NOTES ON LAKE TAHOE, ITS TROUT AND TROUT-FISHING.

By CHANCEY JUDAY,
Wisconsin Geological and Natural History Survey.

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INTRODUCTION.

Lake Tahoe is one of the largest as well as one of the most picturesque American mountain lakes. From a scientific standpoint, it is also a most interesting body of water, but the study of it has been very much neglected, and comparatively little is known of its physical and biological aspects. Muir has given some delightful sketches of the beauties of the lake and the surrounding country. Le Conte spent a short time there in the fall of 1873, making some physical investigations, the results of which he published ten years later. In 1878 Gill and Jordan described some of the fishes of the lake. In 1889 the United States Geological Survey made a survey to determine the possibilities of the basin as a storage reservoir for irrigation purposes and has since published topographical maps of the region based on surveys made in 1889. Russell, in his "Lakes of North America," has given a brief but excellent description of Lake Tahoe. In 1902 Price issued an admirable little "Guide to the Lake Tahoe Region," in which the more important physical and biological features of the region are pointed out and briefly described. Early in 1904 Treat described the angling methods employed by the fishermen as well as some of his own experiences on the lake as an angler. Ward has recently published a report on some investigations which he made in this region during the summer of 1903. Such, in brief, is the accessible literature pertaining to the physical and biological features of Lake Tahoe and vicinity. (See p. 146 for references in full.)

During the summer of 1904, this interesting region was visited by the writer in order to make some investigations for the United States Bureau of Fisheries. The investigations were limited to Lake Tahoe, with the exception of a day spent in making a cursory examination of some of the small lakes lying to the southward, in the vicinity of Glen Alpine. They covered but a brief period of time, June 17 to July 6. Their chief object was to obtain as much information as possible concerning the methods employed by the fishermen in catching the trout, and the amount and value of the catch.[a]

[a] I am indebted to Wells Fargo & Co., and Mr. S. D. Brastow, superintendent of their western division; to Mr. Charles A. Vogelsang, chief deputy of the California fish commission; to Mr. E. W. Hunt, in charge of the two state hatcheries located on the lake; to Mr. William Boyle and to Prof. W. W. Price; likewise to various residents of the region, fishermen, and others, for information, assistance, and numerous courtesies.

DESCRIPTION OF LAKE TAHOE.

Location, size, and physical features.—Lake Tahoe is situated in eastern California and western Nevada. The boundary line between these two states passes through it in a north and south direction, only a short distance west of the eastern shore, so that more than two-thirds of the area of the lake lies in California and less than one-third in Nevada. The thirty-ninth parallel of latitude crosses the southern end. To quote from Le Conte (1883, p. 506):

> This lake, the largest and most remarkable of the mountain lakes of the Sierra Nevada, occupies an elevated valley at a point where this mountain system divides into two ranges. It is, as it were, ingulfed between two lofty ridges, one lying to the east and the other to the west. As the crest of the principal range of the Sierra runs near the western margin of this lake, this valley is thrown on the eastern slope of this great mountain system.

The greatest dimension of the lake is in a north-south direction, and is said to be about 22.5 miles; its greatest width is about 13 miles, and it has an area of about 195 square miles. The tributary watershed has an area of more than 300 square miles exclusive of the area of the lake, the whole basin having an area of a little more than 500 square miles. The altitude of the lake is 6,225 feet and the greatest depth found by Le Conte was 1,645 feet (501 meters).

Affluents.—Le Conte further says:

> Probably more than a hundred affluents of various capacities, deriving their waters from the amphitheater of snow-clad mountains which rise on all sides from 3,000 to 4,000 feet above its surface, contribute their quota to supply the lake. The largest of these affluents is the upper Truckee River, which falls into its southern extremity. The only outlet to the lake is the Truckee River, which carries the surplus waters from a point on its northwestern shore out through a magnificent mountain gorge, thence northeast, through the plains of Nevada, into Pyramid Lake (and Winnemucca Lake). This river in its tortuous course runs a distance of over one hundred miles.

Generally a large amount of snow falls on the lakeward slopes of the surrounding mountains and thus supplies many of these affluents with water during the entire summer. Muir (1878) states that observations were made at a station on the west shore of the lake and it was found that the amount of snow, measured as it fell, was a little less than 10 feet one winter and over 47 feet another winter. On the 21st of June, 1904, vast areas were found along the upper courses of some of the affluents where the snow was from 5 feet to probably 30 feet deep. The warm summer's sun was melting this snow rapidly and by midafternoon these streams had increased enormously in size.

Variations of level.—On this subject Le Conte says (1884, p. 41):

> As might be expected, the waters of Lake Tahoe are subject to fluctuations of level, depending upon the variable supplies furnished by its numerous affluents. In midwinter, when these streams are bound in icy fetters, the level falls; while in the months of May and June, when the snows of the amphitheater of mountain slopes are melting most rapidly, the level of the lake rises and a maximum amount of water escapes through its outlet. According to the observations of Capt. John McKinney, made at his residence on the western shore of the lake, the average seasonal fluctuation of level is about 0.61 meter (2 feet); but in extreme seasons it sometimes amounts to 1.37 meters (4.5 feet).

As a dam several feet in height is now maintained at the outlet, the fluctuations at present may be greater than those recorded above. According to Mr. Murphy, who has lived many years on the shores of the lake, the water was about 3 feet higher

than usual in June, 1904, and was the highest since 1861. Powell records a fluctuation of 5.5 feet (1891, p. 171).

Origin of the lake.—In discussing the origin of Lake Tahoe, Le Conte states that it is highly improbable that the basin was scooped out by glacial agencies; that, rather, the lake was once wholly occupied by ice, a huge mer de glace. He is inclined to the belief (1884, p. 45) that—

> * * * the small lakes near the southern and southwestern margin of Lake Tahoe are really glacier-scooped rock basins, yet the position of the principal lake, countersunk between two ridges of the Sierra Nevada, seems to render it probable that its basin may, in reality, be a "plication-hollow" or a trough produced by the formation of two parallel mountain ridges and afterwards modified by glacial agency—that it is, in fact, a feature of mountain formation and not of glacial sculpture.

Temperature.—No attempt was made to obtain the temperature of the water at any considerable depth; that is, beyond a depth of 425 feet. The following table shows the results obtained by Le Conte (1883, p. 509) and those obtained in this investigation:

Depth.	Temperature.		Depth.	Temperature.	
	Aug., 1873.	June, 1904.		Aug., 1873.	June, 1904.
Feet.	° *F.*	° *F.*	*Feet.*	° *F.*	° *F.*
0	67	60.75	300	46	41.25
25	.....	57	330	45.5 B	.....
50	63	55.25	400	45	40.8
75	.....	54.75	425	.....	40.8 B
100	55	49.75	480	44.5 B	.....
125	.....	46	500	44	.....
150	50	.....	600	43	.....
200	48	41.75	772	41 B	.....
250	47	.....	1,506	39.2 B	.....

The letter B indicates bottom temperatures. Le Conte states that he obtained the same general results in all parts of the lake and that his table is an abstract of his average results. It will be noted that he obtained higher temperatures than those obtained by me. This may be accounted for chiefly by the fact that his observations were made between the 11th and 18th of August, or about the time the water had reached its maximum temperature for the summer, while mine were made on June 27, or before the water of the lake had been exposed very long to the warming influence of the summer's sun. The temperature of the water in three of the creeks was as follows: Blackwood Creek, 50° F.; McKinney Creek, 46.5°; Taylor Creek, 55.75°.

There are some thermal springs at the northern end of the lake, one of which, at Brockway, had a temperature of 130° F. The temperature of this water as it came from the ground was probably somewhat higher, for this reading was made in a large basin about 5 feet in diameter and several feet deep, and the warm water entered the bottom of the basin. This thermal spring is one of the attractive features of the resort, as its water is palatable and is also utilized for bathing purposes. Le Conte records a temperature of 131° F. for some of these thermal springs.

The temperature of the air probably remains several degrees below the freezing point for a considerable period of time each winter, yet ice never forms on the lake except in shallow, detached bays. "The true explanation of the phenomenon may,

doubtless, be found in the high specific heat of water, the great depth of the lake, and in the agitation of its waters by the strong winds of winter." (Le Conte, 1883, p. 511.)

Transparency.—Lake Tahoe is noted for its clear, transparent water. On calm, sunny days, objects could be distinctly seen on the bottom where the water was 50 feet deep. In fact, these objects were so plainly visible that the water did not appear to have a depth of more than 10 or 15 feet. A Secchi's disk, 5 inches in diameter, just disappeared from view at a depth of 65 feet. Le Conte (1883, p. 512) found the water much more transparent, however, as he says that a dinner plate 9.5 inches in diameter was plainly visible at a depth of 108 feet. The lower degree of transparency found by me was probably due to the fact that my observations were made during the flood season. All the affluents were filled to overflowing and had been for some time previous to this. These swollen streams were invariably more or less roily, and at the mouths of the larger ones the sediment-bearing water could be traced into the lake for some distance.

One of the most striking features of the lake is the great diversity of color exhibited by the water. "It appears that under various conditions—such as depth, purity, state of sky, and color of the bottom—the waters of this lake manifest nearly all the chromatic tints presented in the solar spectrum between greenish yellow and the darkest ultramarine blue, bordering upon blue black." (Le Conte, 1883, p. 596).

Aquatic vegetation.—The larger forms of aquatic plants were found to be comparatively scarce. Most of the shore of the lake is of such a nature that it is difficult for them to obtain a foothold. In the more favorable locations such forms as *Scirpus*, *Batrachium*, *Potamogeton*, *Carex*, and *Nitella* were found.

The plankton.—A few plankton hauls were made June 27, 1904, on the west side of the lake, about 2 miles south of Tahoe Tavern, where the water reaches a depth of about 400 feet. A comparatively small quantity of plankton was found; the lake would probably be classed as plankton-poor. The phytoplankton was relatively small in amount and consisted of diatoms and filamentous algæ.

Only one species of rotifer was noted, *Notholca longispina* Kellicott. It was found in very limited numbers.

Copepoda made up at least three-quarters of the bulk of the plankton. The limnetic members of this group were *Epischura nevadensis* Lilljeborg and a species of *Diaptomus*. The latter was the most abundant form and constituted over half the entire quantity of plankton. *Cyclops* was not noted in any of the limnetic catches.

The Cladocera were represented in the limnetic region by two Daphnias. *Daphnia pulex* De Geer apparently belongs to the variety *pulicaria* Forbes. It differs from Forbes's description of this variety in a few minor points, the sensory hairs projecting slightly beyond the tip of the beak, and the eye being somewhat smaller and situated a short distance above the ventral margin of the head. *Daphnia hyalina* Leydig seems to agree most closely with Burckhardt's variety *richardi*. The head is small, contained four times in the length of the body, and its ventral contour is moderately concave. The crest is small and regularly curved. The eye is small and situated in the anterior third of the head, a short distance above the ventral margin. The spine is short.

In the littoral region, the following Cladocera were found: *Ilyocryptus acutifrons* Sars, *Eurycercus lamellatus* O. F. Müller, *Acroperus harpæ* Baird, *Alona affinis* Leydig, *Chydorus sphæricus* O. F. Müller.

Epischura and *Diaptomus* deserted the upper 5 feet of water on bright, sunny days, but both came to the surface at night. The latter was very abundant at the surface at night. *Daphnia hyalina* descended to a depth of 40 feet during the daytime, but came to the surface at night. *Daphnia pulex* descended to a depth of 50 feet in the daytime, but was found at the surface at night. The two *Daphnia* were found this near the surface in the daytime only in the shallower water, where the transparency was only about 52 feet. In the deeper water, where the transparency was greater by 13 feet, neither form was found in catches that did not reach a depth of 75 feet. Thus the diurnal migration of *D. hyalina* was at least 40 feet in the shallower, less transparent water and about 75 feet in the deeper, more transparent water, while *D. pulex* showed a daily migration of 50 to 75 feet. These migrations were greater than any noted for these forms in Wisconsin lakes or in Winona Lake, Indiana. In these instances the maximum movement of *D. hyalina* was only 22 feet and of *D. pulex* a little less than 40 feet (Juday, 1903 and 1904).

THE TROUT OF LAKE TAHOE.

Species, size, abundance, etc.—Only two kinds of trout are caught in any considerable numbers. These are *Salmo henshawi* (Gill & Jordan), which has several common names, such as Lake Tahoe trout, Truckee trout, pogy, and snipe; and also *Salmo tahoensis* (Jordan & Evermann), which is commonly called the silver trout of Lake Tahoe. Locally, the males of the former are frequently called redfish because they have copper-colored sides during the breeding season.

The Tahoe trout, or pogy, is caught chiefly along the western side of the lake and at the south end. A large area extending south a few miles from Observatory Point seems to be a good feeding ground for them, and this is the favorite fishing ground of the anglers located in the vicinity of Tahoe City. Silver trout are most abundant in the northeastern part of lake, in Crystal Bay and Sand Harbor, but a few are caught in other parts. The Tahoe trout is caught in much greater abundance than the silver trout, but it does not attain such a large size. The former rarely exceeds a weight of six pounds, while specimens of the latter have been caught which exceeded this weight by several pounds. The following measurements and weights of trout caught in Lake Tahoe are given by Treat (1904, p. 866), who does not, however, indicate the species he measured and weighed:

Length.	Weight.
Inches.	*Pounds.*
17.25	1.75
19.75	2.6
20.75	3.75
25.75	5.5
29.75	9.5

Some years ago the Mackinaw trout, *Cristivomer namaycush* (Walbaum), was introduced, and examples of it are caught occasionally in the southern part of the lake. During the season of 1903, a 10-pound trout of this species was caught in the vicinity of Glenbrook.

Breeding habits.—The Tahoe trout, or pogy, ascends the streams to spawn and begins spawning, usually, about the middle of April. Mr. E. W. Hunt stated that the trout began spawning about two weeks later than usual in 1904, and that they averaged somewhat smaller in size than in former years. He also stated that the average number of eggs obtained from each female was about 1,400. As late as August a few trout may be found spawning in some of the streams, but generally the vast majority are through by the middle of June.

Some years ago the California Fish Commission established two good hatcheries on Lake Tahoe. Each hatchery has a capacity of about a million eggs, and almost every season both are filled to their utmost capacity with the eggs of the Tahoe trout. The fry developed from these eggs are planted in Lake Tahoe itself and in the small lakes tributary to it. Many of these small lakes did not possess trout until they were stocked by the commission. The fry are usually planted about the first week in August. The large increase in the catches of trout during the past two seasons is undoubtedly due to two factors, first the activity of the California Fish Commission in keeping the lake well stocked, and second, for the past four years the beginning of the open season on June 1 instead of May 1 as formerly, so that the trout are now protected during the most important part of their spawning season.

The silver trout spawns in the lake, hence its eggs can not be obtained for the hatcheries.

Food.—Owing to the fact that the fishermen kept their trout alive several hours after catching them, it was difficult to obtain good material for a study of the food. As a result, out of a dozen stomachs of Tahoe trout that were examined, only three were found to contain material of any consequence. The other nine contained only small quantities of insect fragments that were too small to identify. Two stomachs from trout that were 16 inches long were about one-fourth full. Each contained from 50 to 75 *Daphnia* and fragments of adult *Chironomus* and chironomid pupæ. The third stomach, from a male 15 inches long, contained 4.6 cubic centimeters of *Daphnia*, a small fragment of a beetle, and a few small fragments of other insects. The number of individuals making up the 4.6 cubic centimeters of *Daphnia* was estimated. Two separate measurements were made by allowing the material to settle for 24 hours in graduated cylinders. In one case, 1.1 cubic centimeters contained 430 *Daphnia*, and in the other, 1.3 cubic centimeters contained 477 individuals. The average for these two measurements is 378 individuals per cubic centimeter, which multiplied by 4.6 gives a total of 1,739 *Daphnia*. This, however, does not represent the total destruction of *Daphnia* for this single meal, as the brood chambers of a large number of them contained either eggs or embryos. About two-thirds of the individuals were *Daphnia pulex* and the rest were *D. hyalina*. It is an interesting fact also that no Copepoda were eaten, since both *Epischura* and *Diaptomus* were much more abundant than *Daphnia*. The former are much more powerful swimmers than the latter, but this fact alone is scarcely sufficient to account for their entire absence from the menu of the trout. A difference in size does not answer the question, for *Epischura nevadensis* is a large form and could be obtained as easily, apparently, so far as size is concerned, as *Daphnia*. The three trout that had eaten *Daphnia* must have obtained them at a depth of at least 40 feet, for these crustaceans were not found any nearer the surface than this in the daytime on the feeding ground where these fish were caught.

It was pointed out above that the fishermen find it necessary to use a longer line and thus, presumably, fish deeper as the season advances. Treat (1904, p. 868) has suggested that this is due to a downward movement of the plankton, the trout following it into the depths to feed on it. He gives no data, however, in support of his suggestion. Neither did my own observations extend over a sufficient period of time to determine whether the *Daphnia* do descend to greater depths in the daytime as the season advances. It is not at all unlikely that they do, for the water becomes warmer and it undoubtedly becomes more transparent, and both of these factors would tend to cause the descent to greater depths. But even if such a seasonal depth migration of *Daphnia* does occur, it would scarcely follow necessarily that the trout move down also because of this fact, for they are not entirely dependent on plankton crustacea for their food. In fact, the above records seem to indicate that these crustacea form only a minor part of the food in most cases, while insects form the major part at this season of the year. So it seems probable that other factors are involved, which can be determined only by observations covering a much longer period of time. Jordan and Henshaw (p. 198) state that the wonderful transparency of the water renders the use of a long line imperative, as the trout are too shy to be trolled in very near the boat. Thus the increase in the transparency of the water after the flood season of the streams is over may, in part, account for the increased length of line necessary for successful fishing late in the season.

The stomach of a 10-inch Tahoe trout which was caught in Fallen Leaf Lake, a small lake just south of Lake Tahoe, contained elytra of two beetles and fragments of 25 or 30 ants. Three Tahoe trout, each 7 inches long, were obtained from Grass Lake, a small lake still farther south, and their stomach contents were as follows: No. 1, 32 damsel-fly nymphs; No. 2, 6 damsel-fly nymphs, 4 water tigers (larval Dytiscidæ), and many chironomid larvæ; No. 3, 4 water tigers and many chironomid larvæ.

It is interesting to note in this connection that in these small lakes the Tahoe trout or pogy readily rises to the fly.

TROUT FISHING IN LAKE TAHOE.

Angling.—All of the fishing in Lake Tahoe is done by angling. Fishermen located at several points around the lake were visited and interviewed, and their methods and fishing gear were examined. The method which is almost universally employed at the present time differs but little from that described by Jordan and Henshaw in 1878 (p. 198), so that, to use Treat's appropriate expression, "it may fairly be said to have been born of experience" (1904, pp. 864–866).

Years of experience in trolling on Lake Tahoe have resulted in the adoption of the device now employed—a metal, egg-shaped spoon of generous dimensions, of burnished copper or nickel plated, according to the whim of the fisherman. Brass turnbuckles are attached to either end of this spoon. A snell and hook is fastened to the smaller end while a twisted copper wire 75 to 125 feet in length leads to the 20 feet of cotton line in the hand of the fisherman. The hook, a large-sized Pennel, Limerick, or Sproat for choice, is baited with worms or minnows. This gear is trolled from the rear of the boat, the line being continuously moved back and forth, the latter movement being made more quickly than the former so as to insure the proper spinning of the spoon. When the fish is hooked he is pulled in by main strength.

The hook is usually put about 3 feet from the large spoon and sometimes a small spinner is attached just above the hook. About the only change that is made in this gear is the substitution of a "squid" spoon for the regular one. This is a large oval spoon with a large hook attached directly to one end and with a swivel at the other end for attachment to the line. Some of the fishermen consider this spoon better for large trout than the regular one.

The wire line is made of 4 to 12 strands of fine copper wire, the number of strands depending on the size of the small wire used. For convenience in handling, the line is wound upon a hand reel, which usually has a drum 5 inches or more in diameter. Wire line is used in preference to any other, because it helps to sink the spoon, and the fishermen have learned from experience that the hook must be trolled at a considerable depth. The open season extends from June 1 to November 1. Early in June the fishermen use a line 50 to 75 feet long, but as the season advances more and more line must be used, so that by September or October a line 200 feet long is sometimes used.

Some years ago still-fishing was indulged in by amateurs, but this method is no longer employed.

Minnows are the standard bait, although many angleworms are used. When the trout are not readily tempted by these two kinds of bait, the fishermen resort to grubs, dobsons, and caddis-fly larvæ. Formerly, canned clams were frequently used in still-fishing.

Most of the trout are caught along the edge of deep water—that is, where the water rapidly descends from a depth of 50 or 60 feet to a depth of 200 feet or more. The best results are obtained by rowing the boat alternately from shallow to deep water and back again, in a zigzag course, along such a slope. Sometimes trout are caught where the water is only a few feet deep, but this is a rare occurrence. Occasionally, also, they will rise to a fly, but in general rod and fly fishing are not a success. Deep fishing with the regular "jerk" line yields much better results.

Shipments of trout.—It is impossible to say, of course, just how may pounds of trout are taken from Lake Tahoe in a season, for anglers are numerous and they are not particularly interested in keeping records of their catches. But a general idea of the results of the fishing done on the lake may be obtained from the following table, which shows the number of pounds of trout shipped from the lake during the past five seasons:

Season.	Trout shipped.
	Pounds
1900	58,667
1901	11,981
1902	7,982
1903	13,977
1904	22,780

The record for 1901 does not include the shipments from Tahoe City, as no data were received from this office concerning its shipments in that year. So far as these statistics go, 1900 was the banner season. This was followed by an unsually small shipment in 1901 and a still smaller one in 1902, the shipment of the latter year being only about one-seventh of that in 1900. There were marked improvements in 1903 and 1904, but even the shipment in 1904 reached scarcely more than a third of that in 1900.

The following table shows the shipments by months from a single express office, Tahoe City, during four seasons. As stated above, no record was obtained from this office for 1901.

Month.	1900.	1902.	1903.	1904.
May	3,672	.....	.....	.....
June	8,992	.....	2,951	6,181
July	8,490	.....	2,541	9,935
August	4,327	813	2,050	1,470
September	1,006	310	506	600
Total	26,487	1,123	8,048	18,186

During the three seasons, 1900, 1903, and 1904, the largest monthly shipments were made in June and July. In 1903 the largest monthly shipments from the express office at Tallac were made in the months of June and July and the same was also true of the shipments from McKinney's in 1900. About nine-tenths of the trout shipped are Tahoe trout, *Salmo henshawi*.

Mr. William Boyle informed the writer that the price of these trout has risen in the past twelve years from 10 cents a pound as a minimum to 35 cents per pound in 1903. During June of the past season, 1904, the fishermen received about 30 cents per pound. At the above prices the trout shipped in 1903 had a commercial value of $4,891.95, and in 1904, $6,819. Many of the trout that are shipped, however, are not placed on the market, for the successful tourist angler usually ships a large portion of his catch to relatives or friends. The trout shipped by the commercial fishermen are marketed chiefly in San Francisco, where they are retailed at 50 to 75 cents a pound. A small portion of each year's catch is marketed in Tahoe City, Cal., and Carson City, Nev.

The above figures, however, do not include two unknown but nevertheless very large elements of each season's catch, the trout used by the resort hotels and those consumed by campers and individuals who have summer homes around the lake. An attempt was made to obtain some idea of the amount consumed by the large hotels. The average daily consumption of each hotel during this investigation was obtained and on this basis an estimate was made for a season of ninety days. The sum total of these estimates approximates 10,000 pounds. This, added to the trout shipped from the lake in 1904, gives a total of 28,186 pounds. This sum accounts for only two parts of the season's catch. It is impossible to give an estimate of the third part, that is, the local consumption other than that of the hotels.

Some idea of the "luck" of the fishermen may be gained from the following record of two who were located at the outlet of the lake. This shows the number of trout caught by each on the days indicated.

Date.	Trout caught.	
June 29	7	2
June 30	12	14
July 1	14	12
July 2	12	5
July 3	8	.....
July 5	13	.....
July 6	14	.....

In weight, these trout averaged about 2 pounds. They were all Tahoe trout, *S. henshawi*. These fishermen usually started early in the morning, about sunrise, and returned about the middle of the afternoon. One catch was recorded, however, in which 11 trout were caught between 8 and 11.30 a. m.

Whitefish and suckers are abundant in the lake, but have no commercial value.

The regular flat-bottomed boat is used for fishing purposes, and each of these boats is provided with a tank or well in which the trout may be kept alive. These tanks will hold from 20 to 120 fish. About 80 of these fishing boats were found on the lake, and the average cost was about $30 each, so that the whole represented an investment of $2,400.

The importance of the Truckee River as a trout stream is suggested from the following record of shipments of trout from towns along its course during the season of 1900:

California.		Nevada.	
Locality.	Pounds.	Locality.	Pounds.
Truckee	24,978	Verdi	10,704
Boca	5,824	Reno	10,819
Floriston	4,374	Wadsworth	39,388

This gives a total shipment of 96,087 pounds for this one season.

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