RELATION BETWEEN THE TEMPERATURE AND THE *p*H VALUE OF THE BOTTOM DEPOSITS FROM POND TAKASUKANUMA.

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Received August 13th, 1934. Published October 28th, 1934.

Knowledge of the relation between the temperature and the *p*H value of lake deposits is important to biological and biochemical studies of them. If a sample of deposits manifests different *p*H values at different temperatures, such will natu ally have different *p*H values also in the bottom of the lake as the temperature varies along with the seasons. Such a variation of *p*H may, on one hand, have seasonal influence on the benthoic fauna and flora, and, on the other, it may affect the chemical changes taking place in the bottom.

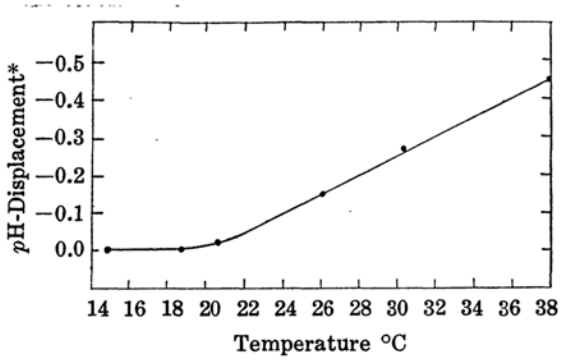
Now, the measurement of the *p*H value of bottom deposits is practically made in the laboratory instead of on the spot. Then, it happens very often that the temperature of the laboratory differs from that of the spot, and the observed values must be corrected in order to obtain the real values.

When the author made the investigation of the annual variation of the *p*H value in the deposits of Pond Takasukanuma in the course of the years

1932 to 1933, in parallel with studies on other factors affecting deposit metabolism,[1] it was necessary to establish the relation between the temperature and the *p*H value.

Displacements of the *p*H value between two temperatures were measured in five experiments. The results are shown in the table, by aid of which a curve of temperature-*p*H-displacement was drawn. This curve serves to compute the *p*H value of the actual place from that observed in the laboratory. Thus, on the 9th of August, 1933, the temperature was read 31.0°C. in laboratory and 14.9°C. in the bottom of the lake, and the observed value *p*H 6.46 is reduced to 6.73 by correction of +0.27.

	Temp. °C.	*p*H	*p*H-displacement
I	15.4 19.8	6.68 6.67	0.01
II	14.8 20.7	6.16 6.14	0.02
III	18.8 26.0	6.48 6.33	0.15
IV	18.8 30.5	6.52 6.26	0.26
V	19.1 38.0	6.83 6.38	0.45



* Referring to the *p*H value of the horizontal part of the curve below about 18.7°C.

It is remarkable that the curve runs horizontally below 18.7°C., and that the horizontal part seems to extend further as the curve runs below 14.8°C., the lowest temperature of the experiments. This leads to the supposition that the bottom deposits are so conditioned, at least in the particular case of the deepest part of Pond Takasukanuma, that the *p*H value remains constant, so far as the dissociation equilibrium in it is concerned, because the temperature of that part of the bottom does not exceed 17.5°C. throughout the whole year, as stated in the report cited.

It is of question whether these relations obtained can be applied in general to any type of lakes and to any part of their bottoms. In fact, even in Takasukanuma, the bottom is warmed to a higher temperature in its shallower part, and it is highly possible that *p*H varies with the seasons solely owing to dissociation equilibrium.

Studies will be continued further along these lines.

(1) *Japanese Journal of Limnology*, Vol. IV. No. 4.

Experimental.

Thoroughly kneaded sample (1 c.c.) is well stirred with 2 c.c. of distilled water for one minute, then a knife-tipful of quinhydrone is added and the mixture is stirred further for half a minute. A platinum electrode is inserted and *p*H is measured in 3 minutes potentiometrically referring to the saturated calomel half cell.

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