that the drift mud that was interposed between these two layers at a later period has taken up material from the surrounding older layers. This explanation also applies to the sample of drift mud, K-156. With regard to the drift-mud sample K-122, this dating result is difficult to understand. If one does not anticipate contamination of this sample, the possibility exists of a renewed elevation of the island of swamp peat at a later time than the elevation which caused the deposit of drift mud of samples K-137, K-136, and K-156. There is at present no stratigraphic or geologic evidence that this happened. However, the investigations are not yet concluded, and the comments offered here are an attempt at a preliminary interpretation of the results obtained to date.

Conclusion

The main result of the age determinations is that the oldest agricultures in Switzerland (Older Cortaillod culture) and in Denmark (Younger Ertebølle culture and A-earthen vessel) started almost simultaneously, about 2740 ± 90 B.C. and 2620 ± 80 B.C., respectively. Furthermore, the first marked fall of the beech curve in Switzerland is essentially synchronous with the decline of the elm curve in the Danish diagrams.

References and Notes

1. E. C. Anderson, H. Levi, H. Tauber, *Science* 118, 6 (1953); J. Iversen, *Science* 118, 9 (1953).
2. H. Tauber, *Science*, this issue.
3. I wish to express my gratitude to the Carlsberg Foundation for a travel grant that enabled S. Jørgensen and me to go to Switzerland in 1952. The permission of the Heimatsvereinigung Wiggertal and of Emil Vogt, Landesmuseum, Zurich, to take samples for radiocarbon dating from the dwelling place Egolzwil 3 is highly appreciated.
4. E. Vogt, *Z. schweiz. Archaeol. u. Kunstgeschichte* 12, No. 4 (1951).
5. ———, in W. U. Guyan, Ed., *Das Pfahlbauproblem.* Monographien zur Ur- und Frühgeschichte der Schweiz, vol. 11 (Birkhäuser, Basel, 1955).
6. J. Troels-Smith, *ibid.*
7. H. Levi and H. Tauber, *ibid.*
8. Recently, Zeuner (*9*) published two datings from Egolzwil 3. The material was collected by W. Lüdi, Forschungsinstitut Rübel, Zurich, during the excavation in 1952. The expected date of the culture layer, according to Lüdi, is about 1900 B.C. ("The expected age is based on pollen analytical correlation, the absolute age being ultimately dependent on the Swedish varve scale.") The result of the dating is "G1.17, oak, 4000 ± 110 : c. 2050 B.C.; G1.18, ash, 4650 ± 110 : c. 2700 B.C." It would be of interest to know whether the material was taken from vertical piles or from piles imbedded horizontally in the culture layer. In the latter case, the settlement in this place would have lasted for at least approximately 500 years. However, the results of the pollen analyses are in favor of a very short-lasting settlement. A comparison of Zeuner's dating with those made in Copenhagen makes it reasonable to assume that the date of the culture layer is very close to 2700 B.C. (in agreement with Zeuner's sample G1.18) and that the settlement existed for a very short period. Zeuner's sample G1.17 is beyond the age of the culture layer; this can be explained if a vertical pile, which easily may have been driven in at a later period, has been dated.
9. F. E. Zeuner, *Eleventh Annual Report of the Institute of Archaeology, University of London* (1955).
10. H. De Vries and G. W. Barendsen, *Nature* 174, 1138 (1954).
11. C. J. Becker, *Aarbøger for Nordisk Oldkyndighed og Historie* (1947).
12. J. Troels-Smith, *ibid.* (1953).
13. Analyzed by Svend Jørgensen.
14. Drawn on the basis of analyses carried out by Svend Jørgensen and me.

Copenhagen Natural Radiocarbon Measurements II

Henrik Tauber

Archeological samples (*1*) from the earliest phases of the Neolithic period in Switzerland and Denmark were measured in the carbon-14 dating laboratory at Copenhagen during the period from February 1953 to May 1955 (*2*). All samples (Table 1) were excavated and submitted by J. Troels-Smith (*3*).

The Swiss samples originated from the neolithic lake dwelling Egolzwil 3, Wauwilermoos, Lucerne Canton. The settlement is of Older Cortaillod culture, and the samples were taken from a culture layer only a few inches thick and completely imbedded in sterile lake marl. The material used for the dating was wood, bark, and charcoal, which was very well preserved. The wood samples consisted of pieces of thin piles without bark; only the ten outer year-rings were used in the measurements (*4*). The settlement has been dated to the time immediately after the first strong beech fall in the Swiss pollen diagrams (*5*).

The author is on the staff of the Radiocarbon Dating Laboratory, Copenhagen, Denmark.

The Danish samples were taken from a neolithic dwelling place Mul. I, in the bog Aamosen, West Zealand, and represent the earliest (phase A, predolmen) Neolithic period in Denmark (*6*). The cultural remains, which are of late Ertebølle culture, were deposited in a thin layer on a floating island of swamp peat. Between this former floating island and the gyttja layer of the bottom of the former lake was found a layer of washed-in drift mud 10 to 40 centimeters thick. The mud contained cultural remains, which are contemporaneous with the cultural deposits from the dwelling place. The samples consisted of well preserved bark, hazelnut shells, and charcoal, as well as swamp peat and drift mud. The time of the settlement coincides with the elm fall in the Danish pollen diagrams.

The samples were measured by using Libby's solid-carbon method as described previously by Anderson, Levi, and Tauber (*7*). Twice during the period of measurements the laboratory was contaminated by fallout from nuclear detonations (October and November 1954 and April and May 1955). All measurements made during these periods have been discarded.

The calculation of the dates is based on a half-life for carbon-14 of 5568 ± 30 years (*8*). The ages are given in the fixed time scale (B.C. and A.D.), and each figure represents a separate run. The errors assigned to the dates include the statistical error in the net count of the unknown sample (e_s), the statistical error in the measurement of the activity of modern wood (e_r) which is used as a reference, and the error in the half life of carbon-14 (e_h). The possible effect of industrial combustion on the activity of modern wood has not been taken into account; such an effect, if present in the area of

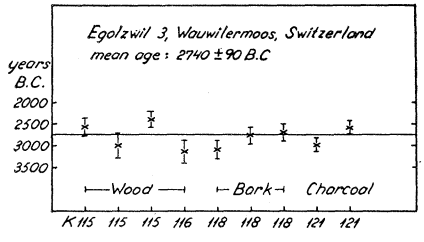

Fig. 1. Dating results from Switzerland.

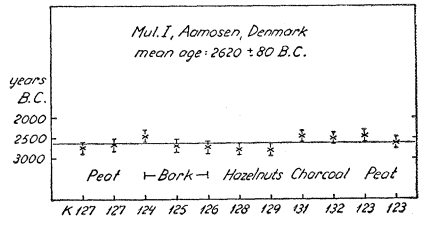

Fig. 2. Dating results from Denmark.

Table 1. Radiocarbon dates.

Description	Sample No.	Date (yr B.C.)
I. *Egolzwil 3 series, Switzerland*		
Spruce (*Abies alba* Mill., determined by B. Stüssi). Wood with no bark, placed horizontally in the middle of the western part of field II, 1952 (*5*). The wood was totally enclosed in the culture layer, which was locked up in lake marl. (E_3-101)	K-115	2560 ± 210 2990 ± 300 2380 ± 190 Average 2550 ± 150
Ash (*Fraxinus excelsior* L., determined by E. Tellerup). Piece of a thin pile with no bark; the wood had been attacked slightly by beetles. It was placed horizontally in field III, square 641, 1952 (*5*). Here the culture layer was hardly 1 cm thick, so the wood lay directly upon, and was covered by, lake marl. (E_3-105)	K-116	3130 ± 280
Bark from a large piece of lime bark (*Tilia* sp., determined by E. Tellerup). The large piece of bark was placed horizontally, with the outer side upward, in the northern part of field III, 1952 (*5*). The bark was placed directly on the lake marl and was covered by a culture layer about 1 in. thick. (E_3-81-84)	K-118	3080 ± 230 2760 ± 200 2690 ± 200 Average 2830 ± 140
Charcoal. Two samples of charcoal, the first of which consisted of 100 percent ash (*Fraxinus excelsior* L.), the second of 90 percent lime (*Tilia* sp.) and 10 percent elm (*Ulmus glabra* Huds.) (determined by E. Tellerup). The charcoal came from the lower part of field II, 1952 (*5*) and was totally enclosed in a 4-in. thick culture layer, which was placed upon and covered by lake marl. (E_3-111)	K-121	2970 ± 180 2570 ± 180 Average 2770 ± 130
Average date for the culture layer Egolzwill 3:		2740 ± 90
Lake marl. Sample situated immediately above the culture layer. The measurement was made on the inorganic carbon. The age has been calculated on the basis of the value for modern wood. (E_3-4)	K-119	3620 ± 170
Lake marl. Sample situated immediately underneath the culture layer. The measurement was made on the inorganic carbon. (E_3-7). Samples K-119 and K-120 indicate that "old" carbon has been incorporated into the lake marl and demonstrate that the dates obtained from lime samples should be treated with caution.	K-120	4350 ± 170
II. *Mul. I series, Denmark*		
A. *The dwelling place*		
Alderwood peat. Sample from immediately above the culture deposits. Slightly younger than the dwelling place. Position N5.25–5.50, E14.75–14.90. (Mul. I 16336 bø)	K-127	2730 ± 160 2670 ± 160 Average 2700 ± 120
Pieces of bark (*Alnus* sp., determined by E. Tellerup). The bark forms part of the culture layer and probably served as a covering of the floor. Cultural remains were found in and above the bark layer. Position N4.00–5.00, E6.75–7.25. (Mul. I 10711, 10712, 10703)	K-124 K-125 K-126	2450 ± 170 2690 ± 170 2730 ± 170 Average 2620 ± 120
Hazelnut shells. Found in the culture layer of the dwelling place. Position N7.00–10.00, E9.50–10.00. (Mul. I 178+)	K-128	2760 ± 160
Hazelnut shells. Found in the culture layer. Position N6.00–9.50, E11.00–11.50. (Mul. I 3361a+)	K-129	2790 ± 160
Charcoal (species not determined). Found in the culture layer. Position N6.00–10.00, E9.50–10.00. (Mul. I 165+)	K-131	2460 ± 150
Charcoal (species not determined). Found in the culture layer. Position N6.75–9.75, E6.50–9.50. (Mul. I 566+)	K-132	2510 ± 150
Average date of bark, hazelnut shells, and charcoal		2630 ± 80
Swamp peat. Found immediately underneath the culture deposits. Slightly older than the dwelling place. Position N9.25–9.50, E11.75–12.00 (Mul. I 11005)	K-123	2450 ± 150 2620 ± 150 Average 2530 ± 120
Average date for the dwelling place Mul. I		2620 ± 80
B. *Drift mud*		
Mud. Sample collected immediately above the layer of drift mud. Older than the dwelling place Mul. I. Position N13.00, E6.75. [Mul. I 26003 (II)]	K-148	3530 ± 170
Drift mud. Washed-in underneath the floating island, which was carrying the dwelling place. Taken immediately under the mud of sample K-148. Considered contemporary with the dwelling place. Position N13.00, E6.75. [Mul. I 26004 (III)]	K-137	3200 ± 160
Drift mud. Washed-in underneath the floating island. Placed immediately under the drift mud of sample K-137. Considered contemporary with the dwelling place. Position N13.00, E6.75. [Mul. I 26005 (IV)]	K-136	2970 ± 180
Calcareous mud. Located immediately underneath the drift mud of sample K-136. Only the organic fraction was used. Older than the dwelling place and slightly older than sample K-148. Position N13.00, E6.75. [Mul. I 26006 (V)]	K-149	3660 ± 180
Drift mud. Washed-in underneath the floating island. Considered contemporary with the dwelling place. Position N8.50, E11.75—that is, 4.5 m south and 5.0 m east of samples K-136 and K-137. (Mul. I 10715, 10716)	K-122	1830 ± 180 2260 ± 160 2090 ± 150 Average 2060 ± 110
Drift mud. Washed-in underneath the floating island. Considered contemporary with the dwelling place. Position N9.70, E6.20—that is, 3.3 m south and 0.5 m west of samples K-136 and K-137 (Mul. I 31177, 31178, 31179)	K-156	2850 ± 160

Copenhagen, would tend to make the ages slightly younger than the real ages of the samples.

The dating results from Egolzwil 3 and Mul. I are plotted in Figs. 1 and 2. The errors shown are statistical errors in the net count of the unknown samples (e_s) only; thus, from a statistical point of view, two-thirds of the dates should deviate less than the indicated error from the mean value. It is seen that the scattering of the dating results is in satisfactory agreement with statistics.

It can be concluded from the measurements that the early phases of Swiss and Danish Neolithic occurred almost simultaneously, the date of the lake dwelling Egolzwil 3 being 2740 ± 90 B.C., and that of the dwelling place Mul. I 2620 ± 80 B.C.

References and Notes

1. Samples suitable for carbon-14 dating are chosen by a committee consisting of Therkel Mathiassen (chairman), Helge Larsen and J. Troels-Smith, National Museum, Copenhagen, and Sigurd Hansen and Johs. Iversen, Danish Geological Survey (D.G.U.)

2. This work has been supported in part by grants from the Carlsberg Foundation and from the Danish State Research Foundation. I wish to express my sincere thanks to Hilde Levi for her continuous promotion of the work and to the

archeologists O. Voss, P. Kjærum, and E. Thorvildsen for their collaboration.
3. See the paper by J. Troels-Smith in this issue.
4. H. Levi and H. Tauber, in W. U. Guyan, Ed., *Das Pfahlbauproblem*. Monografien zur Ur- und Frühgeschichte der Schweiz, vol. 11 (Birkhäuser, Basel, 1955).
5. J. Troels-Smith, *ibid.*
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A. C. Kinsey, Zoologist

Alfred C. Kinsey, professor of zoology, Indiana University, and director of the Institute of Sex Research, died 25 August 1956, at the age of 62. Dr. Kinsey was born in Hoboken, New Jersey, 23 June 1894. His father was an engineer and taught at Stevens Institute, where Alfred later spent 2 years before deciding he did not want to be an engineer. He entered Bowdoin College, from which he graduated in 1916. While at Bowdoin and also in earlier years he worked in boys camps during the summer and acquired an interest in the out-of-doors and in living things, an interest that was incorporated into his high-school textbook on biology, published in 1926. After graduation from Bowdoin he entered Harvard Graduate School, where he studied with Merritt L. Fernald, William Morton Wheeler, W. E. Castle, and others. He was granted the Sc.D. degree in 1920. His last year, while he held a Sheldon traveling fellowship, was spent in the field collecting gall wasps. He jointed the faculty of Indiana University as assistant professor of zoology in September 1920 and rapidly advanced to the rank of professor in 1929.

During these earlier years at Indiana he continued his studies on gall wasps and published a series of papers on life-histories, taxonomy, geographic distribution, and evolution within the group. The most significant of these publications was on the origin of species in the genus *Cynips*, in which he defined a species as a population with common heredity. He was one of the first to correlate taxonomic studies with genetics.

Although Dr. Kinsey's interest in research was probably paramount, he was also a stimulating and provocative teacher. In advanced courses his method, where possible, was to permit students to reach their own conclusions from a study of specimens set before them or to learn as a result of their own efforts.

Dr. Kinsey's studies on gall wasps are now largely overshadowed by his more recent work on human sexual behavior, which he began in a small way in 1938 and continued without interruption until his death. His interest in this field was stimulated by students who came to him for counsel and advice on problems which he could not answer for lack of information. As he proceeded to find answers, his interest grew until finally the problems of sex became the dominant interest in his life. His approach from the beginning was that of a scientist seeking the truth, leaving moral and social implications to others. Gradually the immensity of the problems with their many ramifications and the difficulties of approach became apparent. It also became apparent that one man working alone could make but little progress toward solutions. With generous support, however, from Indiana University, the Committee on Problems of Sex of the National Research Council, the Rockefeller Foundation, and later from the income from the sale of his books, Dr. Kinsey was able to build a competent research staff without which progress would have been seriously handicapped.

From 1938 to 1947 Dr. Kinsey's researches on human sexual behavior were carried on within the department of zoology, but in 1947, for purposes of convenience and efficiency, the Institute for Sex Research was incorporated, and Dr. Kinsey was relieved of all teaching duties. He continued, however, to hold his professorship in the department.

Because of the scarcity of information, the greatest need at the beginning and throughout the study has been for more data, the facts of human sexual behavior. For collecting information, a personal-interview technique was developed, and the answers were recorded in code which could be read only by the few concerned with the research. To date 18,500 individual case-histories of men and women in various walks of life and from diverse regions of the United States have been recorded. Based on the information thus gained, two volumes, *Sexual Behavior in the Human Male* and *Sexual Behavior in the Human Female*, have been published, and others, including volumes on abortion, sex laws, and sex offenders and concepts of normality, are on the way or planned.

All studies, scientific or otherwise, in the field of human sexual behavior are certain to arouse criticisms because of diverse ways of looking at the subject, and Dr. Kinsey's studies have been no exception. But as time has passed and as emotion and prejudice have been replaced to some degree by sober thinking, the criticisms of Dr. Kinsey's research have become less bitter, and more supporters, realizing the values of the study, have come to its defense. Many of the criticisms came from persons who had not read the books and who did not want to read them. Some critics depended on newspaper and magazine articles which often distorted the truth. Criticisms based on misinformation and swayed by prejudice and emotion cannot be valid. Dr Kinsey, himself, was the most severe critic of his work from the scientific point of view. He did not pretend that he had the answers to all the problems. He realized the need for more data and better methods of analysis. If, however, he had waited until he had final answers to the problems, he would never have published. Science advances by degrees and can only approach solutions.

To demonstrate Dr. Kinsey's unselfish devotion to his work, it should be said that all income from the sale of his books, which were best sellers, was used to finance his research program.

Dr. Kinsey had interests other than university teaching and research on gall wasps and human sexual behavior, as is indicated by the publication of a high-school textbook in biology and the publication with Fernald of Harvard of a book on the *Edible Wild Plants of Eastern North America*. In his early years at Indiana he developed a beautiful garden in which he took special pride in his large collection of iris. Since boyhood he had had an interest in music and this interest was maintained throughout his life. He and Mrs. Kinsey collected a large series of records of classical music and invited their friends to their home for Sunday evening concerts. He was always a vivacious and entertaining host. Mankind is the loser by his untimely death, but what he has accomplished will live on. The gate to further knowledge has been opened and the path charted.

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