226	...
7/20	...	...	6,400	22,560,800	19,069,664	...
7/21	...	...	...	27,722,208	24,227,872	...
7/22	6,400	...	6,400	30,423,104	27,930,592	...
7/23	...	...	3,200	23,044,054	19,758,112	...
7/24	3,200	3,200	6,400	27,956,192	24,538,848	...
7/25	...	...	108,992	27,893,696	24,190,976	...
7/26	...	3,200	6,400	44,063,882	35,865,002	...
7/27	...	...	158,688	45,490,368	39,133,248	...
7/28	6,400	...	9,600	42,223,606	35,234,934	...
7/29	6,400	...	12,800	39,375,328	32,019,584	...
7/30	...	...	9,600	31,213,344	26,967,864	3,200
7/31	...	...	6,400	33,447,776	29,057,408	...
8/ 1	...	...	3,200	34,225,216	27,821,600	...
8/ 2	...	...	...	30,601,496	25,771,960	...
8/ 3	...	3,200	3,200	32,774,432	27,104,960	...
8/ 4	6,400	3,200	118,592	31,681,322	24,312,778	...

1913	Chilomonas sp.	Chlamydomonas sp.	Chromulina sp.	Eudorina elegans	Euglena viridis	Hemidinium nasutum
7/ 5	...	...	634,752	...	3,200	...
7/ 6	...	...	1,428,192	6,400	...	...
7/ 7	...	...	2,221,632	6,400	3,200	...
7/ 8	...	...	3,385,344	57,600	105,792	...
7/ 9	...	...	2,486,112	19,200	211,584	...
7/10	...	...	3,596,928	3,200	3,200	...
7/11	...	...	3,120,864	3,200	105,792	...
7/12	...	...	4,919,328	6,400	793,440	...
7/13	...	...	6,664,896	...	1,057,920	...
7/14	...	...	7,088,064	158,688	370,272	...
7/15	...	...	6,188,932	...	634,752	...
7/16	...	...	5,183,808	6,400	158,688	...
7/17	...	...	4,866,432	6,400	423,168	...
7/18	...	105,792	4,760,640	...	476,064	...
7/19	...	05,792	6,929,376	...	6,400	...

Table 4.—Plankton Organisms Per Cubic Meter in Stockton Channel, Daily Series in 1913—(*Continued*)

1913	Chilomonas sp.	Chlamydomonas sp.	Chromulina sp.	Eudorina elegans	Euglena viridis	Hemidinium nasutum
7/20			3,015,072		476,064	
7/21			2,856,384		634,752	
7/22			2,274,528	3,200	211,584	
7/23			3,173,760		105,792	
7/24			2,750,592		476,064	
7/25			2,803,488		423,168	
7/26			7,299,648		370,272	
7/27			5,395,392	6,400	634,752	
7/28			6,347,520		423,168	
7/29			4,496,160		423,168	2,327,424
7/30			3,279,552	6,400	423,168	528,960
7/31			3,385,344		158,688	846,336
8/1	3,200		3,649,824		264,480	2,486,112
8/2			3,967,200		105,792	634,752
8/3	3,200		4,919,328		3,200	634,752
8/4		3,200	5,130,912		12,800	1,639,776

1913	Mallomonas sp.	Peridinium cinctum	Pleodorina californica	Pteromonas sp.	Synura uvella	Trachelomona euchlora
7/5	3,200	1,005,024		158,688		
7/6		581,856	6,400	211,584	158,688	
7/7		634,752		32,000		
7/8						
7/9		3,200		32,000		
7/10		105,792				
7/11						
7/12						
7/13						
7/14		264,480				
7/15						
7/16						
7/17	3,200					
7/18						
7/19						
7/20						
7/21						
7/22						
7/23						3,200
7/24				32,000		
7/25		317,376		3,200		
7/26		317,376		105,792		
7/27		105,792		3,200		
7/28		6,400				
7/29		105,792				
7/30		3,200				
7/31						
8/1						
8/2			6,400		3,200	3,200
8/3						
8/4						211,584

1913	Trachelomonas volvocina	Total Mastigophora	Amoeba radiosa	Difflugia pyriformis	Microgromia socialis	Total Rhizopoda
7/5	264,480	2,069,344		211,584		224,384
7/6	317,376	2,819,488	3,200	476,064		479,264
7/7	528,960	3,426,944		264,480	3,200	267,680
7/8	211,584	3,760,320	3,200	12,800		19,200
7/9	264,480	3,016,576		264,480		270,880
7/10	528,960	4,241,280		3,200		3,200

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Trachelomonas volvocina	Total Mastigophora	Amoeba radiosa	Difflugia pyriformis	Microgromia socialis	Total Rhizopoda
7/11	370,272	3,600,128	...	...	...	...
7/12	476,064	6,195,232	...	...	...	3,200
7/13	687,648	8,410,464	...	...	...	3,200
7/14	105,792	7,987,296	...	...	3,200	6,400
7/15	370,272	7,193,856	...	...	...	3,200
7/16	...	5,352,096	...	...	3,200	112,192
7/17	...	5,302,400	...	6,400	...	12,800
7/18	...	5,342,496	...	6,400	...	9,600
7/19	...	7,041,568	...	3,200	...	6,400
7/20	...	3,491,136	...	105,792	...	108,992
7/21	3,200	3,494,336	...	6,400	...	6,400
7/22	...	2,492,512	...	...	...	...
7/23	3,200	3,285,952	...	...	105,792	105,792
7/24	158,688	3,417,344	...	105,792	105,792	370,272
7/25	158,688	3,705,920	...	158,688	...	158,688
7/26	105,792	8,198,880	...	264,480	...	267,680
7/27	211,584	6,357,120	...	211,584	3,200	217,984
7/28	211,584	6,988,672	...	6,400	3,200	12,800
7/29	3,200	7,355,744	...	105,792	...	211,584
7/30	...	4,244,480	...	...	3,200	3,200
7/31	...	4,390,368	...	3,200	...	6,400
8/ 1	...	6,403,616	...	...	...	...
8/ 2	105,792	4,832,736	...	...	...	...
8/ 3	105,792	5,669,472	...	...	158,688	158,688
8/ 4	370,272	7,368,544	...	...	105,792	105,792

1913	Heterophrys fockei	Raphidiophrys elegans	Total Heliozoa	Holophrya sp.	Prorodon sp.	Tintinnidium fluviatile
7/ 5	...	528,960	528,960	158,688	...	...
7/ 6	...	740,544	740,544	105,792	...	...
7/ 7	...	846,336	846,336	158,688	...	...
7/ 8	...	1,110,816	1,110,816	105,792	...	...
7/ 9	...	846,336	846,336	211,584	...	...
7/10	...	370,272	370,272	211,584	...	...
7/11	...	423,168	423,168	423,168	...	...
7/12	...	158,688	158,688	3,200	...	...
7/13	...	1,110,816	1,110,816	211,584	...	...
7/14	...	1,005,024	1,005,024	105,792	...	...
7/15	...	370,272	370,272	528,960	...	...
7/16	...	528,960	528,960	6,400	...	...
7/17	...	158,688	158,688	...	...	...
7/18	...	211,584	211,584	...	...	...
7/19	...	370,272	370,272	...	...	...
7/20	6,400	105,792	112,192	3,200	...	...
7/21	105,792	264,480	310,272	264,480	...	...
7/22	...	317,376	317,376	3,200	...	...
7/23	...	317,376	317,376	...	...	...
7/24	...	317,376	317,376	3,200	3,200	...
7/25	...	105,792	105,792	264,480	...	...
7 26	...	370,272	370,272	211,584	...	...
7/27	...	476,064	476,064	317,376	...	...
7/28	105,792	423,168	528,960	158,688	...	...
7/29	...	528,960	528,960	158,688	...	...
7/30	44,800	370,272	415,072	105,792	...	105,792
7/31	105,792	476,064	581,856	105,792	3,200	105,792
8/ 1	6,400	687,648	694,048	264,480	...	3,200
8/ 2	528,960	1,269,504	1,798,464	105,792	...	...
8/ 3	528,960	740,544	1,269,504	3,200	...	6,400
8/ 4	317,376	952,128	1,269,504	158,688	...	6,400

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Vorticella *B*	Vorticella longifilum	Vorticella sp.	Total Ciliata	Total, Protozoa without Mastigophora	Total, Protozoa with Mastigophora
7/5	3,200		2,644,800	2,806,688	3,560,032	5,629,376
7/6			1,375,296	1,490,688	2,707,496	5,526,984
7/7	158,688		1,057,920	1,216,608	2,330,624	5,757,568
7/8	211,584		1,110,816	1,216,608	2,346,624	6,106,944
7/9	370,272		476,064	687,648	1,804,864	4,821,440
7/10	634,752		1,322,400	1,533,984	1,907,456	6,148,736
7/11	105,792		846,336	1,269,504	1,692,672	5,292,800
7/12	158,688		740,544	743,744	905,632	7,100,864
7/13			634,752	846,336	1,960,352	10,370,816
7/14	105,792		1,163,712	1,269,504	2,280,928	10,268,224
7/15			846,336	1,375,296	1,748,768	8,942,624
7/16	3,200		1,110,816	1,116,216	1,757,368	7,109,464
7/17			1,163,712	1,163,712	1,335,200	6,637,600
7/18			370,272	370,272	591,456	5,933,952
7/19			1,057,920	1,057,920	1,434,592	8,476,160
7/20			476,064	476,064	697,448	4,188,584
7/21			370,272	634,752	951,424	4,445,760
7/22			1,005,024	1,008,224	1,325,600	3,818,112
7/23			476,064	476,064	899,232	4,185,184
7/24			899,232	905,632	1,593,280	5,010,624
7/25			793,440	1,163,712	1,428,192	5,134,112
7/26			1,269,504	1,487,488	2,125,440	10,324,320
7/27			1,957,152	2,274,528	2,968,576	9,325,696
7/28			1,586,880	1,745,568	2,287,328	9,276,000
7/29	476,064	3,200	2,010,048	2,171,936	2,912,480	10,268,224
7/30		6,400	899,232	1,117,216	1,535,488	5,779,968
7/31			1,533,984	1,748,768	2,337,024	6,727,392
8/1			1,269,504	1,537,184	2,231,232	8,634,848
8/2			1,639,776	1,748,768	3,547,232	8,379,968
8/3			1,957,152	1,966,752	4,394,944	10,064,416
8/4		3,200	1,692,672	1,860,950	4,236,246	11,604,790

1913	Rotaria neptunia	Rotaria rotatoria	Rotifer unidentified	Total Bdelloida	Anuraeopsis fissa	Asplanchua brightwelli
7/5		19,200	158,688	177,888		158,688
7/6		25,600	211,584	237,184		57,600
7/7	6,400	6,400	3,200	16,000	3,200	70,400
7/8		12,800	6,400	19,200	6,400	19,200
7/9		6,400	3,200	9,600		19,200
7/10		25,600		25,600	6,400	89,600
7/11	12,800	3,200		16,000		51,200
7/12		211,584	3,200	214,784		44,800
7/13		38,400	158,688	196,088	3,200	76,800
7/14	3,200	264,480	158,688	426,368	3,200	158,688
7/15		6,400	3,200	9,600		64,000
7/16		19,200	19,200	38,400		12,800
7/17		317,376	264,480	581,856		19,200
7/18		6,400	3,200	9,600		105,792
7/19			158,688	158,688		6,400
7/20		6,400	3,200	9,600	6,400	12,800
7/21		19,200		19,200	6,400	19,200
7/22		19,200	3,200	22,400		25,600
7/23		317,376		317,376	6,400	3,200
7/24	6,400	105,792	3,200	115,392	,200	12,800
7/25		6,400	105,792	112,192		
7/26		12,800	25,600	38,400		19,200
7/27	19,200	6,400	105,792	131,392	19,200	38,400
7/28			211,584	211.584	6,400	12,800
7/29			105,792	105,792		32,000

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Rotaria neptunia	Rotaria rotatoria	Rotifer unidentified	Total Bdelloida	Anuraeopsis fissa	Asplanchua brightwelli
7/30	6,400	6,400	3,200	16,000		25,600
7/31	6,400	12,800		19,200	6,400	
8/ 1		3,200	158,688	161,888		18,200
8/ 2		32,000	3,200	41,600		44,800
8/ 3		158,688	3,200	174,688		105,792
8/ 4		6,400	105,792	112,192		12,800

1913	Brachionus angularis	Brachionus angularis caudatus	Brachionus budapestenensis	Brachionus calyciflorus	Brachionus capsuliflorus	Brachionus egg; attached, female
7/ 5	3,200	476,064				158,688
7/ 6	3,200	423,168				105,792
7/ 7	3,200	264,480				105,792
7/ 8		1,269,504				528,960
7/ 9		1,163,712		3,200		687,648
7/10		581,856		6,400		264,480
7/11		1,005,024				317,376
7/12	158,688	1,375,296				528,960
7/13		581,856				317,376
7/14		846,336				687,648
7/15	3,200	740,544				423,168
7/16		793,440				846,336
7/17		1,057,920			19,200	264,480
7/18		1,110,816				370,272
7/19		793,440				476,064
7/20	6,400	476,064				158,688
7/21		370,272	6,400			211,584
7/22	158,688	528,960				581,856
7/23		317,376			6,400	158,688
7/24	3,200	740,544	6,400			476,064
7/25		1,216,608				846,336
7/26		1,481,088		6,400		370,272
7/27	105,792	3,755,616				1,428,192
7/28		1,851,360				634,752
7/29		581,856				211,584
7/30		423,168			6,400	12,800
7/31		264,480			6,400	211,584
8/ 1		581,856				370,272
8/ 2		211,584				264,480
8/ 3		211,584			6,400	105,792
8/ 4	6,400	264,480				158,688

1913	Brachionus egg; attached, male	Brachionus egg; free, female	Brachionus patulus	Brachionus plicatilis	Brachionus urceus	Diurella egg
7/ 5		1,005,024		6,400	44,800	
7/ 6		581,856			6,400	3,200
7/ 7		793,440			12,800	3,200
7/ 8	105,792	1,057,920			19,200	
7/ 9		899,232			44,800	3,200
7/10		1,269,504			211,584	3,200
7/11		846,336			158,688	
7/12		1,005,024	6,400		528,960	
7/13		740,544			370,272	
7/14		528,960			581,856	
7/15		687,648			528,960	
7/16		370,272			528,960	
7/17		476,064			47,064	
7/18		1,005,024			1,216,608	

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Brachionus egg; attached, male	Brachionus egg; free, female	Brachionus patulus	Brachionus plicatilis	Brachionus urceus	Diurella egg
7/19	...	264,480	...	...	370,272	...
7/20	...	423,168	...	...	740,544	...
7/21	...	846,336	...	...	634,752	...
7/22	...	1,057,920	...	...	634,752	...
7/23	...	740,544	...	...	6,400	...
7/24	...	528,960	...	...	211,584	...
7/25	...	1,057,920	...	...	370,272	...
7/26	...	476,064	...	...	423,168	...
7/27	...	1,851,360	...	...	528,960	...
7/28	...	528,960	...	...	528,960	6,400
7/29	...	952,128	3,200	...	370,272	...
7/30	...	423,168	...	...	105,792	...
7/31	...	423,168	...	...	158,688	...
8/1	...	528,960	...	...	423,168	6,400
8/2	...	423,168	...	...	370,272	105,792
8/3	...	158,688	...	...	423,168	6,400
8/4	25,600	317,376	...	6,400	317,376	...

1913	Filinia brachiata	Filinia egg; attached, female	Filinia egg, free	Filinia longiseta	Keratella cochlearis	Keratella egg, attached
7/5	3,200	158,688	370,272	1,375,296	793,440	211,584
7/6	...	105,792	528,960	370,272	211,584	...
7/7	3,200	105,792	317,376	317,376	476,064	3,200
7/8	...	3,200	528,960	264,480	211,584	3,200
7/9	...	3,200	476,064	12,800	211,584	3,200
7/10	...	...	476,064	44,800	423,168	105,792
7/11	...	6,400	423,168	158,688	581,856	3,200
7/12	...	...	370,272	105,792	423,168	3,200
7/13	...	...	3,200	158,688	476,064	105,792
7/14	...	3,200	105,792	211,584	476,064	3,200
7/15	...	...	158,688	...	158,688	3,200
7/16	...	...	...	25,600	12,800	105,792
7/17	...	...	105,792	25,600	32,000	...
7/18	...	...	211,584	...	25,600	...
7/19	...	6,400	105,792	6,400	32,000	211,584
7/20	...	...	105,792	19,200	158,688	...
7/21	...	...	3,200	6,400	158,688	3,200
7/22	...	...	105,792	6,400	105,792	317,376
7/23	...	...	105,792	...	38,400	211,584
7/24	...	...	158,688	...	19,200	264,480
7/25	...	...	211,584	...	12,800	264,480
7/26	...	...	211,584	...	6,400	264,480
7/27	...	...	105,792	...	...	423,168
7/28	...	...	158,688	...	6,400	264,480
7/29	...	...	105,792	...	19,200	687,648
7/30	...	...	158,688	...	12,800	105,792
7/31	...	...	158,688	...	3,200	317,376
8/1	...	...	...	...	...	158,688
8/2	...	...	...	...	...	158,688
8/3	...	...	211,584	...	12,800	3,200
8/4	...	...	158,688	...	...	158,688

1913	Keratella egg, free	Keratella quadrata	Polyarthra trigla	Polyarthra trigla egg, attached	Synchaeta sp.	Trichocerca capucina
7/5	476,064	1,163,712	158,688	...	528,960	...
7/6	264,480	317,376	211,584	...	19,200	...
7/7	105,792	317,376	528,960	...	...	...
7/8	158,688	687,648	740,544	...	...	...
7/9	211,584	264,480	899,232	3,200	12,800	3,200

TABLE 4.—PLANKTON ORGANISMS PER CUBIC METER IN STOCKTON CHANNEL, DAILY SERIES IN 1913—(*Continued*)

1913	Keratella egg, free	Keratella quadrata	Polyarthra trigla	Polyarthra trigla egg, attached	Synchaeta sp.	Trichocerca capucina
7/10	317,376	528,960	1,745,568			
7/11	370,272	687,648	1,798,464	....	....	
7/12	687,648	1,322,400	1,692,672	3,200	3,200	3,200
7/13		1,110,816	1,904,256			
7/14	3,200	1,057,920	1,163,712			
7/15		1,110,816	370,272		3,200	
7/16		952,128	687,648		6,400	
7/17	211,584	687,648	38,400			3,200
7/18	105,792	1,322,400	76,800			
7/19	105,792	846,336	158,688			
7/20	105,792	1,057,920	89,600			
7/21	158,688	846,336	158,688			
7/22	211,584	1,110,816	101,400		12,800	
7/23	....	1,692,672	134,400		6,400	
7/24	105,792	1,163,712	211,584		3,200	
7/25	3,200	2,010,048	476,064			
7/26		2,062,944	634,752			
7/27	158,688	5,554,080	1,216,608	3,200	6,400	
7/28	3,200	2,644,800	581,856		6,400	
7/29	3,200	4,601,952	846,336	3,200		3,200
7/30	3,200	2,010,048	952,128			
7/31	105,792	2,856,384	846,336		6,400	
8/ 1	....	2,909,280	793,440			
8/ 2	105,792	1,110,816	793,440	3,200		
8/ 3		423,168	264,480	6,400		
8/ 4		1,057,920	264,480			

1913	Trichocerca iernis	Total Ploima	Total Rotifera	Bosmina longirostris	Sida	Total Cladocera
7/ 5	19,200	7,111,968	7,289,956		6,400	6,400
7/ 6	19,200	3,229,664	3,466,848		32,000	32,000
7/ 7	158,688	3,590,336	3,606,336		6,400	6,400
7/ 8	317,376	5,921,656	5,940,856			
7/ 9	211,584	5,127,720	5,137,320			
7/10	370,272	6,445,024	6,470,624		6,400	6,400
7/11	476,064	6,884,384	6,900,384		12,800	12,800
7/12	317,376	8,578,056	8,792,840		6,400	6,400
7/13	264,480	6,113,344	6,309,432		12,800	12,800
7/14	105,792	5,940,352	6,367,720			
7/15		4,252,384	4,261,984		6,400	6,400
7/16	6,400	4,348,576	4,386,976			
7/17	3,200	3,419,552	4,001,408	6,400	6,400	12,800
7/18	6,400	5,557,088	5,566,688		12,800	12,800
7/19	6,400	3,390,048	3,548,736		12,800	12,800
7/20	12,800	3,373,856	3,383,456	12,800		12,800
7/21	158,688	3,588,832	3,608,032			
7/22	6,400	4,966,136	4,988,536	12,800	12,800	25,600
7/23		3,428,256	3,745,632			
7/24		3,010,176	3,125,568		12,800	12,800
7/25	158,688	6,069,000	6,181,192		6,400	6,400
7/26	12,800	5,972,352	6,010,752		6,400	6,400
7/27	3,200	15,098,656	15,230,048		6,400	6,400
7/28	6,400	7,241,956	7,453,440			
7/29	6,400	8,434,368	8,540,160			
7/30	19,200	4,255,784	4,271,784	6,400		6,400
7/31	25,600	5,384,096	5,403,296			
8/ 1	25,600	5,816,864	5,978,752			
8/ 2	19,200	3,639,032	3,680,632	6,400	6,400	12,800
8/ 3	12,800	1,958,656	2,133,344	6,400		6,400
8/ 4	6,400	2,859,088	2,971,280		6,400	6,400

Table 4.—Plankton Organisms Per Cubic Meter in Stockton Channel, Daily Series in 1913—(*Concluded*)

1913	Cyclops	Nauplius	Total Copepoda	Total Entomostraca	Glochidia	Total Organisms
7/ 5	268,800	1,057,920	1,326,720	1,333,120	. . . . .	36,946,240
7/ 6	332,800	634,752	967,552	999,552	. . . . .	27,692,648
7/ 7	317,376	528,960	846,336	852,736	. . .	32,601,248
7/ 8	317,376	793,440	1,110,816	1,110,816	. . . . .	40,885,720
7/ 9	370,272	1,163,712	1,533,984	1,533,984	. . . .	32,992,824
7/10	230,400	793,440	1,023,840	1,030,240	. . . . .	41,171,410
7/11	358,400	740,544	1,098,944	1,111,744	.... ..	40,083,104
7/12	740,544	856,336	1,586,880	1,593,280	. . .	49,153,984
7/13	268,800	1,375,296	1,644,096	1,656,896	. . . .	66,787,184
7/14	687,648	1,428,192	2,115,840	2,115,840	. . .	79,604,584
7/15	476,064	1,057,920	1,533,984	1,540,384	.	69,792,032
7/16	454,400	793,440	1,247,840	1,247,840	. .	78,756,792
7/17	264,480	740,544	1,005,024	1,017,824	. . . .	78,746,464
7/18	581,856	581,856	1,163,712	1,176,512	.	55,630,208
7/19	687,648	740,544	1,428,192	1,440,992	6,400	50,284,514
7/20	581,856	899,232	1,481,088	1,493,888	.... . .	28,135,592
7/21	581,856	1,745,568	2,327,424	2,327,424	. . . .	34,609,088
7/22	3,173,760	1,692,672	4,866,432	4,892,032	3,200	41,632,472
7/23	264,480	1,110,816	1,375,296	1,375,296	. . .	29,064,214
7/24	264,480	899,232	1,170,112	1,182,912	. .	33,857,952
7/25	423,168	952,128	1,375,296	1,381,696	. .	36,887,976
7/26	264,480	687,648	952,128	958,528		53,158,602
7/27	476,064	952,128	1,428,192	1,434,592	.	65,123,584
7/28	528,960	793,440	1,322,400	1,322,400	....	53,286,774
7/29	634,752	1,269,504	1,904,256	1,904,256	3,200	52,735,424
7/30	317,376	740,544	1,057,920	1,064,320	3,200	38,088,136
7/31	423,168	581,856	1,005,024	1,005,024	6,400	42,199,520
8/ 1	846,336	899,232	1,745,568	1,745,568	. . . . .	44,180,768
8/ 2	581,856	1,322,400	1,904,256	1,917,056	. . ....	39,749,616
8/ 3	264,480	846,336	1,110,816	1,117,216	. ...	40,419,936
8/ 4	317,376	1,163,712	1,481,088	1,487,488	....	40,376,336

TABLE 5.—PLANKTON ORGANISMS PER CUBIC METER IN SMITH'S CANAL, HOURLY SERIES IN 1913

1913 8/11	Lamprocystis sp.	Total Bacteriaceae	Anabaena sp.	Aphanocapsa sp.	Coelosphaerium kützingianum	Gloeocapsa conglomerata
7 A.M.	....	....	105,792	264,480		52,896
8 A.M.			343,824	158,688		6,400
9 A.M.			52,896	6,400		
10 A.M.			396,720	52,896		105,792
11 A.M.	....		449,616	211,584	52,896	52,896
12 M.	....		449,616	343,824		6,400
1 P.M.	....		502,512	158,688		105,792
2 P.M.			1,163,712	105,792		52,896
3 P.M.			1,719,120	502,512		52,896
4 P.M.	52,896	52,896	1,666,224	211,584		52,896
5 P.M.	52,896	52,896	3,861,408	158,688		
5:48 P.M.	....		3,967,200	105,792		
6:40 P.M.	6,400	6,400	5,236,704	158,688	52,896	158,688

1913 8/11	Gloeocapsa sp.	Gomphosphaera aponina	Microcystis sp.	Nostoc sp.	Oscillatoria sp.	Oscillatoria tenuis
7 A.M.	343,824	52,896	211,584	211,584		
8 A.M.	343,824	....	343,824	52,896		
9 A.M.	264,480		449,616	52,896		
10 A.M.	343,824		158,688	396,720	....	
11 A.M.	343,824		105,792	105,792	158,688	
12 M.	158,688	158,688	661,200	459,616		
1 P.M.	766,992		264,480	52,896		
2 P.M.	661,200	158,688	343,824	3,120,864		
3 P.M.	608,304		343,824	4,522,608		105,792
4 P.M.	608,304		396,720	5,448,288	....	52,896
5 P.M.	925,680		502,512	3,914,304	449,616	
5:48 P.M.	714,096	....	502,512	2,697,696	502,512	
6:40 P.M.	925,680	105,792	449,616	3,306,000	264,480	

1913 8/11	Phormidium foveolarum	Stigonema ocellatum	Total Schizophyceae	Actinastrum hantzschii	Actinastrum hantzschii (large)	Coelastrum microporum
7 A.M.	211,584		1,454,644		105,792	105,792
8 A.M.	158,688	52,896	1,461,040		158,688	105,792
9 A.M.	158,688		984,976		264,480	105,792
10 A.M.			1,454,640		343,824	52,896
11 A.M.	52,896		1,533,984	52,896	502,512	105,792
12 M.	264,480	52,896	2,545,408	6,400	211,584	158,688
1 P.M.	264,480		2,115,840	52,896	449,616	52,896
2 P.M.	343,824		5,871,456	52,896	343,824	6,400
3 P.M.	211,584		8,096,640	52,896	661,200	19,200
4 P.M.	264,480		8,701,394	52,896	264,480	158,688
5 P.M.	264,480	6,400	10,083,088		396,720	52,896
5:48 P.M.	....	52,896	8,542,704	52,896	502,512	211,584
6:40 P.M.			12,040,250	6,400	608,304	264,480

1913 8/11	Pediastrum boryanum	Pediastrum duplex	Pediastrum simplex	Raphidium polymorphum	Raphidium pyrenogerum	Scenedesmus obliquus
7 A.M.		449,616	6,400			52,896
8 A.M.	12,800	766,992	52,896			264,480
9 A.M.	....	396,720				52,896
10 A.M.		449,616	105,792			211,584
11 A.M.		661,200	158,688			52,896
12 M.	12,800	608,304	52,896			
1 P.M.	52,896	1,216,608	6,400		52,896	52,896
2 P.M.	19,200	1,163,712	52,896	105,792		343,824
3 P.M.	12,800	1,110,816	105,792	52,896		343,824
4 P.M.	105,792	925,680	52,896	6,400		211,584
5 P.M.	158,688	1,533,984	12,800			264,480
5:48 P.M.	105,792	1,481,088	25,600			158,688
6:40 P.M.	6,400	1,216,608	6,400	52,896	105,792	158,688

Table 5.—Plankton Organisms per Cubic Meter in Smith's Canal, Hourly Series in 1913—(*Continued*)

1913 8/11	Scenedesmus quadricauda	Schroederia setigera	Total Chlorophyceae	Asterionella gracillima	Amphiprora alata	Bacillaria paradoxa
7 A.M.	158,688	....	673,392	52,896	158,688	264,480
8 A.M.	264,480	....	1,467,440	....	264,480	211,584
9 A.M.	105,792	....	661,200	52,896	502,512	158,688
10 A.M.	211,584	....	1,031,472	....	502,512	211,584
11 A.M.	264,480	105,792	1,295,952	....	502,512	60,800
12 M.	158,688	....	997,776	....	211,584	343,824
1 P.M.	264,480	....	1,751,968	....	343,824	211,584
2 P.M.	449,616	....	2,194,336	....	211,584	396,720
3 P.M.	449,616	....	2,147,840	....	211,584	449,616
4 P.M.	396,720	....	1,910,656	52,896	105,792	343,824
5 P.M.	555,408	....	2,578,256	....	52,896	158,688
5:48 P.M.	588,408	105,792	2,696,848	....	158,688	343,824
6:40 P.M.	925,680	....	2,743,334	....	264,480	158,688

1913 9/11	Cyclotella kützingii	Cyclotella operculata	Cymbella affinis	Cymbella cymbiformis	Cymbella tumida	Epithemia ocellata
7 A.M.	1,428,192	3,808,572	....	....	....	52,896
8 A.M.	1,005,024	4,311,024	....	6,400	52,896	....
9 A.M.	1,322,400	4,178,784	....	....	....	6,400
10 A.M.	1,666,224	3,464,688	....	....	....	....
11 A.M.	1,269,504	2,750,592	....	52,896	....	....
12 M.	819,888	2,697,696	52,896	....	....	....
1 P.M.	1,719,120	3,623,376	....	....	....	....
2 P.M.	1,983,600	4,178,784	52,896	....	6,400	....
3 P.M.	2,195,184	2,856,384	52,896	....	....	....
4 P.M.	2,036,496	3,702,720	105,792	....	....	....
5 P.M.	2,539,008	4,072,992	....	....	12,800	....
5:48 P.M.	1,877,808	4,072,992	....	....	....	....
6:40 P.M.	1,428,192	5,395,392	....	....	....	52,896

1913 8/11	Fragillaria capucina	Gomphonema constrictum	Gyrosigma acuminatum	Gyrosigma kützingii	Gyrosigma scalproides	Melosira granulata
7 A.M.	6,400	....	....	52,896	158,688	10,790,784
8 A.M.	....	....	....	52,896	343,824	10,526,304
9 A.M.	....	....	....	....	158,688	8,436,912
10 A.M.	....	....	....	....	343,824	8,198,880
11 A.M.	....	....	....	....	158,688	8,489,808
12 M.	....	52,896	....	....	52,896	9,568,384
1 P.M.	....	....	....	211,584	343,824	12,668,592
2 P.M.	52,896	....	....	105,792	449,616	19,883,104
3 P.M.	6,400	....	52,896	158,688	819,888	20,655,888
4 P.M.	....	....	....	6,400	766,992	24,067,680
5 P.M.	....	52,896	52,896	396,720	925,680	34,990,704
5:48 P.M.	52,896	....	52,896	52,896	1,057,920	31,737,600
6:40 P.M.	....	....	....	105,792	661,200	35,863,488

1913 8/11	Melosira varians	Navicula alpestris	Navicula bacillum	Navicula didyma	Navicula dubia	Navicula gracilis
7 A.M.	....	....	158,688	52,896	....	1,269,504
8 A.M.	....	6,400	105,792	....	....	1,163,712
9 A.M.	....	....	....	....	12,800	766,992
10 A.M.	52,896	105,792	158,688	52,896	....	1,005,024
11 A.M.	52,896	12,800	....	....	52,896	1,163,712
12 M.	....	52,896	....	....	....	819,888
1 P.M.	....	12,800	105,792	....	....	872,784
2 P.M.	....	....	105,792	....	....	1,163,712
3 P.M.	6,400	52,896	....	....	....	872,784
4 P.M.	....	158,688	52,896	....	....	1,269,504
5 P.M.	6,400	105,792	....	....	....	1,586,880
5:48 P.M.	....	158,688	105,792	....	....	1,216,608
6:40 P.M.	....	52,896	52,896	....	....	2,142,288

TABLE 5.—PLANKTON ORGANISMS PER CUBIC METER IN SMITH'S CANAL, HOURLY SERIES IN 1913—(*Continued*)

1913 8/11	Navicula viridis	Nitzschia acicularis	Nitzschia sigma	Nitzschia vermicularis	Pleurostauron parvulum	Stauroneis phoenicenteron
7 A.M.	...	449,616	52,896	...	...	...
8 A.M.	...	502,512	52,896	52,896	...	...
9 A.M.	...	343,824	158,688	52,896	...	...
10 A.M.	...	158,688	...	6,400	52,896	...
11 A.M.	...	396,720	343,824	...	...	...
12 M.	...	105,792	158,688	...	...	...
1 P.M.	...	264,480	...			52,896
2 P.M.	...	502,512	158,688	52,896	52,896	...
3 P.M.	...	661,200	59,296	105,792	105,792	...
4 P.M.	...	343,824	158,688	52,896	...	...
5 P.M.	...	872,784	211,584	52,896	52,896	52,896
5:48 P.M.	6,400	1,322,400	...	...	52,896	...
6:40 P.M.	6,400	1,877,808	158,688	...	52,896	...

1913 8/11	Surirella sp.	Synedra ulna	Synedra radians	Total Bacillariaceae	Closterium accuminatum	Closterium acerosum
7 A.M.	158,688	158,688	343,824	29,525,024	6,400	6,400
8 A.M.	343,824	211,584	158,688	17,451,424	6,400	6,400
9 A.M.	211,584	396,720	264,480	17,289,844	...	6,400
10 A.M.	60,800	608,304	264,480	17,866,704	...	...
11 A.M.	211,584	396,720	555,408	17,179,664	...	6,400
12 M.	80,000	343,824	105,792	15,688,528	...	...
1 P.M.	158,688	158,688	502,512	21,719,160	...	...
2 P.M.	396,720	211,584	714,096	31,129,904	...	19,200
3 P.M.	608,304	211,584	502,512	31,307,184	...	25,600
4 P.M.	502,512	52,896	714,096	34,769,072	...	6,400
5 P.M.	449,616	105,792	264,480	47,514,016	...	52,896
5:48 P.M.	396,720	396,720	555,408	44,121,664	...	12,800
6:40 P.M.	396,720	714,096	1,375,296	51,818,032	...	...

1913 8/11	Closterium rostratum	Mougeotia sp.	Staurastrum A	Staurastrum sp.	Total Conjugatae	Total Chlorophyll bearing
7 A.M.	6,400	264,480	6,400	52,896	342,966	35,677,850
8 P.M.	6,400	608,304	52,896	...	680,400	24,947,312
9 A.M.	...	608,304	6,400	...	621,104	24,220,324
10 A.M.	52,896	608,304	52,896	...	714,096	25,405,888
11 A.M.	6,400	211,584	105,792	...	330,176	23,936,704
12 M.	...	661,200	12,800	52,896	726,896	25,301,712
1 P.M.	6,400	766,992	52,896	...	826,288	29,217,400
2 P.M.	52,896	343,824	264,480	...	528,960	42,512,800
3 P.M.	52,896	1,057,920	105,792	...	1,242,208	46,497,248
4 P.M.	52,896	872,784	158,688	...	1,090,758	49,945,672
5 P.M.	105,792	1,216,608	52,896		1,428,192	65,839,888
5:48 P.M.	52,896	1,110,816	158,688	...	1,335,200	60,499,184
6:40 P.M.	...	2,089,392	105,792	52,896	2,248,080	73,644,688

1913 8/11	Total Algae	Cercomonas crassicauda	Cercomonas sp.	Chlamydomonas sp.	Chromulina sp.	Eudorina elegaus
7 A.M.	31,996,026	...	...	...	2,750,592	211,584
8 A.M.	21,060,304	...	...	...	2,539,008	343,824
9 A.M.	19,557,124	...	...	...	2,750,592	396,720
10 A.M.	21,066,912	...	...	211,584	2,591,904	396,720
11 A.M.	20,339,776	...	52,896	105,792	1,719,120	105,792
12 M.	19,958,608	...	52,896	...	3,147,312	502,512
1 P.M.	26,413,256	52,896	...	...	1,719,120	211,584
2 P.M.	39,724,656	52,896	...	...	1,877,808	396,720
3 P.M.	42,793,872		...	...	2,142,288	555,408
4 P.M.	46,524,776	52,896	...	...	1,824,912	264,480
5 P.M.	61,656,448	52,896	52,896	555,408	2,089,392	608,304
5:48 P.M.	56,696,516	...	105,792	105,792	2,248,080	555,408
6:40 P.M.	68,856,096	52,896	...	502,512	2,856,384	343,824

TABLE 5.—PLANKTON ORGANISMS PER CUBIC METER IN SMITH'S CANAL, HOURLY SERIES IN 1913—(*Continued*)

1913 8/11	Euglena viridis	Gonium pectorale	Hemidinium nasutum	Mallomonas sp.	Pandorina morum	Peridinium cinctum
7 A.M.	......	6,400	264,480	......	52,896	......
8 A.M.	6,400	......	105,792	......	105,792	......
9 A.M.	......	......	502,512	......	158,688	
10 A.M.	158,688	......	608,304	......	52,896	......
11 A.M.	......	......	396,720	52,896	396,720	......
12 M.	52,896	6,400	396,720	......	264,480	......
1 P.M.	52,896	12,800	158,688	......	158,688	......
2 P.M.	......	......	158,688	......	6,400	......
3 P.M.	......	52,896	105,792	......	52,896	52,896
4 P.M.	......	......	449,616	......	6,400	......
5 P.M.	......	......	158,688	105,792	52,896	52,896
5:48 P.M.	105,792	......	52,896	......	19,200	......
6:40 P.M.	......	......	449,616	......	......	52,896

1913 8/11	Platydorina caudata	Pleodorina californica	Pleodorina illinoisensis	Trachelomonas euchlora	Trachelomonas volvocina	Total Mastigophora
7 A.M.	105,792	25,600	......	52,896	211,584	3,681,824
8 A.M.	12,800	52,896	6,400	......	714,096	3,887,008
9 A.M.	6,400	32,000	6,400	105,792	555,408	4,663,200
10 A.M.	54,400	52,896	......	211,584	608,304	4,338,976
11 A.M.	105,792	158,688	......	......	449,616	3,596,928
12 M.	105,792	60,800	......	......	502,512	5,343,104
1 P.M.	105,792	67,200	......	52,896	211,584	2,804,144
2 P.M.	19,200	158,688	......	......	396,720	2,788,144
3 P.M.	48,000	32,000	......	105,792	555,408	3,703,376
4 P.M.	32,000	25,600	......	52,896	714,096	3,473,792
5 P.M.	19,200	112,000	6,400	158,688	264,480	4,236,336
5:48 P.M.	......	54,400	......	......	555,408	3,802,768
6:40 P.M.	12,800	48,000	......	......	925,680	4,794,992

1913 8/11	Amoeba proteus	Amoeba radiosa	Cyphoderia ampulla	Difflugia pyriformis	Hyalodiscus sp.	Microgromia socialis
7 A.M.	......	......	......	105,792	......	......
8 A.M.	......	......	......	......	......	105,792
9 A.M.	......	52,896	......	......	......	......
10 A.M.	......	......	52,896	52,896	......	......
11 A.M.	......	......	52,896	105,792	......	105,792
12 M.	......	......	......	......	......	105,792
1 P.M.	......	......	......	52,896	105,792	......
2 P.M.	......	......	......	......	52,896	158,688
3 P.M.	......	......	......	......	......	
4 P.M.	......	105,792	......	52,896	......	158,688
5 P.M.		......			396,720	
5:48 P.M.	396,720	......	......		396,720	105,792
6:40 P.M.	396,720	......	......	......	925,680	52,896

1913 8/11	Nebela sp.	Nuclearia simplex	Total Rhizopoda	Actinophrys sol.	Heterophrys fockei	Heterophrys sp.
7 A.M.	......	......	158,688	......	211,584	......
8 A.M.	......	......	211,584	......	211,584	......
9 A.M.	105,792	......	158,688	52,896	52,896	......
10 A.M.	......	......	105,792	......	......	......
11 A.M.	......	......	264,480	52,896	105,792	......
12 M.	......	158,688	264,480	......	52,896	......
1 P.M.	......	52,896	214,584	......	52,896	......
2 P.M.	......	......	211,584	......	396,720	......
3 P.M.	......	105,792	211,584	158,688	343,824	502,512
4 P.M.	......	52,896	370,272	......	502,512	502,512
5 P.M.	......	......	396,720	105,792	449,616	766,992
5:48 P.M.	......	211,584	1,110,816	......	158,688	343,824
6:40 P.M.	105,792	......	1,481,088	......	158,688	396,720

TABLE 5.—PLANKTON ORGANISMS PER CUBIC METER IN SMITH'S CANAL, HOURLY SERIES IN 1913—(*Continued*)

1913 8/11	Raphidiophrys elegans	Total Heliozoa	Cyclidium sp.	Halteria grandinella	Holophrya sp.	Tintinnidium fluviatile
7 A.M.	....	211,584	....	....	264,480	105,792
8 A.M.	105,792	211,584	....	....	661,200	502,512
9 A.M.	....	105,792	....	....	1,005,024	211,584
10 A.M.	....	....	105,792	....	1,824,912	502,512
11 A.M.	....	158,688	....	....	1,428,192	661,200
12 M.	52,896	105,792	....	....	2,195,184	872,784
1 P.M.	105,792	158,688	52,896	....	925,680	264,480
2 P.M.	....	396,720	....	....	555,408	343,824
3 P.M.	....	1,005,024	52,896	....	661,200	105,792
4 P.M.	....	1,005,024	....	....	264,480	52,896
5 P.M.	....	1,322,400	....	52,896	449,616	52,896
5:48 P.M.	....	502,512	....	105,792	52,896	264,480
6:40 P.M.	....	555,408	105,792	....	1,428,192	264,480

1913 8/11	Vorticella *B*	Vorticella sp.	Total Ciliata	Acineta sp.	Total Suctoria	Total Protozoa without Mastigophora
7 A.M.	....	1,322,400	1,692,672	....	....	2,062,944
8 A.M.	....	3,411,792	4,575,514	6,400	6,400	5,005,082
9 A.M.	819,888	1,533,984	2,750,592	....	....	3,015,072
10 A.M.	555,408	2,591,904	5,031,520	....	....	5,137,312
11 A.M.	661,200	2,089,392	4,178,784	....	....	4,601,952
12 M.	1,586,880	2,433,216	5,501,184	....	....	5,871,456
1 P.M.	819,888	1,930,704	3,180,160	6,400	6,400	3,559,832
2 P.M.	396,720	2,036,496	2,935,728	....	....	3,544,032
3 P.M.	158,688	1,772,016	2,829,936	....	....	4,046,544
4 P.M.	158,688	1,428,192	1,745,568	....	....	3,120,864
5 P.M.	211,584	925,680	1,487,488	12,800	12,800	3,219,408
5:48 P.M.	396,720	1,216,608	1,639,776	....	....	3,253,104
6:40 P.M.	343,824	1,375,296	3,226,656	....	....	4,263,144

1913 8/11	Total Protozoa with Mastigophora	Collotheca pelagica	Collotheca sp.	Ptygura sp.	Total Rhizota	Rotaria rotatoria
7 A.M.	5,744,768	....	....	....	....	6,400
8 A.M.	8,892,090	....	....	....	....	....
9 A.M.	7,678,272	....	6,400	....	6,400	....
10 A.M.	9,476,288	....	....	....	52,896	....
11 A.M.	8,198,880	....	....	....	....	6,400
12 M.	11,214,560	....	....	....	....	....
1 P.M.	6,363,976	....	....	....	....	6,400
2 P.M.	6,332,176	....	....	....	....	19,200
3 P.M.	7,749,920	....	6,400	6,400	12,800	52,896
4 P.M.	6,594,656	12,800	....	105,792	118,592	....
5 P.M.	7,455,744	....	6,400	....	6,400	6,400
5:48 P.M.	7,055,872	6,400	6,400	....	12,800	12,800
6:40 P.M.	9,058,136	....	....	....	....	

1913 8/11	Rotifer unidentified	Total Bdelloida	Anureaopsis fissa	Anureaopsis sp.	Asplanchna brightwellii	Asplanchnopus sp.
7 A.M.	158,688	165,088	....	....	6,400	....
8 A.M.	158,688	158,688	52,896	....	....	....
9 A.M.	343,824	343,824	105,792	....	....	....
10 A.M.	158,688	158,688	105,792	....	....	105,792
11 A.M.	502,512	508,912	....	....	....	....
12 M.	343,824	343,824	105,792	....	....	....
1 P.M.	158,688	165,088	52,896	52,896	6,400	105,792
2 P.M.	343,824	363,024	52,896	....	6,400	....
3 P.M.	52,896	122,192	6,400	52,896	6,400	19,200
4 P.M.	105,792	105,792	....	105,792	6,400	6,400
5 P.M.	105,792	112,192	19,200	52,896	....	....
5:48 P.M.	211,584	224,384	....	32,000	....	19,200
6:40 P.M.	158,688	158,688	19,200	52,896	6,400	52,896

Table 5.—Plankton Organisms per Cubic Meter in Smith's Canal, Hourly Series in 1913—(*Continued*)

1913 8/11	Brachionus angularis	Brachionus angularis caudatus	Brachionus budapestinensis	Brachionus calyciflorus	Brachionus capsuliflorus	Brachionus egg; attached, female
7 A.M.		1,216,608		158,688	25,600	
8 A.M.	6,400	2,380,320		396,720	12,800	52,896
9 A.M.		2,380,320	6,400	264,480	41,600	
10 A.M.		1,930,704		264,480	105,792	264,480
11 A.M.	52,896	1,163,712	6,400	158,688	67,200	52,896
12 M.		3,253,104		211,584	105,792	52,896
1 P.M.		1,666,224	52,896	80,000	12,800	52,896
2 P.M.	52,896	925,680		140,800	19,200	158,688
3 P.M.		555,408		158,688	6,400	
4 P.M.		714,096		105,792	52,896	211,584
5 P.M.		766,992		80,000	25,600	211,584
5:48 P.M.		1,163,712	6,400	105,792	25,600	264,480
6:40 P.M.		1,586,880	52,896	158,688	25,600	396,720

1913 8/11	Brachionus egg; attached, male	Brachionus egg; free, female	Brachionus egg, winter	Brachionus male	Brachionus patulus	Brachionus plicatilis
7 A.M.		608,304			6,400	
8 A.M.	105,792	1,057,920				
9 A.M.	52,896	343,824	264,480		6,400	
10 A.M.		661,200	105,792		12,800	52,896
11 A.M.		343,824		52,896		
12 M.		766,992			12,800	52,896
1 P.M.		158,688				
2 P.M.		105,792			52,896	
3 P.M.		52,896			6,400	
4 P.M.					25,600	
5 P.M.	32,000	105,792			6,400	
5:48 P.M.	52,896	608,304				
6:40 P.M.	52,896	343,824		6,400	6,400	

1913 8/11	Brachionus urceus	Brachionus with parasites	Diurella egg	Filinia egg, free	Filinia longiseta	Keratella cochlearis
7 A.M.		6,400	158,688	661,200		52,896
8 A.M.	25,600			714,096		
9 A.M.	6,400	105,792	211,584	555,408	52,896	
10 A.M.				555,408	6,400	12,800
11 A.M.			52,896	396,720		
12 M.			158,688	766,992		6,400
1 P.M.	6,400		158,688	502,512		
2 P.M.	158,688		105,792	449,616		6,400
3 P.M.	52,896		52,896	105,792		
4 P.M.	6,400		52,896	158,688		
5 P.M.	48,000		158,688	396,720		
5:48 P.M.	12,800		264,480	449,616		6,400
6:40 P.M.	158,688		211,584	608,304		

1913 8/11	Keratella egg, attached	Keratella egg, free	Keratella quadrata	Polyarthra trigla	Polyarthra trigla egg; attached, female	Rotifer egg, winter
7 A.M.	52,896	396,720	211,584	766,992		52,896
8 A.M.		396,720	396,720	1,586,880		6,400
9 A.M.	52,896	502,512	343,824	2,248,080		105,792
10 A.M.		766,992	502,512	1,322,400		105,792
11 A.M.		449,616	264,480	1,877,808		52,896
12 M.		819,888	264,480	1,824,912	52,896	264,480
1 P.M.		502,512	60,800	1,005,024		105,792
2 P.M.		819,888	211,584	1,269,504		52,896
3 P.M.		661,200	67,200	1,269,504	105,792	158,688
4 P.M.		264,480	52,896	608,304	158,688	52,896
5 P.M.	6,400	608,304	52,896	766,992	52,896	52,896
5:48 P.M.		714,096	158,688	1,057,920	105,792	52,896
6:40 P.M.	52,896	925,680	264,480	872,784	52,896	25,600

TABLE 5.—PLANKTON ORGANISMS PER CUBIC METER IN SMITH'S CANAL, HOURLY SERIES IN 1913—(*Concluded*)

1913 8/11	Synchaeta sp.	Trichocerca capucina	Trichocerca iernis	Total Ploima	Total Rotifera	Bosmina longirostris
7 A.M.	....	....	158,688	4,564,560	4,729,648	52,896
8 A.M.	52,896	....	158,688	7,466,640	7,615,328	....
9 A.M.	52,896	....	343,824	4,846,384	5,196,608	52,896
10 A.M.	....	52,896	264,480	7,199,408	7,410,992	....
11 A.M.	52,896	....	714,096	5,759,920	6,268,832	....
12 M.	6,400	12,800	766,992	9,612,576	9,956,400	....
1 P.M.	....	....	343,824	4,979,936	5,145,024	52,896
2 P.M.	6,400	....	211,584	4,817,607	5,180,631	....
3 P.M.	6,400	....	211,584	3,575,840	3,704,432	....
4 P.M.		....	32,000	2,721,600	2,852,992	6,400
5 P.M.	....	52,896	25,600	3,512,752	3,631,344	6,400
5:48 P.M.	158,688	....	211,584	5,471,152	5,708,336	....
6:40 P.M.		....	264,480	6,199,188	7,357,876	6,400

1913 8/11	Sida	Total Cladocera	Cyclops	Nauplius	Total Copepoda	Total Entomostraca	Total Organisms
7 A.M.	52,896	105,792	158,688	158,688	317,376	423,168	42,893,610
8 A.M.	12,800	12,800	86,400	158,688	245,088	257,888	37,825,610
9 A.M.	12,800	65,696	86,400	105,792	192,192	257,888	32,689,892
10 A.M.	25,600	25,600	54,400	158,688	213,088	238,688	38,192,880
11 A.M.	6,400	6,400	73,600	80,000	153,600	160,000	34,967,488
12 M.	19,200	19,200	54,400	211,584	265,984	285,184	41,414,752
1 P.M.	....	52,896	25,600	86,400	112,000	164,896	38,087,152
2 P.M.	19,200	19,200	80,000	92,800	172,800	192,000	51,429,463
3 P.M.	52,896	52,896	60,800	12,800	73,600	126,496	54,374,720
4 P.M.	52,896	52,896	60,800	52,896	113,696	172,992	56,092,520
5 P.M.	....	6,400	99,200	105,792	204,992	211,584	72,902,032
5:48 P.M.	6,400	6,400	99,200	52,896	152,096	158,496	69,619,120
6:40 P.M.	12,800	19,200	140,800	105,792	246,592	265,792	85,531,500

TABLE 6.—VOLUMES OF CATCHES, 1913

Date 1913	Volume in cubic centimeter per ¼ cubic meter			Estimated percentage of plankton			Number of hauls			Number of forms recorded		
	I	II	III	I	II	III	I	II	III	I	II	III
1/ 5	0.5	0.4		50%	40%		13	7		30	31	
1/ 8	0.55			50%			13			28		
1/11			0.55			40%			25			24
1/12	0.35	0.25		30%	50%		13	7		30	37	
1/15	0.8			60%			13			42		
1/19	0.55	0.35	0.55	60%	60%	40%	8	7	13	43	45	41
1/22	0.6			60%			9			56		
1/25		0.65	0.45		70%	50%		6	25		60	46
1/26	1.0						9			39		
1/29	0.8			90%			8			46		
2/ 2	0.85	0.65	0.6	85%	75%	80%	9	7	13	45	50	51
2/ 5	0.95			85%			9			48		
2/ 8	1.0	0.85	0.6	80%	70%	80%	9	7	13	46	49	45
2/12	1.7			85%			10			50		
2/15	1.0	0.75	0.65	80%	60%	80%	9	7	13	54	50	59
2/19	0.85			60%			9			61		
2/23	1.55	0.65	0.6	70%	60%	70%	9	7	13	60	62	64
2/26	1.65			60%			13			59		
3/ 1	1.4	0.65	0.75	85%	40%	50%	9	7	13	55	52	57
3/ 5	3.95			85%			13			46		
3/ 8	5.2	1.4	0.65	85%	10%	50%	9	7	13	48	52	60
3/12	6.8			80%			16			43		
3/15	1.8	1.95	0.8	90%	15%	50%	10	7	13	55	58	70
3/19	2.1			80%			13			56		
3/23	1.9	0.8	0.8	85%	10%	60%	9	7	13	63	74	70
3/26	1.8			85%			13			51		
3/29	1.85	0.7	1.0	80%	15%	40%	9	7	13	54	78	72
4/ 2	2.5			90%			9			57		
4/ 5	2.7	1.7	0.55	90%	15%	40%	9	5	13	58	75	71
4/ 9	2.4			95%			9			54		
4/13	1.85	0.5	0.75	95%	15%	20%	9	5	12	62	70	67
4/16	2.2			80%			10			56		
4/19	2.65	1.85	0.7	90%	10%	75%	13	5	13	47	58	61
4/23	2.2			85%			9			65		
4/26	3.1	0.8	0.55	90%	20%	25%	13	5	13	70	68	71
4/30	2.3			80%			9			51		
5/ 3	2.1	3.05	0.65	65%	4%	50%	9	5	13	53	58	63
5/ 7	2.6			90%			9			55		
5/10	3.0	6.6	0.55	95%	4%	80%	9	6	12	64	47	56
5/14	2.8			90%			9			51		
5/17	3.4	5.6	0.65	10%	4%	55%	9	6	13	65	64	70
5/21	2.25			85%			9			49		
5/24	2.75	6.0	0.6	50%	5%	50%	8	5	9	59	59	58
5/27	2.95			80%			9			58		
5/31	3.6	6.7	0.7	80%	2%	90%	9	3	13	53	52	46
6/ 3	2.9			95%			9			58		
6/ 7	2.4	3.15	0.5	95%	5%	45%	9	3	9	54	60	66
6/11	2.8			55%			9			50		
6/16	1.85	1.9	0.6	65%	4%	50%	9	6	13	65	63	61
6/18	2.65			85%			9			56		
6/21	2.8	1.2	0.6	90%	10%	60%	9	7	13	57	68	78
6/25	3.45			92%			13			72		
6/28	3.1	1.95	0.75	92%	15%	65%	13	9	13	61	77	72
7/ 3	2.7			80%			9			56		
7/ 5	3.05	0.95	0.7	93%	30%	65%	9	9	13	63	66	72
7/ 9	2.7			85%			9			59		
7/12	3.85	2.1	1.7	90%	40%	85%	9	9	13	55	82	94
7/16	3.9			92%			9			57		

TABLE 6.—VOLUMES OF CATCHES, 1913—(*Concluded*)

Date 1913	Volume in cubic centimeter per ¼ cubic meter			Estimated percentage of plankton			Number of hauls			Number of forms recorded		
	I	II	III	I	II	III	I	II	III	I	II	III
7/19	4.1	1.7	0.95	85%	60%	80%	9	9	13	50	66	60
7/23	3.9			85%			9			52		
7/26	4.3	1.4	1.65	90%	90%	50%	9	10	13	63	70	83
7/30	4.5			92%			9			61		
8/ 2	4.2	2.3	1.35	90%	80%	90%	9	9	13	66	88	76
8/ 6	4.5			93%			9			52		
8/ 9	4.7	2.4	2.85	95%	75%	50%	9	9	13	63	83	98
8/13	4.75			75%			9			75		
8/15	5.1	2.3	1.4	80%	80%	70%	9	9	13	72	98	44
8/20	6.1			60%			9			68		
8/23	4.1	2.0	4.6	80%	85%	80%	9	8	13	71	86	92
8/27	4.6			95%			9			65		
8/31	5.2	2.9	1.7	85%	90%	80%	9	8	13	58	84	78
9/ 2	4.4			85%			9			71		
9/ 6	3.8	2.0	2.8	55%	90%	80%	9	8	13	67	66	85
9/ 9	3.9			85%			9			68		
9/13	3.9	2.5	1.75	75%	55%	85%	9	9	13	63	81	79
9/17	3.2			80%			9			63		
9/20	2.0	1.9	1.9	95%	85%	95%	9	9	13	58	78	67
9/24	1.8			95%			9			73		
9/27	3.15	2.5	1.55	95%	30%	90%	9	9	13	63	70	76
10/ 1	2.4			80%			9			69		
10/ 4	2.05	1.65	1.8	85%	30%	55%	9	7	13	67	74	72
10/ 8	2.7			75%			9			79		
10/11	2.45	2.1	1.55	85%	30%	40%	9	8	13	70	74	73
10/15	4.6			20%			9			78		
10/18	1.7	1.25	1.45	50%	30%	40%	9	8	13	57	68	53
10/22	2.3			50%			9			69		
10/26	1.65	1.2	1.35	60%	25%	40%	9	9	13	57	62	75
10/29	1.6			60%			9			78		
11/ 2	1.15	1.2	1.2	60%	30%	50%	9	9	13	64	76	71
11/ 5	0.9			25%			9			54		
11/ 8	0.5	1.3	1.5	40%	20%	15%	9	9	19	44	57	66
11/12	1.25			30%			9			69		
11/15	0.6	0.8	0.6	30%	25%	45%	9	9	13	56	64	65
11/19	1.35			15%			13			83		
11/22	1.3	0.7	0.95	15%	15%	20%	9	9	13	77	67	81
11/26	1.15			40%			9			64		
11/30	1.35	1.1	0.6	15%	45%	25%	12	9	13	73	57	62
12/ 3	1.3			40%			13			72		
12/ 6	0.9	0.8	1.1	50%	50%	35%	9	8	13	64	46	61
12/10	0.9			15%			7			66		
12/14	0.7	0.8	0.85	15%	25%	25%	12	7	17	71	49	52
12/17	0.8			20%			7			63		
12/20	1.9	0.5	0.65	15%	25%	20%	9	7	17	67	56	40
12/24	0.55			25%			7			78		
12/27	1.0	1.30	0.7	15%	15%	10%	9	7	13	71	54	51
12/31	0.95			20%			9			59		

Daily, Station I.					Hourly, Station IIIa.				
Date 1913	Volume in cubic centimeter per ¼ cubic meter	Estimated percentage of plankton	Number of hauls	Number of forms	Date 1913 8/11	Volume in cubic centimeter per ¼ cubic meter	Estimated percentage of plankton	Number of hauls	Number of forms
7/ 5	3.05	93%	9	63					
7/ 6	2.5	70%	9	57					
7/ 7	3.2	75%	9	54					
7/ 8	3.6	80%	9	55					
7/ 9	2.7	85%	9	59					
7/10	3.4	90%	9	54					
7/11	4.1	85%	9	45	7 A.M.	2.4	50%	6	76
7/12	3.85	90%	9	55	8 A.M.	2.3	60%	6	74
7/13	5.05	92%	12	56	9 A.M.	2.3	70%	6	75
7/14	4.35	80%	9	64	10 A.M.	2.5	50%	6	73
7/15	4.40	90%	10	55	11 A.M.	2.4	50%	6	79
7/16	3.9	92%	9	57	12 M.	2.4	75%	6	78
7/17	4.65	50%	10	50	1 P.M.	2.07	80%	6	81
7/18	6.4	90%	13	50	2 P.M.	2.07	75%	6	80
7/19	4.1	85%	9	50	3 P.M.	2.07	85%	6	91
7/20	4.9	92%	9	52	4 P.M.	2.07	85%	6	86
7/21	4.3	92%	9	54	5 P.M.	2.3	80%	6	94
7/22	4.2	92%	13	56	5:48 P.M.	2.3	85%	6	86
7/23	3.9	85%	9	52	6:40 P.M.	2.5	80%	6	93
7/24	3.35	95%	9	64					
7/25	3.85	92%	9	57					
7/26	4.3	90%	9	63					
7/27	5.8	95%	13	67					
7/28	4.45	95%	9	62					
7/29	4.3	95%	9	64					
7/30	4.5	92%	9	61					
7/31	4.2	90%	9	59					
8/ 1	3.8	92%	9	53					
8/ 2	4.2	90%	9	66					
8/ 3	3.7	95%	9	64					
8/ 4	3.6	95%	9	65					

TABLE 7.

Date 1913	Time of first collection	Temperature centigrade				Air conditions	Water conditions	Anchor or drift	Number of hauls		
			I	II	III				I	II	III
1/ 1	3:30 P.M.	Air				Clear		a	13		
		Water									
1/ 5	4:00 P.M.	Air		4.5		High wind; clear	Rough	a		7	
		Water		4							
1/ 8	5:00 P.M.	Air	2.5			Wind; sleet	Choppy	a	13		
		Water	5.5								
1/11	3:00 P.M.	Air			6.5	Wind; cloudy	Choppy	a			25
		Water			4						
1/12	2:00 P.M.	Air	13	15		Wind; clear	Choppy	a	13	7	
		Water	6.5	13							
1/15	4:00 P.M.	Air	9			Cloudy		a	13		
		Water	7								
1/19	11:00 A.M.	Air	8	11	9.5	Wind; clear	Choppy	d	8	7	13
		Water	8.5	8	8						
1/22	4:00 P.M.	Air	9.5			No wind; rain	Smooth	d	9		
		Water	10								
1/25	2:00 P.M.	Air		17	19	No wind; clear	Smooth	d		6	25
		Water		8	10						
1/26	10:00 A.M.	Air	14			No wind; clear	Smooth	d	9		
		Water	10								
1/29	4:00 P.M.	Air	17.5			Light wind; clear	Wavy	d	8		
		Water	11.5								
2/ 2	11:30 A.M.	Air	14	17.5	17	Breeze; clear	Ripply	d	9	7	13
		Water	11	10	10						
2/ 5	4:00 P.M.	Air	16.5			No wind; cloudy	Smooth	d	9		
		Water	12.5								
2/ 8	10:30 A.M.	Air	15	15	16	Light wind; rain	Wavy	d	9	7	13
		Water	14.5	10.5	11.5						
2/12	4:00 P.M.	Air	19			Breeze; clear	Ripply	d	10		
		Water	15.5								
2/15	10:00 A.M.	Air	18	19	15.5	No wind; clear	Smooth	d	9	7	13
		Water	15	13.5	13						
2/19	4:00 P.M.	Air	14.5			High wind; clear	Rough	a	9		
		Water	12.5								
2/23	9:00 A.M.	Air	10	12	13	High wind;	Rough	a	9	7	13
		Water	11.5	9	9	part cloudy					
2/26	4:00 P.M.	Air	13			High wind; cloudy	Rough	a	13		
		Water	12								
3/ 1	1:00 P.M.	Air	13.5	15	15	Light wind; cloudy	Wavy	a	9	7	13
		Water	13	10	10						
3/ 5	4:00 P.M.	Air	23.5			Light wind; clear	Wavy	a	13		
		Water	15								
3/ 8	9:30 A.M.	Air	23	21.5	22.5	Light wind; clear	Wavy	a	9	7	13
		Water	18	15	15						
3/12	4:00 P.M.	Air	17.5			Light wind; clear	Wavy	a	16		
		Water	16.5								
3/15	9:00 A.M.	Air	14.5	12	11.5	Breeze; clear	Ripply	a	10	7	13
		Water	14.5	12	12						
3/19	4:00 P.M.	Air	14.5			High wind;	Rough	a	13		
		Water	14.5			part cloudy					
3/23	9:00 A.M.	Air	12	9.5	13	Wind; cloudy	Choppy	a	9	7	13
		Water	14	12	12.5						
3/26	4:30 P.M.	Air	18			Breeze; clear	Ripply	a	13		
		Water	14.5								
3/29	9:00 A.M.	Air	20	17	18.5	Wind; clear	Choppy	a	9	7	13
		Water	12	13	14.5						
4/ 2	4:30 P.M.	Air	18			Light wind; clear	Wavy	a	9		
		Water	17								

TABLE 7.—(*Continued*)

Date 1913	Time of first collection	Temperature centigrade				Air conditions	Water conditions	Anchor or drift	Number of hauls		
			I	II	III				I	II	III
4/ 5	9:00 A.M.	Air	15.5	13.5	15	Wind; cloudy	Choppy	a	9	5	13
		Water	18	14.5	15						
4/ 9	12:00 M.	Air	24			Breeze; clear	Ripply	a	9		
		Water	18								
4/13	9:00 A.M.	Air	18.5	16.5	17	Breeze; part cloudy	Ripply	a	9	5	12
		Water	18.5	17.5	17.5						
4/16	4:00 P.M.	Air	24			Breeze; clear	Ripply	a	10		
		Water	20								
4/19	9:00 A.M.	Air	21	18	19	Breeze; clear	Ripply	a	13	5	13
		Water	19	15	16.5						
4/23	4:00 P.M.	Air	25			Breeze; clear	Ripply	a	9		
		Water	20								
4/26	9:00 A.M.	Air	26.5	23.5	24.5	Breeze; clear	Ripply	a	13	5	13
		Water	20	18.5	19						
4/30	4:00 P.M.	Air	20			Wind; clear	Choppy	a	9		
		Water	19								
5/ 3	8:45 A.M.	Air	23	21	22	Light wind; clear	Wavy	a	9	5	13
		Water	18	14	16						
5/ 7	11:00 A.M.	Air	22			Light wind; clear	Wavy	a	9		
		Water	20								
5/10	9:00 A.M.	Air	22	21.5	21.5	Wind; part cloudy	Choppy	a	9	6	12
		Water	21	17	20.5						
5/14	4:00 P.M.	Air	26			Wind; clear	Choppy	a	9		
		Water	21								
5/17	12:00 M.	Air	26	25	26	Wind; cloudy	Choppy	a	9	6	13
		Water	21	19	19						
5/21	4:00 P.M.	Air	27.5			Light wind; part cloudy	Wavy	a	9		
		Water	23								
5/24	9:00 A.M.	Air	26.5	27	25.5	Light wind; clear	Wavy	a	8	5	9
		Water	23	19.5	21						
5/27	4:00 P.M.	Air	18			Light wind; rain	Wavy	a	9		
		Water	23								
5/31	12:00 M.	Air	31	30.5	32	Breeze; clear	Ripply	a	9	3	13
		Water	27	19.5	27						
6/ 3	5:30 P.M.	Air	22.5			Breeze; cloudy	Ripply	a	9		
		Water	25								
6/ 7	9:00 A.M.	Air	23	23.5	22.5	Wind; part cloudy	Choppy	a	9	3	9
		Water	25	20.5	22.5						
6/11	4:00 P.M.	Air	29			Wind; clear	Choppy	a	9		
		Water	23								
6/16	6:45 A.M.	Air	21			No wind; clear	Smooth	d	9		
		Water	20								
6/16	4:00 P.M.	Air		27	24	Wind; clear	Choppy	d		6	13
		Water		21	21						
6/18	1:00 P.M.	Air	25			Breeze; cloudy	Ripply	d	9		
		Water	22								
6/21	9:00 A.M.	Air	30	28.5	28	Wind; clear	Choppy	d	9	7	13
		Water	23.5	26.5	29						
6/25	1:30 P.M.	Air	22			High wind; part cloudy	Rough	d	13		
		Water	22.5								
6/28	9:00 A.M.	Air	23.5	21	22.5	Wind; clear	Choppy	d	13	9	13
		Water	23	20	20.5						
7/ 3	9:00 A.M.	Air	24			Wind; clear	Choppy	d	9		
		Water	23.5								
7/ 5	9:00 A.M.	Air	32	28.5	30.5	No wind; hazy	Smooth	d	9	9	13
		Water	26	23.5	25						
7/ 9	10:30 A.M.	Air	31			Light wind; clear	Ripply	d	9		
		Water	26								

TABLE 7.—(*Continued*)

Date 1913	Time of first collection	Temperature centigrade				Air conditions	Water conditions	Anchor or drift	Number of hauls		
			I	II	III				I	II	III
7/12	8:40 A.M.	Air	32	32		No wind; clear	Smooth	d	9	9	13
		Water	27	25							
7/16	10:45 A.M.	Air	28			Breeze; clear	Ripply	a	9		
		Water	26								
7/19	10:00 A.M.	Air	29	26	27.5	Breeze; hazy	Ripply	a	9	9	13
		Water	27	24	25						
7/23	10:30 A.M.	Air	27			Breeze; light rain	Ripply	a	9		
		Water	25								
7/26	9:00 A.M.	Air	26.5	22.5	24.5	Breeze; part cloudy	Ripply	d	9	10	13
		Water	26	23	24.5						
7/30	10:40 A.M.	Air	27.5			Breeze; hazy	Ripply	a	9		
		Water	25.5								
8/ 2	8:45 A.M.	Air	27.5	25.5	26.5	No wind; clear	Smooth	a	9	9	13
		Water	26	24	25						
8/ 6	10:30 A.M.	Air	33			Breeze; clear	Ripply	a	9		
		Water	27								
8/ 9	8:45 A.M.	Air	29	24.5	25	Breeze; part cloudy	Ripply	a	9	9	13
		Water	27	25	25.5						
8/13	11:00 A.M.	Air	24			Light wind; clear	Wavy	a	9		
		Water	26.5								
8/15	9:00 A.M.	Air	22.5	23.5	24	Breeze; hazy	Ripply	a	9	9	13
		Water	23.5	23	24						
8/20	11:30 A.M.	Air	32.5			Breeze; hazy	Ripply	a	9		
		Water	26								
8/23	8:40 A.M.	Air	33	29	32.5	Breeze; hazy	Ripply	a	9	8	13
		Water	28	24.5	25						
8/27	11:00 A.M.	Air	32.5			No wind; cloudy	Smooth	a	9		
		Water	27								
8/30	8:45 A.M.	Air	33	30.5	31.5	Breeze; hazy	Ripply	a	9	8	13
		Water	28	26	27						
9/ 2	12:00 M.	Air	24			Breeze; part cloudy	Ripply	a	9		
		Water	26.5								
9/ 6	9:15 A.M.	Air	30	26.5	27.5	Breeze; hazy	Ripply	a	9	8	13
		Water	26	24	24						
9/ 9	12:40 P.M.	Air	28			Breeze; hazy	Ripply	a	9		
		Water	26								
9/13	9:00 A.M.	Air	24.5	21	23	Breeze; clear	Ripply	a	9	9	13
		Water	25	23.5	23.5						
9/17	5:00 P.M.	Air	33.5			No wind; clear	Smooth	a	9		
		Water	27								
9/20	9:00 A.M.	Air	23.5	22.5	23	Breeze; cloudy	Ripply	a	9	9	13
		Water	26	23.5	23.5						
9/24	5:00 P.M.	Air	24.5			Breeze; clear	Ripply	a	9		
		Water	22.5								
9/27	7:30 A.M.	Air	23.5	21.5	20.5	Breeze; clear	Ripply	a	9	9	13
		Water	22	20.5	20.5						
10/ 1	4:15 P.M.	Air	29			Breeze; clear	Ripply	a	9		
		Water	22								
10/ 4	8:00 A.M.	Air	20	19	17	Breeze; clear	Ripply	a	9	7	13
		Water	21	20	20						
10/ 8	5:00 P.M.	Air	18.5			Wind; clear	Choppy	a	9		
		Water	19.5								
10/11	7:00 A.M	Air	22	21.5	14	No wind; clear	Smooth	a	9	8	13
		Water	19.5	17	17						
10/15	5:00 P.M.	Air	21			No wind; clear	Smooth	a	9		
		Water	18.5								
10/18	8:00 A.M.	Air	23.5	19.5	19	No wind; clear	Smooth	a	9	8	13
		Water	19	17.5	17						

TABLE 7.—(*Concluded*)

Date 1913	Time of first collection	Temperature centigrade				Air conditions	Water conditions	Anchor or drift	Number of hauls		
			I	II	III				I	II	III
10/22	5:00 P.M.	Air	25			No wind; clear	Smooth	a	9		
		Water	20								
10/26	2:00 P.M.	Air	22.5	27	24	Breeze; clear	Ripply	d	9	9	13
		Water	19	18	18						
10/29	4:30 P.M.	Air	16			Breeze; cloudy	Ripply	a	9		
		Water	19								
11/ 2	10:00 A.M.	Air	19	19.5	17.5	No wind; cloudy	Smooth	a	9	9	13
		Water	19.5	17	17						
11/ 5	4:30 P.M.	Air	17			No wind; cloudy	Smooth	a	9		
		Water	18.5								
11/ 8	10:00 A.M.	Air	20	17	18	No wind; cloudy	Smooth	a	9	9	19
		Water	19.5	16.5	17						
11/12	4:45 P.M.	Air	13			Wind; cloudy	Choppy	a	9		
		Water	17.5								
11/15	8:45 A.M.	Air	16	12	13	No wind; fog	Smooth	a	9	9	13
		Water	17.5	15.5	15						
11/19	5:45 P.M.	Air	14.5			Wind; cloudy	Choppy	a	13		
		Water	16								
11/22	11:00 A.M.	Air	15	13	12.5	Breeze; clear	Ripply	a	9	9	13
		Water	15	12	13						
11/26	7:30 A.M.	Air	9			No wind; cloudy	Smooth	a	9		
		Water	13								
11/30	1:00 P.M.	Air	13	14	13	Wind; clear	Choppy	a	12	9	13
		Water	13	10	11						
12/ 3	4:45 P.M.	Air	14			No wind; clear	Smooth	a	13		
		Water	10								
12/ 6	11:00 A.M.	Air	6.5	4.5	6	No wind; fog	Smooth	a	9	8	13
		water	11	7.5	8						
12/10	4:30 P.M.	Air	8			No wind; fog	Smooth	a	7		
		Water	9								
12/14	11:00 A.M.	Air	13.5	14	14	Wind; clear	Choppy	a	12	7	17
		Water	12	9	9.5						
12/17	4:30 P.M.	Air	10			No wind; cloudy	Smooth	a	7		
		Water	12								
12/20	2:00 P.M.	Air	9	9.5	9.5	No wind; cloudy	Smooth	a	9	7	17
		Water	11.5	8.5	9						
12/24	2:00 P.M.	Air	12			Light wind; cloudy	Wavy	a	7		
		Water	13								
12/27	10:00 A.M.	Air	9	9.5	9	Light wind; cloudy	Wavy	a	9	7	13
		Water	11.5	9	9						
12/31	11:00 A.M.	Air	16			High wind; cloudy	Rough	a	9		
		Water	11.5								
Average for the year		Air	20.6	19.5	19.6						
		Water	19	16.7	17.3						

TABLE 8.—DAILY COLLECTIONS STATION I

Date 1913	Time of first collection	Temperature centigrade		Air conditions	Water conditions	Anchor or drift	Number of hauls
7/ 5	11:20 A.M.	Air Water	32 26	No wind; hazy	Smooth	d	9
7/ 6	9:30 A.M.	Air Water	32.5 26	No wind; clear	Smooth	d	9
7/ 7	8:30 A.M.	Air Water	29.5 26	Breeze; clear	Ripply	d	9
7/ 8	1:30 P.M.	Air Water	34.5 27	Wind; hazy	Choppy	d	9
7/ 9	10:30 A.M.	Air Water	31 26	Light wind; clear	Wavy	d	9
7/10	10:45 A.M.	Air Water	32 26	Wind; hazy	Choppy	d	9
7/11	10:45 A.M.	Air Water	35 26.5	Breeze; clear	Ripply	d	9
7/12	10:55 A.M.	Air Water	32 27	No wind; clear	Smooth	d	9
7/13	12:00 M.	Air Water	29.5 27	Wind; clear	Choppy	d	12
7/14	10:30 A.M.	Air Water	26 26	No wind; clear	Smooth	d	9
7/15	10:45 A.M.	Air Water	25.5 26	No wind; clear	Smooth	d	10
7/16	10:45 A.M.	Air Water	28 26	Breeze; clear	Ripply	a	9
7/17	10:45 A.M.	Air Water	30.5 26	Breeze; clear	Ripply	a	10
7/18	2:00 P.M.	Air Water	32 26.5	Breeze; part cloudy	Ripply	a	13
7/19	11:50 A.M.	Air Water	29 27	Breeze; hazy	Ripply	a	9
7/20	10:00 A.M.	Air Water	26 26	Breeze; part cloudy	Ripply	a	9
7/21	10:45 A.M.	Air Water	27 26.5	No wind; part cloudy	Smooth	a	9
7/22	10:30 A.M.	Air Water	23 25	No wind; rain	Smooth	a	13
7/23	10:30 A.M.	Air Water	27 25	Breeze; rain	Ripply	a	9
7/24	10:30 A.M.	Air Water	26 25.5	Breeze; hazy	Ripply	a	9
7/25	11:30 A.M.	Air Water	24 25	Breeze; part cloudy	Ripply	a	9
7/26	12:30 P.M.	Air Water	26.5 26	Breeze; part cloudy	Ripply	d	9
7/27	10:40 A.M.	Air Water	24.5 25	Breeze; clear	Ripply	a	13
7/28	10:50 A.M.	Air Water	25 25.5	Breeze; hazy	Ripply	a	9
7/29	10:45 A.M.	Air Water	25 25.5	Breeze; hazy	Ripply	a	9
7/30	10:40 A.M.	Air Water	27.5 25.5	Breeze; hazy	Ripply	a	9
7/31	11:00 A.M.	Air Water	26.5 26.5	Breeze; hazy	Ripply	a	9
8/ 1	11:00 A.M.	Air Water	24.5 26	Breeze; part cloudy	Ripply	a	9
8/ 2	11:07 A.M.	Air Water	27.5 26	No wind; clear	Smooth	a	9
8/ 3	10:50 A.M.	Air Water	28.5 25.5	Breeze; hazy	Ripply	a	9
8/ 4	10:30 A.M.	Air Water	27 25.5	Breeze; part cloudy	Ripply	a	9

Table 9.—Hourly Collections, Station IIIa

Date 1913	Time of first collection	Temperature centigrade		Air conditions	Water conditions	Anchor or drift	Number of hauls
8/11	7:00 A.M.	Air Water	19.5 24	Breeze; hazy	Ripply	d	6
8/11	8:00 A.M.	Air Water	20.5 24.5	Breeze; hazy	Ripply	d	6
8/11	9:00 A.M.	Air Water	22.5 25	Light wind; hazy	Wavy	d	6
8/11	10:00 A.M.	Air Water	24 25.5	Light wind; hazy	Wavy	d	6
8/11	11:00 A.M.	Air Water	27 26	Light wind; hazy	Wavy	d	6
8/11	12:00 M.	Air Water	28 26.5	Light wind; hazy	Wavy	a	6
8/11	1:00 P.M.	Air Water	29.5 26	Wind; hazy	Choppy	a	6
8/11	2:00 P.M.	Air Water	29.5 26	Wind; hazy	Choppy	a	6
8/11	3:00 P.M.	Air Water	30 26	Wind; hazy	Choppy	a	6
8/11	4:00 P.M.	Air Water	29.5 26	High wind; hazy	Rough	a	6
8/11	5:00 P.M.	Air Water	26 25.5	High wind; hazy	Rough	a	6
8/11	5:48 P.M.	Air Water	25.5 25.5	High wind; hazy	Rough	a	6
8/11	6:40 P.M.	Air Water	20.5 25	High wind; hazy	Rough	a	6

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(Owing to lack of time the writer is unable to present an exhaustive bibliography. Only those references are named in the following list which were most constantly in use, all of them being in the writer's immediate possession. The writer also made frequent use of the extensive private library of Professor C. A. Kofoid, as well as the library of the University of California.)

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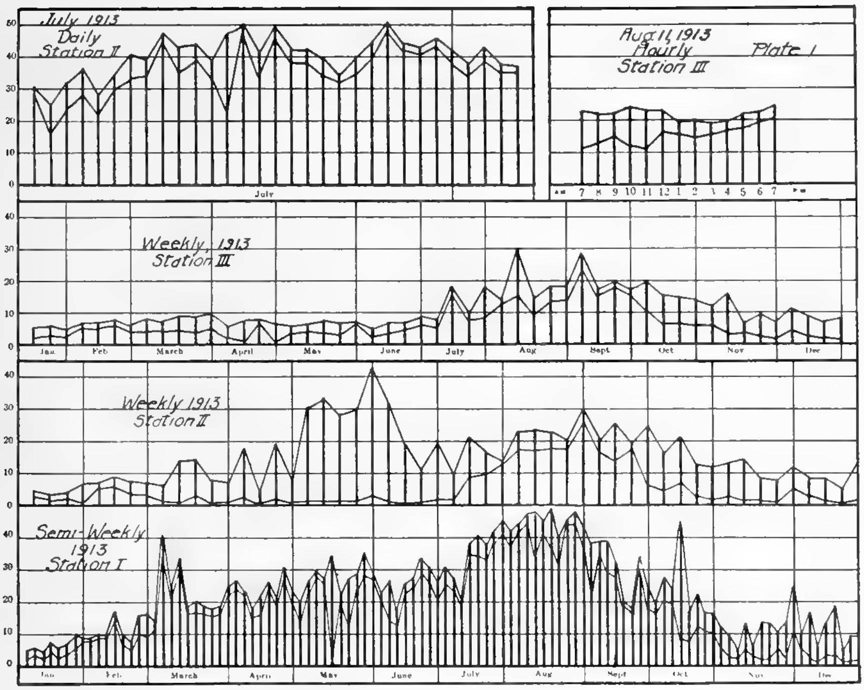
July 1913
Daily
Station II
July
Aug 11, 1913
Hourly
Station III
Plate 1
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 7 P.M.
Weekly, 1913
Station III
Jan Feb March April May June July Aug Sept Oct Nov Dec
Weekly 1913
Station II
Semi-Weekly
1913
Station I

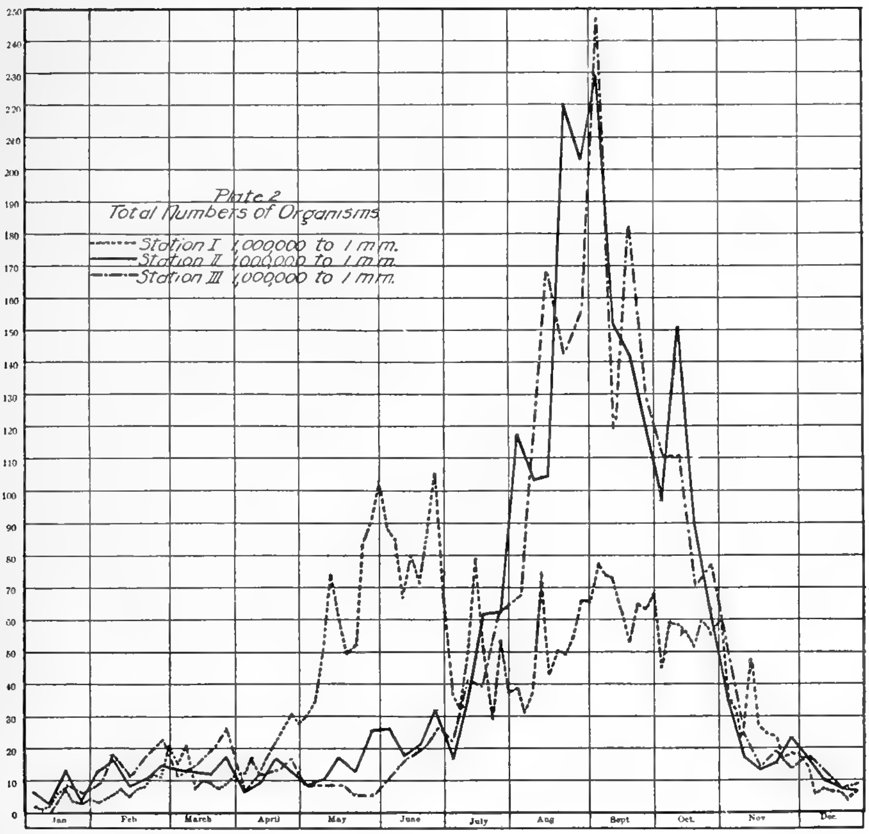
Plate 2
Total Numbers of Organisms
Station I 1,000,000 to 1 mm.
Station II 1,000,000 to 1 mm.
Station III 1,000,000 to 1 mm.
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
March
April
May
June
July
Aug
Sept
Oct.
Nov
Dec.

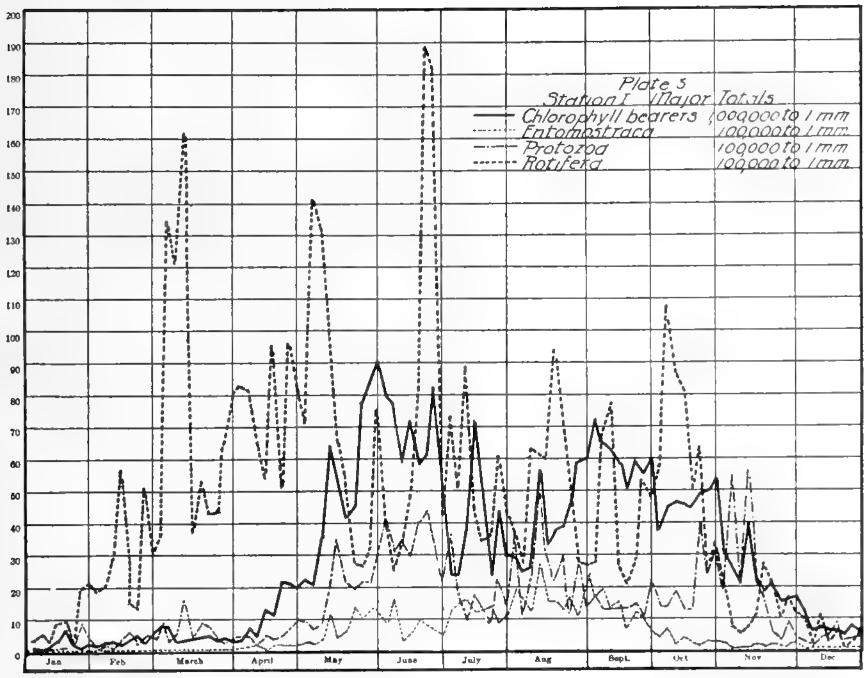
Plate 5
Station I Major Totals
Chlorophyll bearers 1,000,000 to 1 mm
Entomostraca 100,000 to 1 mm
Protozoa 100,000 to 1 mm
Rotifera 100,000 to 1 mm
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
March
April
May
June
July
Aug
Sept.
Oct
Nov
Dec

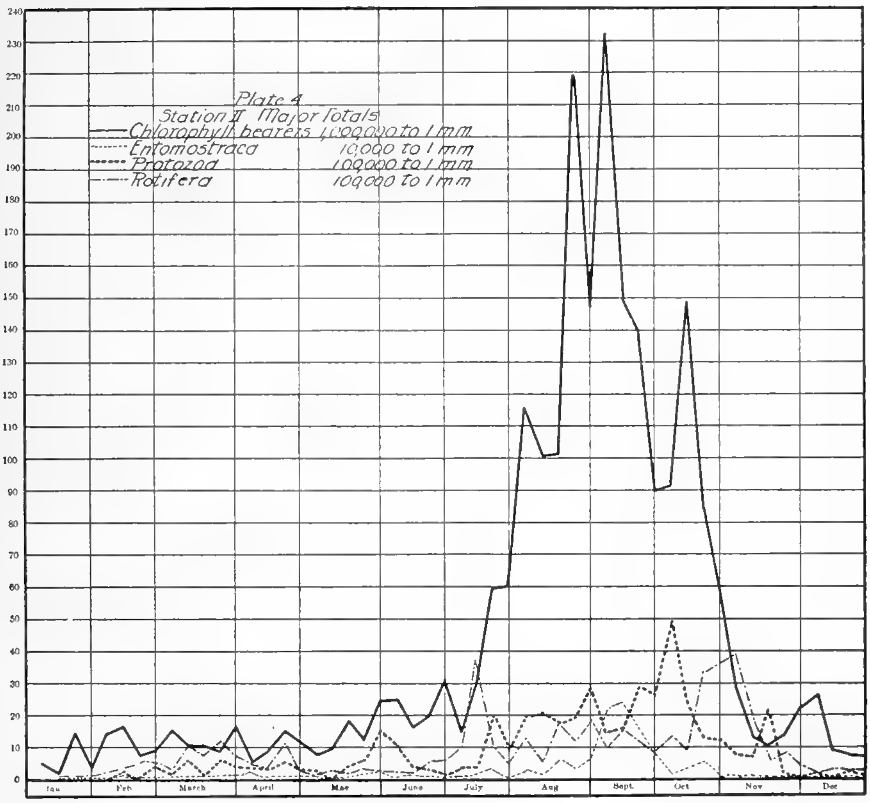
Plate 4
Station II Major Totals
Chlorophyll bearers 1,000,000 to 1 mm
Entomostraca 10,000 to 1 mm
Protozoa 100,000 to 1 mm
Rotifera 100,000 to 1 mm
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
March
April
May
June
July
Aug
Sept.
Oct
Nov
Dec

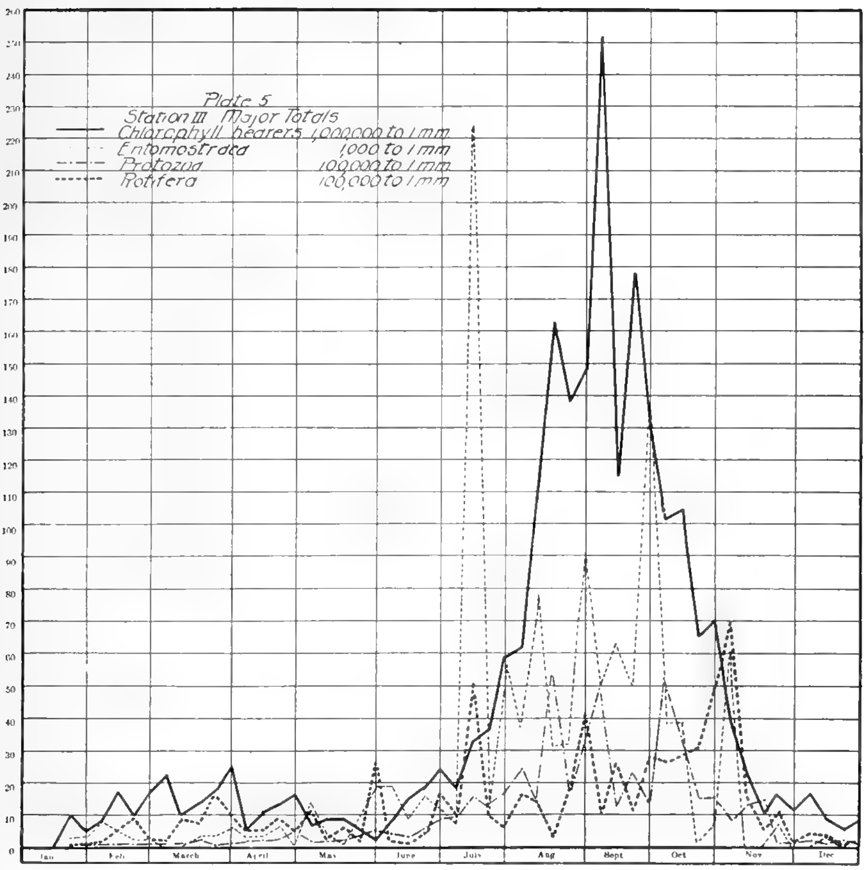
Plate 5
Station III Major Totals
Chlorophyll bearers 1,000,000 to 1 mm
Entomostraca 1,000 to 1 mm
Protozoa 100,000 to 1 mm
Rotifera 100,000 to 1 mm
260
240
230
220
210
200
190
180
170
150
140
130
120
110
100
90
80
70
50
40
30
20
10
0
Feb
March
April
June
July
Aug
Sept
Oct
Nov
Dec

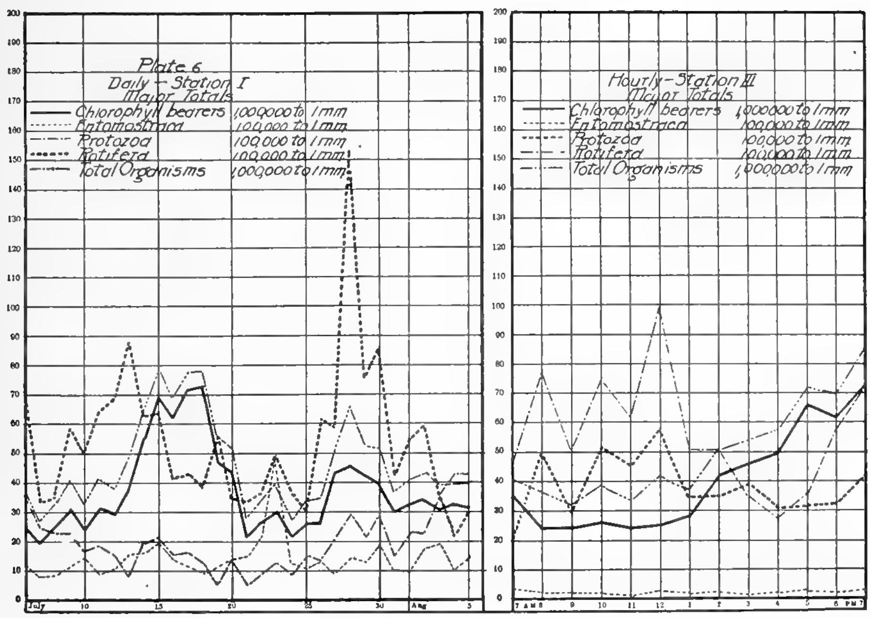
Plate 6
Daily — Station I
Major Totals
Chlorophyll bearers 1,000,000 to 1 mm
Entomostraca 100,000 to 1 mm
Protozoa 100,000 to 1 mm
Rotifera 100,000 to 1 mm
Total Organisms 1,000,000 to 1 mm
Hourly — Station III
Major Totals
Chlorophyll bearers 1,000,000 to 1 mm
Entomostraca 100,000 to 1 mm
Protozoa 100,000 to 1 mm
Rotifera 100,000 to 1 mm
Total Organisms 1,000,000 to 1 mm

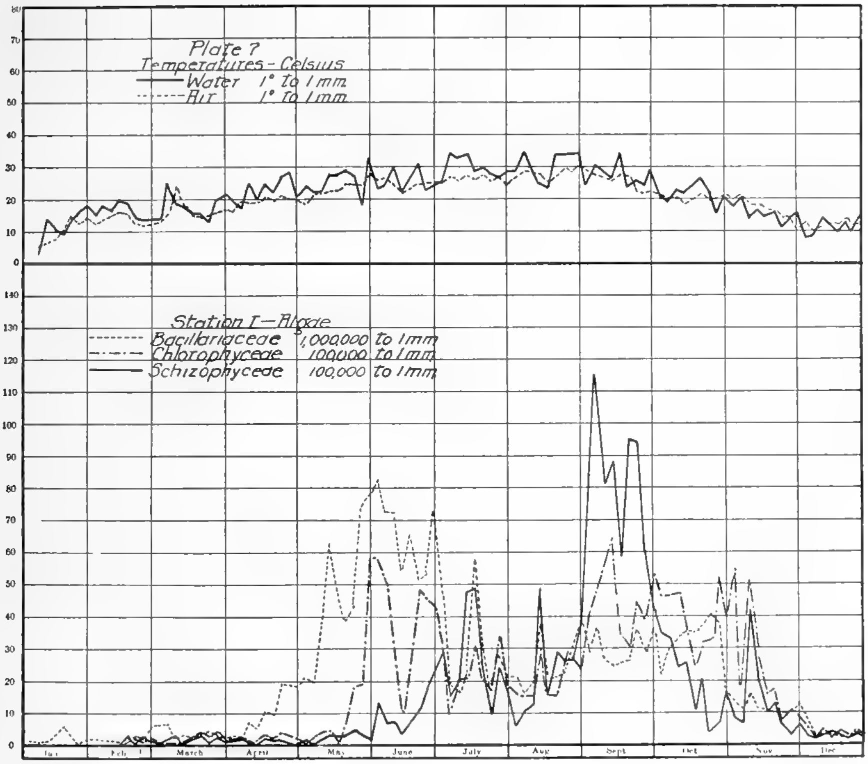
Plate 7
Temperatures - Celsius
Water 1° to 1 mm
Air 1° to 1 mm
Station I—Algae
Bacillariaceae 1,000,000 to 1 mm
Chlorophyceae 100,000 to 1 mm
Schizophyceae 100,000 to 1 mm
June
July
Aug
Sept
Oct
Nov
Dec

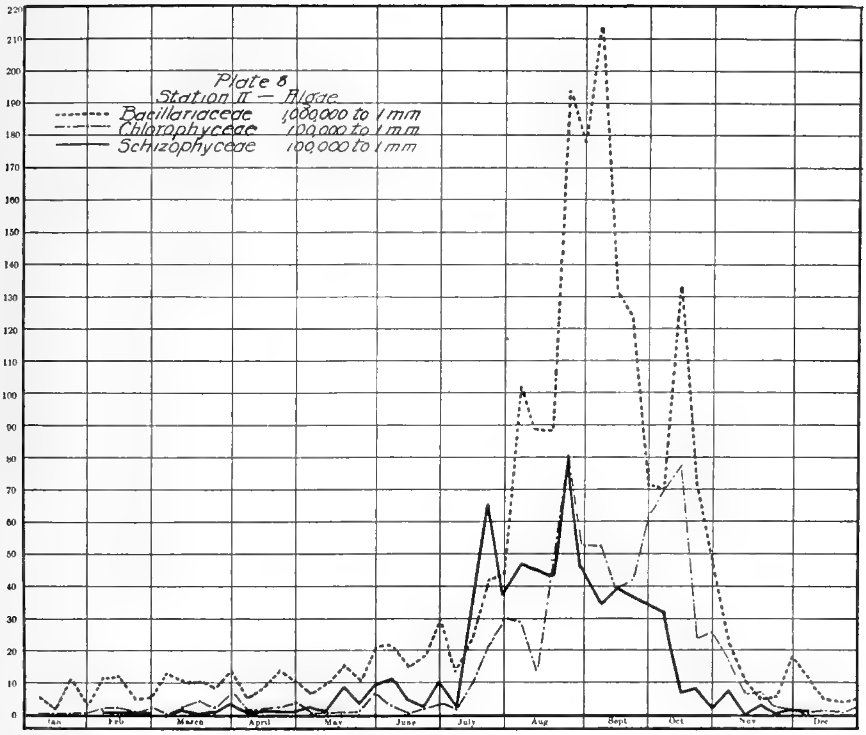
Plate 8
Station II — Algae
Bacillariaceae 1,000,000 to 1 mm
Chlorophyceae 100,000 to 1 mm
Schizophyceae 100,000 to 1 mm
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
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June
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Aug
Sept
Oct
Nov
Dec

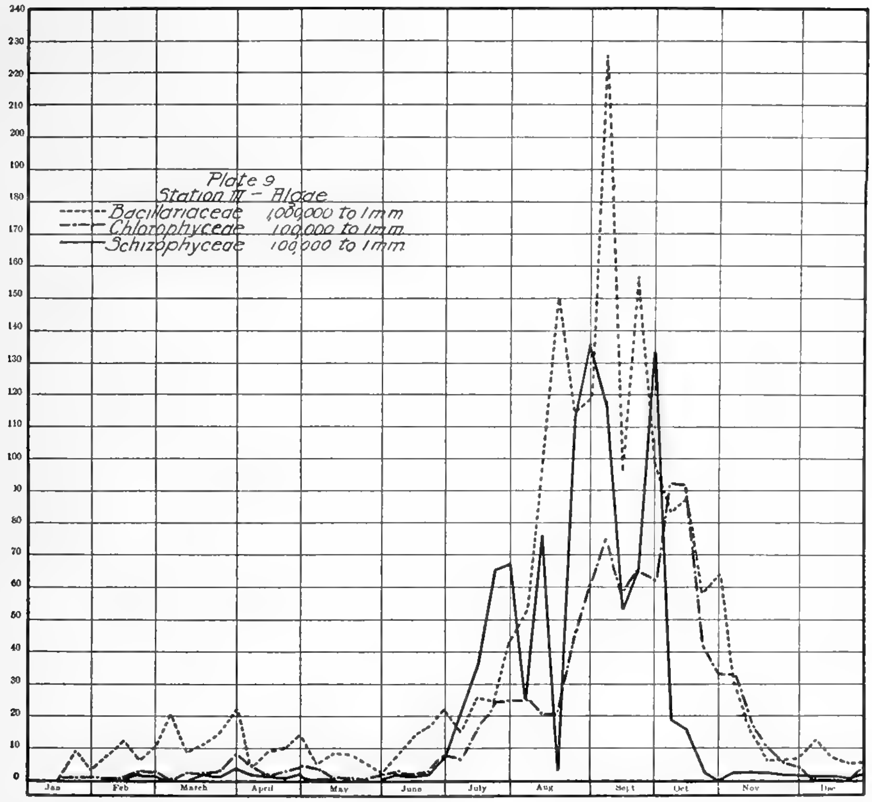
Plate 9
Station III – Algae
Bacillariaceae 1,000,000 to 1mm
Chlorophyceae 100,000 to 1mm
Schizophyceae 100,000 to 1mm
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
March
April
May
June
July
Aug
Sept
Oct
Nov
Dec

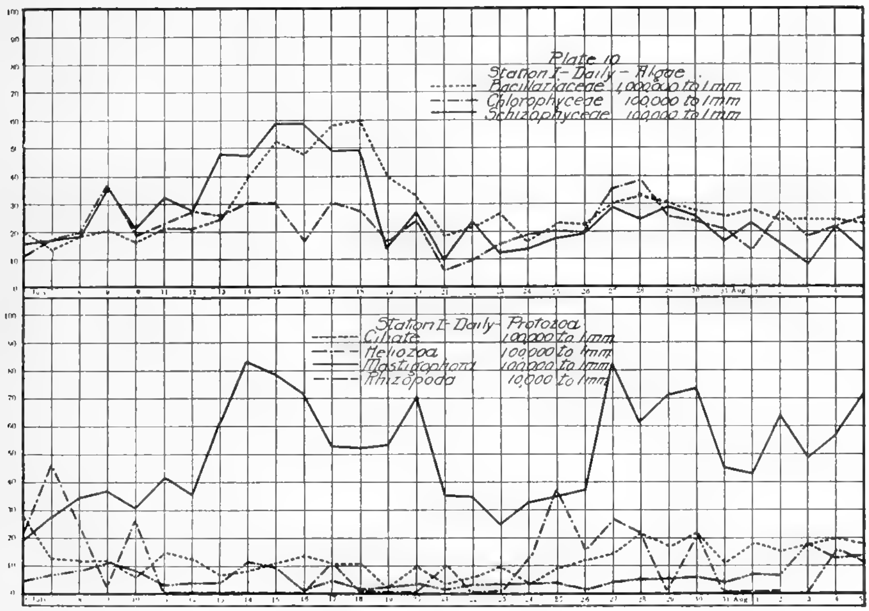
Plate 10
Station I - Daily - Algae
Bacillariaceae 1,000,000 to 1 mm
Chlorophyceae 100,000 to 1 mm
Schizophyceae 100,000 to 1 mm
Station I - Daily - Protozoa
Ciliate 100,000 to 1 mm
Heliozoa 100,000 to 1 mm
Mastigophora 100,000 to 1 mm
Rhizopoda 10,000 to 1 mm

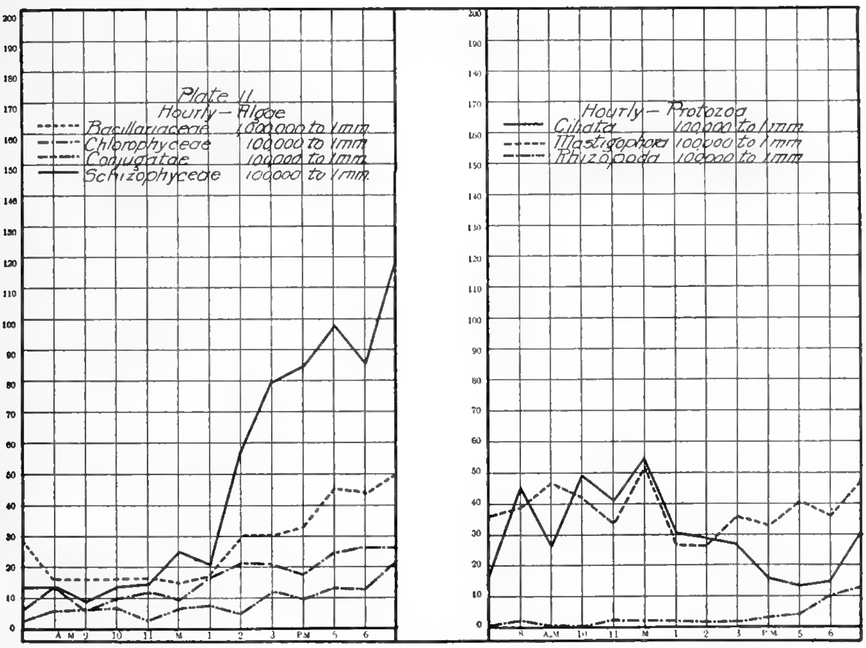
Plate 11.
Hourly—Algae
Bacillariaceae 1,000,000 to 1mm
Chlorophyceae 100000 to 1mm
Conjugatae 100000 to 1mm
Schizophyceae 100000 to 1mm.
A.M 9 10 11 M 1 2 3 P.M 5 6
Hourly—Protozoa
Ciliata 100000 to 1mm
Mastigophora 100000 to 1mm
Rhizopoda 100000 to 1mm
8 A.M 10 11 M 1 2 3 P.M 5 6

Station I Station II

Station III Station IV

San Joaquin Plankton Collecting Stations