

Taking to the sea . . . 9,000 years ago

Homer tells of heroic Greeks "singing over the wine-dark sea" about 1200 B.C. Archaeologists (dating various artifacts) have said that marine travel began about 6000 B.C. Now modern technology says the rosy-fingered dawn of seafaring actually came as early as 7000 B.C., and perhaps earlier.

S. A. Durrani, H. A. Khan and M. Taj are physicists at the University of Birmingham in England and Colin Renfrew is a historian at the University of Sheffield. Together they report in the Sept. 24 NATURE that fission track analysis has been used to confirm that there was sea trade between the Aegean island Melos and mainland Greece 1,000 years earlier than previously believed.

Evidence for this 75-mile trip comes from atomic analysis of obsidian (volcanic glass) discovered in prehistoric caves at Franchthi in southeastern Greece. Radiocarbon dating of the site placed the use of the obsidian tools between 7500 B.C. and 6800 B.C. The problem was proving that this particular obsidian came to the Greek mainland in boats from a known Aegean source rather than overland from known deposits in Hungary or central Turkey.

Optical spectroscopy, X-ray fluorescence, trace-element analysis and neutron activation are among the analytical techniques used for this purpose. But they are inconclusive when obsidians from different sources resemble each other in composition. "To over-



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Early trade: Obsidian came by sea.

come these problems," the scientists explained, "it seemed useful to consider other variables which might discriminate between sources. The date of eruption in which the obsidian was formed is one such parameter, and the fission-track analysis method of age determination was a possible approach." This, and the uranium content of the obsidian, showed that the Franchthi samples were formed almost 9 million years ago. Those from Hungary and Turkey proved to have been formed much later. But the age of the obsidian from Melos, also dated by uranium-fission tracks, matched exactly that from Franchthi. The chemical consistency of the two also tallied. And this, say the researchers, is the "earliest positive evidence available in the world, of the transport of goods by sea." □

Aspirin and birth defects: Fetal cell inhibition

Although aspirin has triggered defects in rat and mice fetuses, the evidence suggesting aspirin taken by women during pregnancy can harm their offspring has been circumstantial at best. Now, however, Thomas Paine of Nashville General Hospital and J. Nagington of the Public Health Service Laboratory in Cambridge, England, have shown that aspirin can dramatically arrest the growth of human embryo cells. Their study lends more weight to the argument that aspirin has teratogenic potential in humans.

The researchers took heart, lung, kidney and skin tissue from human fetuses 12, 14 and 18 weeks old, exposed the tissue samples to a salicylate (aspirin) solution, then cultured them. Fetal kidney cells were found to be highly susceptible to aspirin-induced growth inhibition; lung cells somewhat;

heart cells less and skin cells not at all. Identical results were obtained for cells from all three embryos.

This variation in fetal tissue susceptibility to aspirin recalls results of another study of a known human teratogen, the rubella virus. The virus was also found to depress, in human fetal tissue cultures, the replication of kidney and lung cells, but not of skin cells.

Also, the amounts of aspirin which were needed to inhibit fetal cell growth in Paine's and Nagington's study were comparable to the amounts of aspirin found in the umbilical cord blood of newborn infants examined in another study. These high concentrations ranged from 10.9 to 12 milligrams.

In view of the aspirin findings and the fact that women may consume large amounts of aspirin early in pregnancy, Paine and Nagington suggest that the effect of aspirin on the human embryo be more closely investigated *in vivo*. Their work is reported in the Sept. 22 NATURE NEW BIOLOGY. □

The nation's standard setter gets a Congressional review

In 1959 and 1961, Congress examined the National Bureau of Standards and found that it had inadequate facilities, staff and money to do its job. Now in 1971 "there are problems confronting the Bureau which, if left unattended, may result in difficulties not only for the Bureau, but for the nation as a whole," says a recent study done by the Library of Congress for the House Subcommittee on Science, Research and Development.

This month, Rep. John W. Davis (D-Ga.), chairman of the subcommittee, opened hearings for a "complete overview and review" of NBS "to inquire in depth into the organization, operations, functions and effects of this extremely important agency."

The hearings may result in a significant change to the original 1903 act establishing NBS. At the least, the act could be rewritten to include all of the subsequent jobs that have been assigned to the agency. But some NBS officials hope the hearings will also stimulate a change in philosophy and more public visibility for the agency.

NBS Director Lewis M. Branscomb welcomed the oversight hearings: "The need for such hearings is amplified by the swift changes overtaking the Bureau as it attempts to respond to demands placed on it by public needs, established in new legislation, or reflected in changing national circumstances within our original statutory responsibilities."

The Library of Congress study supports the need for hearings. As other problems, it cites the lack of funds to carry out the specific jobs given to NBS, and failure of Congress to act on NBS legislation.

But the basic question, the study says, is "to what goal should NBS be oriented?"

The original responsibilities, established by act in 1903 and amended in 1953, include custody, maintenance and development of the national standards of measurement; determination of physical constants and properties of materials; and cooperation with other Government and private groups in the setting up of standard practices.

But since 1953, Congress has added to these original jobs the testing of fabrics for flammability, establishing fair packaging and labeling standards and studying the metric system, to mention a few. NBS also has the job of developing Federal standards for automatic data handling and for building codes and pollution measurements.

The Bureau has an appropriated budget of only \$46 million a year and a staff of less than 4,000. It receives

an additional \$30 million a year for services to other Government agencies that they cannot do for themselves, and about \$3 million a year from industry. While work is in abundance, money is not. An estimated \$10 million is needed for the fire program research requested by Congress back in 1953, but NBS has gotten only \$3 million.

If the NBS is to continue to set the nation's standards, its laboratories must be unexcelled. But, says Branscomb, "We have permitted the state of the Bureau's equipment to fall far below the standard to which industrial laboratories maintain themselves." (Private industry invests about 10 percent annually into modernization of equipment; NBS only 2 to 3 percent.)

As significant as the funding question, however, is the one of philosophy: What should the Bureau be doing? The enabling act that established NBS contains no statement of philosophy, and there are varying opinions about what one should say. Secretary of Commerce Maurice H. Stans, under whom NBS operates, has said the Bureau's role is "assuring the maximum application of the physical and engineering sciences to the advancement of technology in industry or commerce."

Branscomb would like a more public-oriented wording: "to strengthen and advance the nation's science and technology and to facilitate their effective application for public benefit." This view of NBS could have important consequences. The Bureau does research on such common consumer items as tires—without advising on brand names. But much of the research is not made available to the public. While acknowledging that this hampers public visibility, one NBS official explained: "We are not a regulatory agency. If we got in the business of making public the research done for other agencies, we would create legal problems for others."

This kind of caution may be a legacy of the battery additive (AD-X2) case in the 1950's when NBS made public the fact that a manufacturer's additive was ineffective. In the process Allen V. Astin, then NBS director, was fired and then rehired. Since then NBS has assumed a low profile.

Whether the current hearings result in modifying the original enabling act of NBS, reorienting the philosophy, increasing the funding, or improving the laboratories of the nation's standard-maker is uncertain.

But some action on NBS is forthcoming. Bill HR 10766, coincidental to the committee hearings, calls for certain changes in the administration and fiscal practices of NBS. Also President Nixon's Government reorganization bill puts NBS in a business development role that diminishes its scientific role and is bound to attract criticism. □

Life in the inner city: Even worse since 1968

"Let your search be free. . . . Find the truth and express it," President Johnson said in July 1967 when he established the National Commission on Civil Disorders (SN: 4/6/68, p. 329). The commission, headed by Illinois Gov. Otto Kerner and composed of specialists in and out of the social sciences, was instructed to investigate the causes and effects of recent urban riots and to make appropriate recommendations. The President, however, did not agree with his commission's findings. They were rejected and the recommendations ignored. But ignoring a problem will not make it go away.

As if to prove this point the National Urban Coalition last week issued its Report of the Commission on the Cities in the 70's. It was co-authored by two men who had served on the original Kerner Commission: Sen. Fred Harris (D-Okla.) and Mayor John Lindsay of New York. Its task was to "take another inventory of the center city and determine what progress—if any—had been made." Sol M. Linowitz, chairman of the National Urban Coalition, says the new findings are released "with a deep sense of regret and shame."

The basic conclusion is that, "despite the Kerner Report's widely accepted finding that one major cause of the ghetto disorders of the 60's was the



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shameful conditions of life in the cities, most of the changes in these conditions since 1968—at least in the cities we visited—have been for the worse." They found housing still a national scandal and schools tedious and turbulent. The rates of crime, unemployment, disease and heroin addiction are higher. The welfare rolls are higher. And, with few exceptions, the relations between minority communities and the police are just as hostile as in the 60's.

Members of the commission visited the streets of Atlanta, Detroit, Los Angeles, Phoenix, Newark and El Paso. "We saw little in the physical conditions of those streets or of the neighborhoods around them to indicate that the protests of the Kerner Report had accomplished anything," the new report says. □

Throwing the biological clock off by altering a single gene

A blow for those who contend that inborn mechanisms control the timing of biological clocks (SN: 9/11/71, p. 178) has been struck by two California Institute of Technology biologists.

Hypothesizing that mutation of certain genes might lead to abnormal rhythms, Ronald Konopka and Seymour Benzer exposed *Drosophila* flies to a drug known to cause mutations, ethyl methane sulfonate. It did indeed upset the daily rhythmic cycles of both eclosion (emergence of the adult fly from the pupa) and locomotor activity. In one strain the rhythms were abolished altogether. In another, the 24-hour cycle of locomotor activity was shortened to 19 hours or lengthened to 29 hours. "The clock is still there," Konopka says, "but it is going at a different frequency." The changes in rhythms also carried over into subsequent fly generations. Recombination and complementation tests on these generations showed the rhythmic changes were due to the alteration of one gene, on the X chromosome.

The work is not final proof that the key to the biological clock is internal, but it shows, says Konopka, that "genes play a key role in determining or in specifying rhythms." The study is reported in the September PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. □

Stormfury finds Ginger a cooperative hurricane

After two years, Project Stormfury (SN: 8/21/71, p. 128) has finally found another hurricane suitable for seeding experiments. Last Sunday, Stormfury scientists began seeding Hurricane Ginger, a massive but ill-defined storm located about 750 miles east of Cape Kennedy. Research planes dropped silver iodide canisters in the storm's rainbands (curved bands of clouds with heavy precipitation) in an attempt to disperse the storm's energy over a larger area. Though the scientists noted changes in the cloud structure of the hurricane, R. Cecil Gentry, project director, said it was too early to judge the effects of the seeding. Ginger was seeded again Tuesday. □