News of Science

Swanscombe Man

Two fragments of human skull, comprising the occipital and left parietal bones, were found *in situ* in the Middle Gravels at Swanscombe in Kent, England, by A. T. Marston in 1935 and 1936. Associated with the human bones were remains of other mammals and flint artifacts of the middle Acheulian phase of paleolithic culture. Except for their unusual thickness—which, however, can be matched in modern skulls—the human cranial fragments differ in no manner from the corresponding bones of modern or sapiens man. The Middle Gravels are generally accepted as belonging to the second interglacial period, some 200,000 to 300,000 years ago. That the skull fragments are indigenous to the stratum in which they are found and do not represent the remains of a burial or other artificial instrusion is not disputed.

On 30 July 1955 J. Wymer recovered the right parietal bone of a human skull from the same stratum as that in which the occipital and left parietal were found in 1935 and 1936 [*Nature* **176**, 426 (3 Sept. 1955)]. The three bones fit each other so well that there appears to be no doubt that they belong to the same skull. Numerous bone fragments, presumably of other animals, were found with the new parietal; these have been deposited at the British Museum (Natural History) for eventual identification.

Almost 300 primary and finishing flint flakes, 4 small, primitive hand-axes typical of the Acheulian industry of Swanscombe, as well as the point of a larger, finely finished hand-axe and a magnificent flake "knife," were found during the excavation. There can be no doubt that they are contemporaneous with the skull.

The positions at which the three skull bones were discovered form the vertices of a triangle with sides of 51, 49, and 24 feet. Inside this triangle remains a mound, of which a part is definitely undisturbed gravel of the skull zone. This area is now adequately protected and is being systematically excavated.

Through the kindness of K. P. Oakley, the undersigned was privileged to examine the newly discovered right parietal at the British Museum this past August. He harbors no reasonable doubt, in view of its morphology, that the new fragment belongs to Marston's original skull discovered some 20 years earlier. Also, in company with Wymer and Oakley, the writer visited Swanscombe and was permitted to participate in a day's excavation. During that time at least one nonhuman bone and numerous flint artifacts were unearthed, some of them within a few inches of the place where the new parietal had been found.

The Swanscombe skull is of the highest importance because of its relatively great age—being exceeded in age among the fossil remains of man in Europe only by the enigmatic Heidelberg jaw; for it not only is considerably older than the classic Neanderthalers of the fourth glacial period but also older than the earlier, more generalized Neanderthalers and the fragmentary Fontéchevade skulls of the third interglacial period, which are claimed by some to represent a sapiens type of man. Because the Swanscombe fragments are indistinguishable from the corresponding cranial bones of modern man, some enthusiasts have been led to accept as an established fact the existence of a true sapiens type in Europe contemporaneous with or even antedating the Neanderthalers. However, there is an apparent low degree of correlation between the braincase, face, and jaws of men during the first half or more of the Pleistocene epoch. In view of this, the fact that for Swanscombe man not a single scrap of the braincase or jaws—not even of the frontal bone, which might yield some clue to upper facial development—has as yet been discovered, makes such a conclusion premature, to say the least.

It has recently been claimed that the Steinheim skull, which combines a Neanderthaloid face and a substantially sapiens braincase, is second interglacial in age—rather than third glacial or third interglacial as formerly believed—and thus virtually contemporaneous with the Swanscombe skull. In consequence, it has again been suggested—as it was at the time of the original Swanscombe discovery—that the missing parts of the skull of Swanscombe man would resemble those of Steinheim man and thus would be Neanderthaloid rather than sapiens [*Science* **121**, 416 (25 March 1955)]. It must again be emphasized that this is quite as much of a guess as is the attribution of sapiens face and jaws.

The solution may lie within the mound inside the triangle at Swanscombe. Since the skull fragments already recovered exhibit very little abrasion from rolling, it seems not too much to hope that Wymer and his associates may eventually come across other, critical parts of the skull, and even of the postcranial skeleton, which would definitely reveal the true nature of the Acheulian man of Swanscombe.—W.L.S., JR.

Evaporograph

A new instrument, an evaporograph (EVA), that makes it possible to see in the dark has just been shown to the public for the first time by Baird Associates, Inc., Cambridge, an affiliate of American Research and Development Corporation. Using the device, which utilizes no electronic circuitry, a man can see a house a mile away in total darkness.

In operation the evaporograph is similar to a camera. The unit collects infrared radiation emitted from an object and focuses it as an image onto an oil film. The oil then evaporates away from point to point at rates varying with the amount of radiation received at each point. Seen in reflected light, these differences in oil film thickness appear as different colors, like oil films on water.

A detailed thermal picture of the field of view is thus obtained in color. This picture can be viewed directly or a photographic record can be made with a camera that is incorporated in the apparatus.

The unit is designed to observe radiation ranging from one to several thousand degrees F, and has a sensitivity that ranges down to about two-tenths of a degree. Accurate temperature measurements can be made either visually or photographically from this image.

EVA is housed in a cabinet 18 by 14 by 11 inches. Infrared radiation enters through a lens on one side and the operator views the oil film image through an eyepiece on the other. To date, Baird has built about a dozen of these devices for the military, each at a cost of about $9500.

The principle of operation was first demonstrated in Germany by M. Czerny. Work at Baird was originally suggested by Paul Ovrebo of the U.S. Air Force at Dayton, Ohio, and has been carried on there for the past five years. Much of the development, which has only just been declassified, was carried out under Signal Corps sponsorship. Bruce Billings, formerly research director and now vice president and general manager of Baird

Associates, was in charge of the project, and David Z. Robinson of Baird participated in the development.

Amateur Satellite Observers

The Astrophysical Observatory of the Smithsonian Institution has been assigned the task of initiating a nonprofessional satellite observation program, and Armand Spitz, director of the Spitz Laboratories, Yorklyn, Del., has been selected to act as coordinator of visual satellite observations.

Spitz will work with J. Allen Hynek, associate director of the satellite tracking program, and will supervise the coordination of the organized groups of nonprofessional observers throughout the country and the world. Among these are the Astronomical League, the American Association of Variable Star Observers, the Western Amateur Astronomers, the International Astronomical Federation, and others. Spitz will coordinate communication between these groups so that observations can be quickly transmitted to orbit computation headquarters.

Although the visual satellite observer corps will be operated on a volunteer basis, the selection of members will be based on skill and willingness to accept the responsibility for watching the sky at specified times. The principal reward to the observers will be the knowledge that their work will have unquestioned scientific value; without this assistance the satellites might be lost.

Appropriate recognition to observers who have participated in the program will be made by the officers of the satellite program so that observers will have a permanent record of their contribution. Observers who wish to participate in the satellite program should not write to Spitz directly, but should get in touch with their local amateur astronomy organizations, which will have received full instructions from central organizations.

New TB Vaccine

A new method of producing immunity to tuberculosis in mice was described recently by Guy Youmans, chairman of the bacteriology department at Northwestern University. The vaccine produced an immunity in mice equal to that found in mice immunized with BCG. BCG contains strains of living tubercle bacilli that have lost their power to produce disease, but still have the power to stimulate immune responses by the body. The new vaccine is made by grinding up tuberculosis bacteria and spinning them in a centrifuge to separate the different sized particles that are inside the cells. The particles are not alive but are still active as immunizing agents.

This is the first time that such separated, nonliving particles have been used successfully in producing immunity to tuberculosis. Chief members of the research team responsible for the development were Youmans, his wife Anne Youmans, and Irving Millman.

In the new method, tuberculosis bacteria were ground up in a sugar solution with powdered glass for 18 hours. This fragmented the membrane cover around the bacterial cells and let the inside contents escape.

The solution of suspended particles then was spun over and over again in an ultracentrifuge at speeds up to 40,000 revolutions per minute. Each time the solution was centrifuged, layers of fluid were separated and removed, until the different sized particles from within the bacteria were isolated in separate solutions or fractions.

To test whether any of these fractions could produce immunity, the investigators divided mice into three groups. One group received an injection of the fraction being tested; a second group received living BCG vaccine; and the third group received no injections. One month later the mice were infected with tubercle bacilli. Of the mice not protected, all died. Of those given BCG or the new vaccine, 60–70 percent lived.

Scientists in the News

LEON H. SCHMIDT, director of the Institute of Medical Research at Christ Hospital, Cincinnati, Ohio, has been awarded the seventh annual Eminent Chemist award of the Cincinnati Section of the American Chemical Society. The award was presented at the society's meeting on 23 Feb.

JOHN VON NEUMANN, member of the Atomic Energy Commission, recently received the Medal of Freedom from President Eisenhower. In a ceremony at the White House that was attended by Defense Secretary Charles E. Wilson and Adm. Arthur W. Radford, chairman of the Joint Chiefs of Staff, the President said that Neumann's work on "variously highly classified missions . . . resolved some of the most difficult technical problems of national defense."

WALTER H. ZINN, director of the Atomic Energy Commission's Argonne National Laboratory since 1946, has submitted his letter of resignation to the University of Chicago, which operates the laboratory. In his letter he commented: "As you know, the responsibilities as director of a research and development organization are complex and demanding. There is no reason to suppose that they will become less so in the future." He was asked to appear before the Congressional Joint Committee on Atomic Energy, but requested permission not to appear.

SIR BEN LOCKSPEISER will retire on 10 Mar. from the post of secretary to the Committee of the Privy Council for Scientific and Industrial Research, London. He is to be succeeded by H. W. MELVILLE, who is now Mason professor of chemistry at the University of Birmingham, Birmingham, England. Melville will take up his new appointment in August.

The following appointments to the faculty of the University of Michigan received approval of the regents at their meeting on 10 Feb.

HORACE W. DAVENPORT was appointed professor of physiology and chairman of the department of physiology in the Medical School, effective with the opening of the 1956–57 academic year. He has been professor and head of the department of physiology at the University of Utah College of Medicine since 1945.

THEODORE H. HUBBELL, curator of insects in the Museum of Zoology and professor of zoology, was appointed director of the Museum of Zoology, effective 12 Feb. His appointment fills the vacancy left by the death last May of Prof. J. Speed Rogers.

FRANCIS M. HENDERSON was named Fulbright lecturer in the department of engineering mechanics in the College of Engineering for 1956–57. He is senior lecturer in hydraulics in the School of Engineering, Canterbury University College, New Zealand.

JOHN C. AYRES was appointed associate professor of zoology, half time in the literary college, and half time in the Great Lakes Institute, beginning with the 1956–57 year. He also will be on a full-time basis in the Great Lakes Institute during the summer session. Ayres has been on the Cornell University faculty since 1949.

G. B. B. M. SUTHERLAND, since 1949 professor of physics and director of the Biophysics Research Center at the University of Michigan, has been named director of the National Physical Laboratory, London. Sutherland, who will take up the appointment next September, succeeds SIR EDWARD BULLARD, who retired on 31 Dec.

HOLGER ERDTMAN, Swedish chemist and expert on the chemistry of wood and wood products, visited the University of Illinois during February to deliver five talks in the annual Karl