

to leave the impression that real advances have been made. In some papers it is difficult to distinguish evidence of the goals of the symposium. Those authors who mention Asiatic origins all too frequently do so only to mourn a lack of data, and to make the standard call for additional collection of data. The flyleaf of the book primes us with the emphatic statement that "The origins and evolution of the First Americans can only be appreciated as an event of intercontinental or interhemispheric proportions with international and interdisciplinary dimensions". This, a direct quote from the Introduction (p. 1), only serves to underscore my disappointment that few of the authors have anything at all to say about happenings on the Asiatic side of Beringia. Many good ideas are presented only to be followed by pleas for collection of supportive data, so that a test can be conducted in the future. In some of the more extreme cases, the papers thus end up sounding more like preambles to grant proposals (literature search, justification for additional research to be conducted, bibliography) than substantive contributions to ongoing research. In time, perhaps, we will tire of the growing tendency to publish ideas as soon as we get them, before we can test derived hypotheses. Given the promise of the symposium and the enthusiastic introduction, I expected more meat on these bones; failing this, I wonder if the book is really any more useful to us than a series of articles in the appropriate journals. We have here a chronicle of the encounter of a group of scientists; their cooperation is unclear.

As an example, no mention is made of the possible correlation of at least one skeletal pathology (ankylosing spondylitis) with an HL-A antigen (HL-A W-27), a finding that was easily available to symposium participants (Brewerton *et al.*, 1973; Bass *et al.*, 1974). The possible linkage of skeletal pathologies with immune reactions that are therefore detectable in both modern and fossil populations is not mentioned in Stewart's summary of skeletal pathologies, or Lampl and Blumberg's summary of HL-A data. Perhaps there is potential here for the documentation of a Founder's Effect in gene frequencies in both hard parts and soft parts — surely a topic worthy of at least passing mention in this forum, and a finding already suggested by the relative homogeneity of HL-A haplotypes in the New World.

In sum, I have the suspicion that the grand integrative goal that stimulated the symposium could not be attained, and that it is only approached in one or two of the papers and in the introduction. The latter, with some amplification, would therefore have made an excellent review article in an appropriate journal, whether or not it was accompanied by the other papers. Considering that the symposium was held in Austria, the participation of only one Russian researcher does not augur well for the health of east-west interchange of ideas and data. I come away from the book with the conclusion that in terms of communication and information, we are not much closer to the discovery of the "origins" of the First Americans than we were before the symposium. The consensus in the book points to Asia.

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PATTERNS OF VEGETATION AND HERBIVORY IN ARCTIC TUNDRA. Edited by G.O. BATZLI. Arctic and Alpine Research Vol. 12 No. 2. U.S. \$3.50.

Upon completion of the I.B.P. studies at Barrow, Alaska, a three-year study on vegetation and herbivory sponsored by the Division of Polar Programs (N.S.F.) was undertaken near Atkasook on the Meade River. Eight of the ten projects undertaken are reported in this issue of *Arctic and Alpine Research*. The papers include: summer climate (1), soils (1), plant communities (3), plant ecophysiology (2), and herbivory (4).

Haugen and Brown used regression analysis of air temperature data to show the pattern of increasing mean daily temperature and thawing degree days from the coast to 120 km inland. July mean air temperature averages $\approx 4^{\circ}\text{C}$ at the coastal stations, 9°C at Atkasook 48 km inland and $\approx 11^{\circ}\text{C}$ near the southern edge of the coastal plain. Thawing degree days near the coast average 300-650 $^{\circ}\text{C}$, 670 $^{\circ}\text{C}$ at Atkasook, and ≈ 1000 at 120 km. The 7°C July isotherm was used to mark the southern limit of the littoral zone characterized by an absence of shrub tundra and a preponderance of wet meadow tundra.

The papers by Billings and Peterson, and Peterson and Billings, describe the thaw-lake cycle near Barrow and the plant community patterns and succession at Atkasook, respectively. Both studies show the close relationship between microtopography-soil moisture-species distribution, and that geomorphic processes, controlled by ice-rich permafrost, play a central role in the long-term cyclic pattern of succession. As elsewhere in the Arctic, autogenic processes are quite minor in plant succession. Komarkova and Webber have prepared two detailed maps of plant communities at scales of 1:10 500 and 1:21 000. They also point out that soil moisture and permafrost are basic controls of vegetation as does Everett in his paper on soils. On a local basis, random variability in soil chemistry limits high correlations with plant community types.

The papers on the nutritional ecology of microtines (Batzli and Jung), the abundance and forage patterns of ground squirrels (Batzli and Sobaski, and habitat preference and forage consumption by caribou and reindeer (White and Trudell) are the most significant components of the study. For the first time, we have detailed data on the role that secondary compounds and plant growth form play in arctic herbivory. Evergreen shrubs are avoided by microtines, ground squirrels, and reindeer. Food selection by reindeer appeared to be related to plant availability, nutrient content, digestibility, and secondary compounds. These animals have a high preference for forbs, deciduous shrubs, and lichens, but they avoid leaves of *Carex* and favor *Eriophorum vaginatum* flower heads.

The nutrient allocation paper by Chapin shows that several preferred forage species (*Salix pulchra*, *Eriophorum vaginatum*) along with *Betula nana* and *Carex aquatilis* have high nutrient content, rapid growth, and large belowground storage relative to the evergreen shrub *Ledum palustre*. The deciduous species can rapidly translocate nutrients to new growth and the defoliation of *Eriophorum* and *Carex* results in large nutrient investment in new leaves. Only with chronic leaf defoliation is there root mortality. The paper by Archer and Tieszen stresses the importance of plant growth form (deciduous, evergreen shrub, forbs, graminoids) with regard to photosynthetic rates and carbon allocation. Carbon allocation to maintenance tissue or to long-lived stems and leaves is accompanied by mechanisms that reduce grazing.

Students of tundra ecosystems, and especially those interested in the role of herbivory in arctic systems, will find this issue of *Arctic and Alpine Research* especially valuable and the cost is low (\$3.50). These researchers, and especially Dr. Batzli, are to be commended for obtaining funding to publish their series of papers as a regular issue of a journal. The all-too-common practice of publishing a book results only in high prices, a limited number of copies and as a consequence, the reference books are purchased by only libraries rather than by researchers and their students. One hopes this journal has printed a large run of this number.

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