THE UNIVERSITY OF MICHIGAN
DEPARTMENT OF BOTANY
ANN ARBOR, MICHIGAN 48104

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764-1440

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Mr. William P. Harris, Jr.
855 Ellair Place
Grosse Point Park
Michigan 48230

Dear Mr. Harris:

I'm sorry it has taken so long to complete a report of the mercury levels in the samples we took on our recent trip to the Huron Mountain Club. My research assistant, Mr. Stephen Bach, was unable to devote his full time to the analysis so the lab work took much longer to complete than previously.

Before I get into the results of the last trip I would like to thank you and all of the directors of the Foundation for the kind hospitality extended to us during our stay at Ives Lake. All of the personnel were exceedingly helpful and we were able to take all of the samples that we wanted to meet our analysis goals. My family accompanied me on this trip and they were thoroughly impressed with the natural beauty of the area. We very much enjoyed meeting Mr. McGraw and his wife.

I hope to use the data from our two trips to the area as justification for a grant application to the Atomic Energy Commission or a similar agency for a continued study of the mercury problem and I will be in contact with you in the future for permission to use the facilities for further study if the grant is awarded.

The data we obtained from the samples is included in an attached table. As you can see the results essentially confirm the measurements we obtained from the earlier samples. In all cases the mercury levels from the bottom sediments and the plankton were below 40 parts per billion (PPB) which approaches the limits of sensitivity for the technique we were using to measure mercury--neutron activation analysis. This is quite in agreement with the mercury levels we found in Frains Lake - a small lake near Ann Arbor which was also included in our study.

The average mercury content of the brook trout taken from Trout Lake was .185 parts per million (PPM). This is well below the present FDA standard for fish suitable for human consumption. The small mouth bass from Ann Lake averaged .376 PPM mercury -- also below the FDA standard, however the rock bass sample yielded a measurement of 1.16 PPM mercury, slightly over twice the FDA limit. The samples from Canon Lake yielded the most interesting results: the average measurement of the various brown trout samples was about .95 PPM -- almost twice the FDA limits, but the saveral dace we took from Canon Lake on our second trip averaged 2.01 PPM, with one fish (being small the whole ~~first~~ fish was analized) yielded nearly 4 PPM. The data from the fish from Frains Lake is included in the table for your perusal as well.

As I interpret this data I find I must conclude that the present FDA limit of mercury concentration in fish of 0.5 PPM may have been set hastily and with too little attention paid to mercury levels present in lakes that have not been subject to industrial, agricultural, or domestic mercury contamination. In plain terms I feel that natural or background mercury levels in fish may be at or above the present FDA standards and these standards are unnecessarily low. While the results of my study clearly indicate the need for further study of back round mercury levels, in undisturbed areas I personally conclude that the fish taken from the three lakes I sampled on the Foundation grounds would not be dangerous to consume.

I understand that some work that Dr. Margaret Davis carried out in Canon Lake indicates that there are some peculiar limnological features about that lake -- specifically a deep layer of water that is oxygen free (anaerobic) and this may explain why mercury levels are slightly higher in the fish from this lake. What little work that has been done on the matter indicates that the bacteria that can turn the relatively harmless forms of mercury, into the chemical form (methyl mercury) that is most readily concentrated in living tissue thrive best under these (anaerobic) conditions. I hope to contact Dr. Davis soon and go over the limnological data with her soon. If this is the case, Canon Lake would be an excellent site for future research.

I hope to be publishing this data soon and I will certainly send you copies of my paper for your library. The assistance of the Foundation will be gratefully acknowledged, I can assure you.

If, at a future date, you would like me to meet with your board of directors and/or members to explain my research hypothesis, techniques, and results in greater detail, I would be most happy to do so.

Again, many thanks for your kind assistance and the superlative support that I received from your representatives during my two trips to the Foundation lands.

Best regards,

Gordon E. McBride

Gordon McBride
Assistant Professor of Botany

CC: J. H. Campbell
GM/ss

TABLE 1

SITE	SAMPLE	MERCURY PPM	MERCURY PPB
Canon Lake	bottom sample	<.04	<40
	plankton	---	<40
	" "	---	58
	" "	---	37
	" "	---	36
	dace (whole)	.22	--
	"	3.80	--
	brown trout flesh	.83	--
	" " " " " "	.49	--
	" " " " " "	1.34	--
	" " " " liver	.78	--
	" " " " " "	.47	--
	" " " " " "	1.50	--
	" " " " brain	1.23	--
Ann Lake	bottom	---	11
	plankton	---	40
	" "	---	32
	Nitella (lg. Algae)	---	63
	rock bass flesh	1.16	--
	small mouth bass	---	--
	" " " " flesh	.475	--
	" " " " liver	.352	--
	" " " " brain	.303	--
Trout Lake	bottom	---	38
	" "	---	13
	plankton	---	31
		---	25
	brook trout flesh	.19	--
	" " " " " "	.28	--
	" " " " " "	.13	--
	" " " " brain	.076	--
	" " " " liver	.18	--
Frains Lake (near Ann Arbor)	bottom	---	<40
	plankton	---	<40
	perch flesh	.08	--
	sucker flesh	.05	--
	pickeral flesh	.56	--
	catfish flesh	.03	--
	crappie flesh	.03	--
	golden shiner flesh	.23	--
	bluegill flesh	.06	--
	small bass flesh	.19	--
	green sunfish flesh	.07	--