BULLETIN OF THE EARTHQUAKE
RESEARCH INSTITUTE
Vol. 36 (1958), pp. 135-138

7. *On the Geochemical Study of Carbon 14. (II). Agedating of Volcanic Product and the Rate of Peat Sedimentation.*

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(Read April 23, 1957.—Received March 31, 1958.)

1. Introduction.

In part I of this study[1], the age dating method with carbon 14 was applied to Ozegahara peat. An over-all view of the counting system is shown in Fig. 1, and Fig. 2 is an end-on view of the assembly in

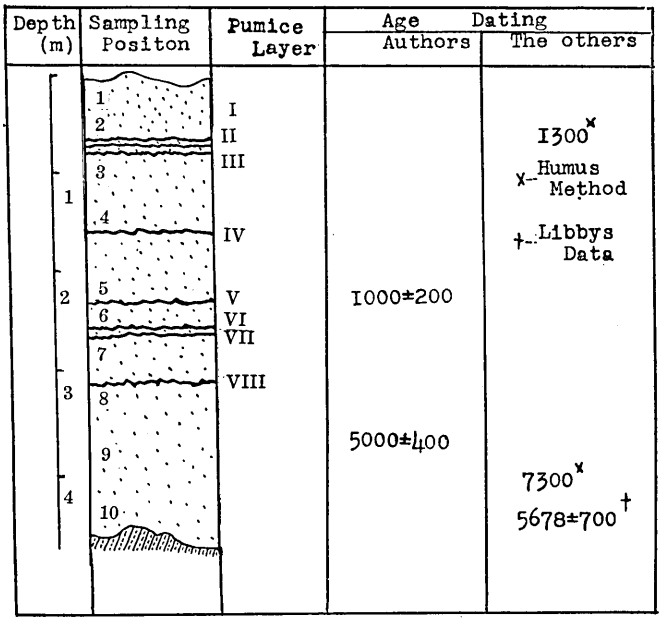

Fig. 3

place with the door of the shield. The peat layer was about 4.8 m thick and contains layers of volcanic products; the vertical section at Naka-

1) M. SHIMA, *Bull. Chem. Soc. Japan*, **29** (1956), 443.

tashiro is shown in Fig. 3. Results of age dating are also summarised in Fig. 3.

In Fig. 3 are also tabulated the ages calculated by Sakaguchi[2] from the rate of humus. A value of 5678 ± 700 was obtained at Chicago University[3] ; which made use the carbon 14 method on the request of the Ozegahara scientific research committee. This value being in an approximate agreement with the authors' results, the age of the layers of volcanic product was estimated on the basis of the authors experimental results on the age of peat and the rate of sedimentation.

2. Results and Discussion.

When the depth of the sediments was plotted against its age, a curve was obtained as shown in Fig. 4. Since the age of the samples used for age dating was known, it was plotted along the horizontal axis.

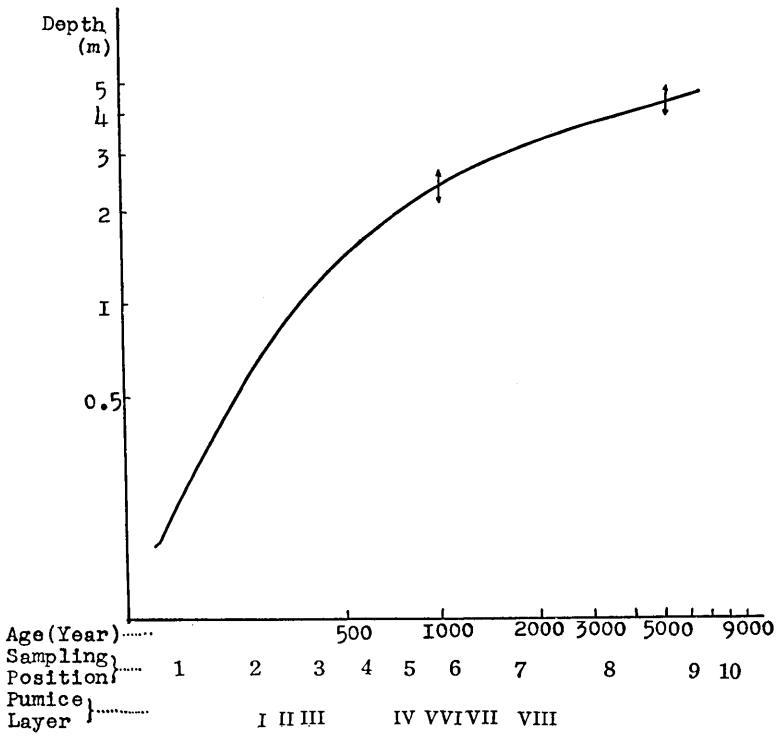

Fig. 4

2) Ozegahara Scientific Research Committee, *Ozegahra*, 63 (1952), 841.

3) *ibid.*

It was assumed that no significant change took place in the rate of sedimentation and the external condition for formation of layers, including compression of the volcanic product layer.

The age of formation of samples No. 2, 3, 4, 5, 6, 7, 8, 9, and 10 are approximately estimated as 250, 400, 580, 780, 1100, 1700, 3200, 6000, and 7800 years ago, respectively. On the basis of these values, the layers of volcanic product II and III seem to have sedimented about 300 years ago and those IV and V about 1000 years ago. When compared with the results on the rate of humus, (II, III, 1300 years ago, the peat layer at 4.8m depth, 7300 years ago) the present results for old layers agree well but new ones do not.

The rate of sedimentation was then estimated with the aid of the data in Fig, 4, for the layers from which the samples were collected. The approximate values are shown in Fig. 5; they are 5.5 mm, 3.6mm, 2.2 mm, 1.4 mm, 0.98 mm, 0.53 mm, 0.33 mm, 0.18 mm, 0.15 mm and 0.15 mm per year, for No. 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10, respectively. These values agree well with those calculated from their compressibility or prosity, experimentally determined[4]. It is clearly seen that the rate is remarkably greater for No. 1, 2 and 3. At the initial stage peat formation, the layer still contains vegetable organs without humus, resulting in greater prosity; it is subject to only slight compression near the earth-surface. Hence the apparent rate of sedimentation is apt to be overestimated. The deeper the location of the layer, the thinner its apparent thickness, owing to coalnification. This trend is promoted by occasional addition of volcanic products.

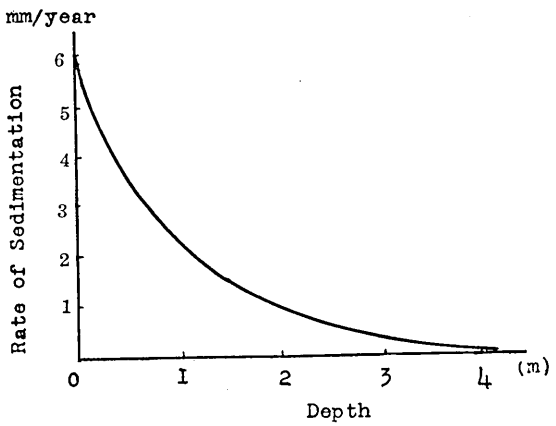

Fig. 5

According to the results on the rate of humus of organic substance, it is indicated that 5700 years passed between the formation of II and III layers and that of the deepest layer. This suggests that a layer as

4) N. YAMAGATA, Details of this will be published in the near future.

thick as 3.6 m was deposited within this period. Thus the mean rate of sedimentation is 0.78 mm per year, much greater than that (0.07 mm per year) for shallower layers than one meter. This does not agree with the common conception that the thickness of a layer decreases with time.

Although the carbon 14 dating method can provide only approximate values for samples as old as 1000 years, the authors' result appears to be more easily interpreted by the conventional concept about sedimentation.

3. Conclusion.

The age of various peat layers at Ozegahara and their rate of sedimentation were discussed with the aid of carbon 14 dating method and the age of layer of volcanic product was also estimated. For these which are older than 1000 years, (fairly) resonable results were obtained, that are consistent with the porosity or compressibility of the layers.

Closer study on each specimen is now in progress with reference to the age of volcanic products and lava.

Improvement of the activity measurement is also being tried with the aid of gas-flow counting method.

A part of the expenses for this study was defrayed from the grant given by Ministry of Education (Geochemical study of Volcanos) to which the authors' thanks are due.

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7. ^{14}C による地球化学的研究 (II)
火山噴出物の年代および泥炭の沈積速度について

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尾瀬ケ原泥炭層の年代決定に引続き，泥炭層の中に 8 層の火山噴出物があるので，これの年代を定めた．^{14}C による年代決定法と腐植速度からの計算を照合した．次いで，泥炭層の沈積速度を ^{14}C による年代から計算した．泥炭層の垂直方向の存在位置により，沈積速度は変化する．即ち上部と下部では異なつた結果を示した．

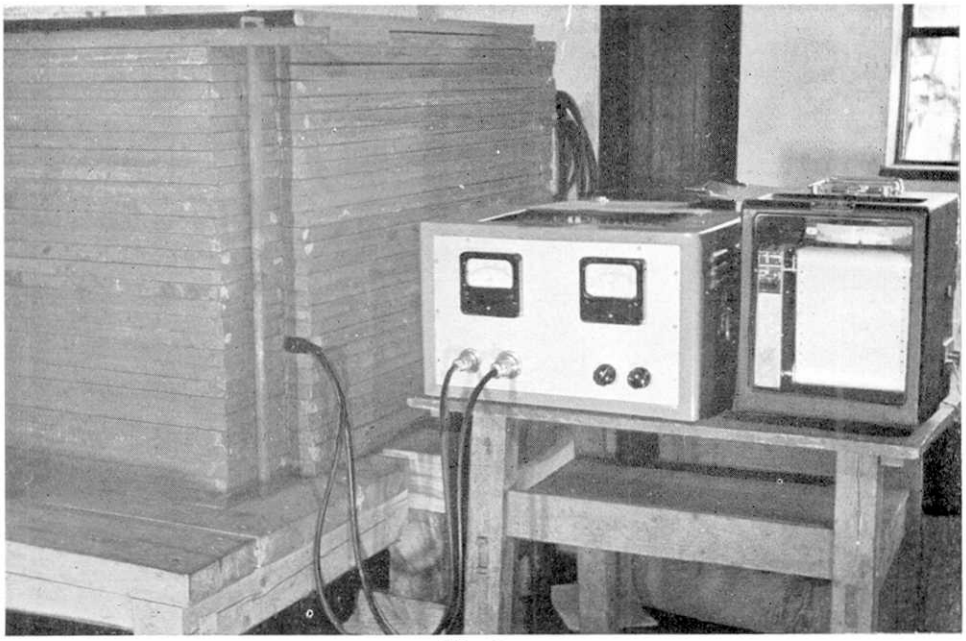

Fig. 1

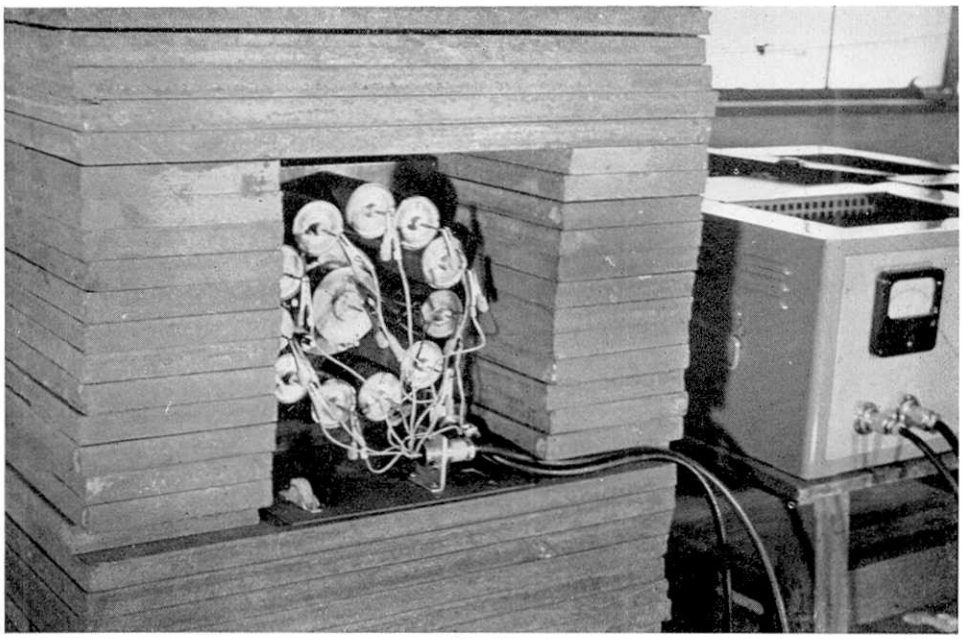

Fig. 2