# Book Reviews

## A Prehistoric Route to America

**The Bering Land Bridge.** Based on a symposium held at the Seventh Congress of the International Association for Quaternary Research, Boulder, Colorado, August–September 1965. DAVID M. HOPKINS, Ed. Stanford University Press, Stanford, Calif., 1967. 511 pp., illus. $18.50.

When submerged the Bering Bridge was the floor of a shallow sea whose currents drew many Mollusca north from the Pacific into the Arcto-Atlantic Ocean. Through most of the Cenozoic the bridge was exposed, and over its low plain broad-leaved deciduous trees, including oak, walnut, beech, and sweet and sour gum, intermingled during the Miocene. With colder times culminating in the evolution of tundra floras and tundra-adapted faunas, the bridge became a one-way street for Eurasian mammals. Between the Hemphillian and the Rancholabrean the percentage of New World mammals moving west dropped from about 33 to zero. The Eurasian immigrants define the last three North American "mammalian ages"—the arrival of deer (cervids) marks the start of the Blancan, the arrival of mammoth the Irvingtonian, and the arrival of bison the Rancholabrean.

A few who seemingly should have come across did not, as the Arctic-adapted woolly rhino. Nor did arrival in unglaciated Alaska guarantee access to the rest of the continent. At times there was still the Cordilleran ice barrier, and some mammals, the yak and saiga, for example, never made it to the Great Plains, where one imagines they might have thrived. Among the last and certainly the most significant of the newcomers was man himself.

Through the instigation of David Hopkins, Beringologists of six countries, including a number from the Soviet Union, gathered to build their own bridge of discourse at the Seventh Congress of the International Quaternary Association, in 1965. The subjects ranged through a variety of pertinent earth science fields on to biogeography and anthropology.

Through preliminary exchange of manuscripts, by incisive footnotes, and in a very perceptive summary, Hopkins sought to overcome the discontinuity to be expected when 27 authors author 23 separate chapters. While the Bering volume is the first of an expected series of post-Congress symposium publications, it is preceded by the encyclopedic 1000-page quarto-size *Quaternary of the United States* (Princeton University Press, 1965), the labor of some 90 authors.

Among the lively issues examined in *The Bering Land Bridge* is the matter of man's crossing. Laughlin reviews the Bering Sea mongoloid cultures whose origins may be traced back by radiocarbon dating about 8000 years and who may have arrived by boat rather than by land. From the archeological record of the last glaciation we know that in Europe ancient man mastered frosty tundra environments much earlier. Furthermore, according to Müller-Beck, the spear-point hunters of America, known to archeologists as Paleo-Indians, are not traceable on typological grounds to the burin-using Aurignacians of 12,000 to 15,000 years ago. Their Eurasian equivalents seem to be the Mousterians, and thus, despite lack of known sites in either Alaska or Siberia, the implication is a New World entry much earlier than the firmly established date of about 12,000 years ago.

Pollen records summarized by Colinvaux show that unglaciated Alaska and the bridge itself were covered by tundra, supporting a variety of large mammals, through the colder parts of the last glaciation. But between roughly 22,000 and 12,000 years ago any further passage east was blocked by the western edge of the Cordilleran ice sheet. Müller-Beck and Hopkins believe that man had arrived in the New World by the earlier date.

Indisputable evidence for man in the New World of this vintage or older has long been recognized as one of the greatest discoveries an American archeologist might hope to make. As a result there is a considerable search under way, and from time to time we hear enthusiastic claims of success. Granting the possibility that some of these may yet prove valid, it nevertheless seems to me that the discovery of early-early Paleo-Indians in the Americas is taking too long. By now their presence should have been firmly established and repeatedly verified.

My objection is simple. Few will dispute that the technology requisite to crossing the tundra of the Bering Bridge could be attained only by an adaptable people quite skillful at Stone Age life and fully capable of exploiting the abundant big game resources to be found in the New World. Could man have entered North America over 22,000 years ago without rapidly becoming an ecological dominant, leaving behind roughly as much imperishable evidence in the New World as archeologists find of this age in the Middle Upper Pleistocene of Europe? Without far more than the tantalizing bits of evidence claimed to date, one may regard the matter of 20,000-year-old man in America with considerable skepticism.

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## Properties of Materials

**Magnetism in Solids.** D. H. MARTIN. M.I.T. Press, Cambridge, Mass., 1967. 462 pp., illus. $19.95.

The study of magnetism has a rather long history, with a number of classics having been written in the past. Martin has added a fine, up-to-date book which attempts to cover both the experimental and theoretical aspects of this very broad field. The writing is at a level suited for introducing graduate students to the subject. Compared with other books that cover the same range at this level, Martin's book is very good. I am especially pleased to find a reasonable emphasis placed on the experimental situation. The emphasis in Martin's theoretical treatment is on systems that can be described as having well-localized magnetic moments. There is no attempt to cover recent progress in the description of itinerant magnetic systems.

The introduction to the subject given in the first chapter underscores the variety of experiments which are part

of the story of magnetism. These experiments include conventional magnetization and susceptibility measurements, neutron scattering, magnetic resonance, Mössbauer effect, specific heat, resistivity, and optical properties. Virtually all of the properties of matter reflect a transition to the magnetic state. I am not certain of the value of the 30 or so pages at the beginning of chapter 2 devoted to elementary quantum mechanics. I would guess that if one did not thoroughly understand the material in this section prior to reading the book, a great portion of the book would be incomprehensible. The treatment of a number of the topics considered emphasizes the physical aspects of the problem. In particular Martin's arguments for the quenching of the orbital momentum by the crystal field are extremely clear. Molecular-field models are used initially to characterize the various magnetic phases that occur in nature. It is good to see the inadequacies of the models illustrated by comparisons with particular magnetic systems. In the discussion of the exchange interaction between electrons there are several places where the simple but lengthy formal mathematics might have been streamlined. The last chapter of the book is devoted to describing the approximation techniques for obtaining the thermodynamic properties of localized magnetic systems in the low and high temperature regimes. The nature of the spin-wave spectrum for the various crystal structures and the high-temperature expansion technique are remarkably clearly presented.

Possibly the author has fallen short of his goal "to present a broad account of the subject which takes the discussion of major topics to the points of current investigation," but he does present us with an extremely readable introduction to the varied aspects of magnetism.

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## A Man One Did Not Forget

**The Difficult Art of Giving: The Epic of Alan Gregg.** WILDER PENFIELD. Little Brown, Boston, 1967. 428 pp., illus. $7.95.

At rare intervals a combination of inheritable and environmental elements, generously mediated by chance, permits the emergence of a "man for all seasons." Such a man was Alan Gregg. Fine of physique, charming in manner, endowed with intelligence and wit, he was a man one did not forget. Although never a teacher in the ordinary sense, never a practicing physician, rarely a direct contributor to scientific knowledge, he yet influenced countless teachers, physicians, and scientists. Moreover, he fashioned the giving of money into an art and endowed it with luster beyond the gold involved.

Even so, few lives deserve the epic characterization; yet Alan Gregg's probably does. But why? It is not easy to say, and herein lies the fascination of Wilder Penfield's perceptive biography. The answer is almost here, but not quite. The final essence to be distilled from the variegated public and private life of Alan Gregg still eludes us.

The son of a Colorado minister from New England, Gregg attended Harvard College, where he served on the *Lampoon* with such future savants as Walter Lippman, Gluyas Williams, Robert Benchley, and T. S. Eliot. Small wonder that he carried the marks of this association, and the bent they suggest, on to medical school and into his career. Following medicine at Harvard and a medical residency in the Massachusetts General Hospital, he declined a flattering offer to enter private practice, turning his face instead toward public health. A remark by an associate at the end of a busy day in the outpatient clinic seemed crucial in this decision. "I imagine a long line of people waiting to see me," said the young physician, "most with a sprained ankle because there is a hole in the sidewalk just down the street. I am so busy with patients who are in pain, however, that I never have a chance to get a shovel and fill up the hole."

But World War I intervened, and Gregg soon was in France with the British. His letters and diaries of the period are interesting in themselves, a worm's-eye view by one who could see the odd and the ridiculous and who could write. It was at this time that he began what Wilder Penfield terms a commonplace book, though Alan never named it. He kept it up throughout his life. Here were entered thoughts, often fragmentary, frequently enigmatic, and, though their author dated them, with no obvious relevance to the events of the day. Yet Gregg was too sensitive to the life about him for these to have been wholly irrelevant; rather, the input of events probably flowed through this complex being to emerge in often poetic notations.

At war's end, he was off to Brazil as a field-staff member of the Rockefeller Foundation's International Health Board. Long weeks were spent in the bush, fighting malaria and the anophiline mosquito by day, writing to Eleanor Barrows by night. The latter battle he won, and soon after the foundation called him back to New York they were married. Mrs. Gregg wrote long afterward, "We went to Carmel (California) because it was the most beautiful place we both knew—Alan found a minister whose name I do not know—. My mother, my nephew, my sister, my niece and my dog were present at the 'ceremony'—after which we bought a few groceries and drove down the coast to camp under the stars on the ocean's edge—. Proposal, engagement, announcement, wedding reception, wedding ring, etc. simply did not enter into the picture—and if *that's* not *Romance*—then I don't know what *is*. Our relationship lends itself more to poetry than to prose—. So it began and so it ended." Throughout their life together, the Greggs were content to shut their private lives away from the world; they entertained rarely, and she took little part in his professional activities.

But to move from the subtitle to the title of Wilder Penfield's book: Alan Gregg flourished in a time when $10 million was a lot of money; the Rockefellers and their most intimate advisers were frugal men, and so was he. They, and he, had the same high sense of responsibility, of which an essential offshoot is the necessity for hard work. This expressed itself in the industrious acquisition of facts, which, leavened with imagination, served as a basis for choosing the foundation's beneficiaries. Alan Gregg worked hard at the job of giving money for the improvement of medical education. First in Europe, where for seven years he headed the Paris office of the Rockefeller Foundation, and then during 22 years as director of the medical division in its New York headquarters, he assembled countless facts about medical schools and what they were doing that made him perhaps the best-in-