METHOD AND RESULTS OF AN EFFORT TO COLLECT STATISTICS OF THE FISH TRADE AND CONSUMPTION OF FISH THROUGHOUT THE UNITED STATES.

BY CHAS. W. SMILEY.

In July, 1879, it was proposed by Gen. F. A. Walker, Superintendent of the Tenth Census, and Prof. Spencer F. Baird, Commissioner of Fish and Fisheries, to ascertain something of the extent and nature of the fish trade and consumption of fish throughout the entire United States. In consequence there was prepared a three-paged circular with blanks for answers, and containing eighteen brief but comprehensive questions, such as:

1. Do fish constitute an important article of diet in your town and in the adjacent country?

2. Where is the supply obtained?

3. Check on the following list the kinds commonly to be seen in the markets: (list given.)

4. What is the average retail price per pound?

5. What kinds of fish are taken from your ponds and streams? Check on the following list: (list given.)

8. Are salted and smoked fish sold?

9. What kinds? Check on the following list: (list given.)

11. Are oysters brought to your place? How are they brought—in shell, in tubs, in cans? What is the usual price?

16. Answer same questions for clams and lobsters.

18. Is fish guano in its various forms used by your farmers?

With this was sent to every postmaster in the United States a circular letter asking the assistance of himself or some one familiar with the facts, and accompanied by a circular from the Postmaster-General, instructing postmasters to furnish such information as could be given "without prejudice to the duties of their offices." An addressed return envelope accompanied each circular.

The result of this sending in general terms was as follows:

Forty-one thousand five hundred and seventeen postmasters were addressed, from whom inside of two hundred days 16,996 replies were received, or 41 per cent. At the expiration of two hundred days it was deemed best to send again, to those who had not answered, precisely the same matter as had been sent before. This was done with a very gratifying result. Twenty-four thousand five hundred and twenty-one postmasters were addressed from whom, inside of two hundred days, 13,233 replies were received. In the six hundred and eighty days that have since elapsed, but 155 more replies have arrived. This is much less

than one per cent. The net result of two sendings was to get 73 per cent. of the reports desired:

Sending.	Circulars sent out.	Returns within 200 days.	Per cent. of the sending returned.	Per cent. of desired reports received.
I	41,517	16,996	41	41
II	24,521	13,233	54	32
Total	66,038	30,229	.....	73

I should have preferred a third sending at the expiration of two hundred days from the second. I estimate that a third call on the remaining 11,133 offices might have produced about 6,000 more replies, and brought the per cent. of results up to 86 per cent. of what was desired.

I have taken two hundred days as the limit of returns. The number that arrive after that is very insignificant. But it will be valuable to know what results to expect earlier. Taking the total of 16,996 replies which came in the first two hundred days, the percentage which came in each of the ten twenty-day periods was as follows:

Twenty-day periods.	Number of returns.	Per cent. of all.	The days that had elapsed from the time of sending.	Per cent. of what was destined to come, which had arrived each twenty-day period.
First	9,680	57	20	57
Second	4,711	27	40	84
Third	1,313	8	60	92
Fourth	604	3½	80	95½
Fifth	314	2	100	97½
Sixth	165	1	120	98½
Seventh	72	½	140	99
Eighth	65	½	160	99½
Ninth	42	¼	180	99¾
Tenth	30	¼	200	100
	16,996	100	200	100

The return within one hundred days of 97½ per cent. of all that would arrive within two hundred days, shows that when subsequent calls are to be made one hundred days is a very good limit to fix at which to send again. The receipts under the second call were even more precipitate than the first, being augmented slightly by the driblets from the first call. It was as follows:

Twenty-day periods.	Number of returns.	Per cent. of all.	The days that had elapsed from the time of sending.	Per cent. of what was destined to come which had arrived at each twenty-day period.
First	7,862	59½	20	59½
Second	2,796	21	40	80½
Third	998	7½	60	88
Fourth	790	6	80	94
Fifth	338	3	100	97
Sixth	238	2	120	99
Seventh	112	1	140	100
Eighth	33	.....	160	.....
Ninth	11	.....	180	.....
Tenth	3	.....	200	.....

The case under consideration was a semi-official call upon all the States and Territories, and the effect of the call upon the different sections was very different. While the total yield of returns was 73 per cent. of the offices addressed, 95 per cent. of the Dakota offices answered, and but 61 per cent. of the Louisiana offices answered. The per cent. of answers for each State or Territory was as follows:

	Per cent.		Per cent.
Dakota	95	New Jersey	77
Indian Territory	89	Illinois	77
Washington	88	Ohio	76
Wyoming	88	Colorado	75
Idaho	87	New Mexico	73
Rhode Island	87	Missouri	72
Utah	86	Indiana	71
Massachusetts	85	North Carolina	70
Vermont	83	New York	70
Oregon	83	West Virginia	69
Michigan	82	Maryland	69
Kansas	81	Arizona	68
Maine	81	Arkansas	68
Nevada	81	Pennsylvania	67
New Hampshire	81	Delaware	66
Wisconsin	80	Tennessee	65
Connecticut	80	Kentucky	65
Minnesota	80	Georgia	65
Montana	80	Mississippi	64
Florida	79	South Carolina	63
California	78	Alabama	63
Iowa	78	Virginia	62
Nebraska	78	Louisiana	61
Texas	78		

It was to be expected that States would answer according to their degree of education and intelligence, and this is no doubt an element, but some other element has entered in here to place five Western Territories ahead of the best States. My own opinion is that the semi-official indorsement of the Postmaster-General had a far greater influence upon the new sections of the country than upon the older; that new officers answered partly because of the official indorsement, and that old ones have become somewhat accustomed to disregard such indorsements. But why Dakota exceeded Arizona 27 per cent., and the

Indian Territory exceeded New Mexico 16 per cent., I am unable to suggest, except the possibility of the loss of mails in transit, by fire, wrecking, robbing of mail coaches, etc.

A grouping of the geographical sections yields some interesting results:

New England.	Per cent.	Great Plain Region.	Per cent.	Pacific Coast.	Per cent.	The Northwest.	Per cent.
Rhode Island	87	Dakota	95	Washington	88	Michigan	82
Massachusetts	85	Indian Territory	89	Oregon	83	Kansas	81
Vermont	83	Wyoming	88	Nevada	81	Minnesota	80
Maine	81	Idaho	87	California	78	Wisconsin	80
New Hampshire	81	Utah	86			Iowa	78
Connecticut	80	Montana	80			Nebraska	78
		New Mexico	73			Illinois	77
		Arizona	68			Ohio	76
		Colorado	65			Indiana	71
Average	82	Average	82	Average	81	Average	78

Middle States.	Per cent.	The Southwest.	Per cent.	The Southeast.	Per cent.
New Jersey	77	Texas	78	Florida	70
New York	70	Missouri	72	North Carolina	70
Pennsylvania	67	Arkansas	68	Maryland	69
Delaware	66	Kentucky	65	West Virginia	69
		Tennessee	65	Georgia	65
		Mississippi	64	South Carolina	63
		Alabama	63	Virginia	62
		Louisiana	61		
Average	69	Average	68	Average	67

RECAPITULATION.

	Offices addressed.	Answers received in 60 days.	Per cent. which answered.
New England	3,176	2,616	82
Great Plain Region	1,381	1,137	82
Pacific Coast	1,528	1,236	81
The Northwest	13,157	10,239	78
Middle States	7,074	4,905	69
The Southwest	8,622	5,865	68
The Southeast	6,579	4,386	67
Total	41,517	30,384	73

For quantity, these results were entirely satisfactory. The quality of the replies was of all grades. A very large per cent., however, bore internal evidence of truthfulness. A wise discretion was needed in the compilation, but with skilled compilers excellent results could be produced. A discussion of methods of compilation, eliminating errors, etc., would be interesting, but cannot be included in this paper.

Let it not be supposed that these excellent results can be obtained only by government machinery. The official nature of this correspond-

ence was a great aid, but I have obtained even better results from college men upon matters relating to their colleges and from specialists concerning their specialties. I therefore feel free to protest against the careless and inefficient work of this sort so often done by both public and private enterprise. Patience and perseverance in wise methods may not be all the qualifications that are necessary for good statistical work, but these are indispensable. Some of the suggestions to be made for success in collecting material are the following:

I. Make the questions very clear, concise, and as few as possible. (Better send twice than totally break down by too long requests.)

II. If but one class of persons can be addressed from each of whom an answer is especially desirable, send to all a first issue, to all who do not answer in 100 days a second issue, and to all who do not answer in 100 days more a third issue.

III. If more than one class of persons can give the facts, address all of each class, and after about seventy-five days address the delinquents a second time.

IV. Do not vary the matter sent the second time. Let it be an exact duplicate, and be sent just exactly as if it had not been previously issued.

V. Leave blank lines between the questions, so that no other paper is needed for reply, and if it can be put on a postal furnish it, more for the sake of uniformity even than for inducing people to reply.

VI. Always inclose an addressed envelope or postal for reply, and provide that there be no expense to the respondent for postage.

VII. Remember that more or less of your circulars will be misdirected, lost in transit, fall into wrong hands, arrive during the absence or sickness of your correspondents, be crowded aside for later answer, or to get some needed information, and then inadvertently overlooked, and so, do not loose faith in human nature, but rather rejoice that amid so many contingencies you can get the material at all.

Statistics are frequently laughed at, usually pushed aside as "dry" and sometimes analyzed to the serious discomfort of the author. At other times they are extolled and made the basis of the most important action. I am quite sure that these various treatments are usually just. Accurate and truthful statistics are very scarce, and, when found, very valuable. Figures often do misrepresent terribly, notwithstanding the charitable maxim that "figures never tell lies."

Whoever has prepared statistics or tested them knows that the great and fruitful cause of bad statistics is in bad methods of collecting the data. The methods are not revealed on the face of the results, and hence the insidiousness of this cause. Mailing circulars does not constitute the most effective method, but if rightly managed it is cheapest. It is especially economical in government bureaus where postage costs nothing. The most effective method is by personal visitation of skilled agents. This, from its expense, is usually out of reach of private insti-

tutions, and often out of reach of government officers. The method of personal visitation I could extol very highly from personal experience and from close examination of results of that kind of work performed by others, but the present purpose has been to treat solely of the collection of material by mail.

U. S. FISH COMMISSION,
Washington, D. C., December 10, 1882.

NOTES ON THE MENHADEN FISHERY.

By OSCAR O. FRIEDLAENDER.

[Letter to Prof. S. F. Baird.]

Very large bodies of menhaden appeared on the Long Island coast between Fire Island and Rockaway Inlet last week, and all the boats did well. They were evidently driven in by sharks, as all the steamers caught lots of them. On Wednesday our steamer, the Leonard Brightman, caught 11 sharks, none less than 8 feet long, among 180,000 menhaden. We must have had last week not less than 350 sharks at the works. The destruction of these ferocious fish by the menhaden fleet during the season must be between 20,000 and 50,000, which should not be lost sight of. Steamers fishing between Barnegat and Harrifurt report fish all along the coast. I shall be pleased to furnish you a full report of catches at the close of the season.

My theory that the menhaden leave one locality for another to find better feeding ground seems now generally adopted. Between Cape May and Harrifurt, where the largest bodies of fat fish are found, they remain in spite of great numbers of steamers going there regularly to load up. Captain Church's steamers, especially the Humphrey, had a regular harvest there, loading up twice a week for three or four weeks past. If you determine to issue a circular regarding the seines, it strikes me that you may include not to commence fishing before May 15. Some opponents of the menhaden interest seem to believe that the spawning season commences about April 1 and extends to June. I differ with these gentlemen on that score on account of the poor quality of the menhaden caught early in May, but to satisfy these gentlemen and not to hurt our interests too much I do not doubt but all northern factories would submit to a recommendation from you not to open before May 15.

36 BROADWAY, NEW YORK, *September* 11, 1882.