

survival, social stability and the value systems of individuals and groups that could be valuable to other Canadians in the event of a nuclear war.

Strategic Considerations: The committee concluded that "although modelling results must be interpreted with care, a prima facie case has been made that a nuclear winter will indeed follow a wide range of attacks." On the other hand, the Department of National Defence concluded that if the scientific findings of the nuclear winter studies are accepted, "strategic policy will not be affected in any profound manner." It would seem that nuclear winter is being treated as an unproven hypothesis. However, the military and strategic planners should be reminded that at one time the concepts of both the atomic and hydrogen bombs were unproven hypotheses. Fortunately, civilization was not at stake when they were tested. Hopefully, it will not take a nuclear war to convince people that nuclear winter will follow!

The paper from the department argues a case for deterrence, claiming it to be "the safest system within our present reach." The concept of deterrence is also a hypothesis, but one that the military continues to cling to relentlessly. Is deterrence at the present level of stockpiles now held really the safest system if by any far-out chance the weapons held by the nuclear powers were to be put into action by design, by an accident, by a bad communication or by some perhaps unknown factor, as remote as it may be? Surely deterrence at the level proposed by Carl Sagan, which would not create a climatic catastrophe, is a worthwhile intermediate goal that all politicians, strategists, military scientists, technologists and people in general around the world should be actively seeking if they are to be considered responsible stewards of this planet's environment?

The attitude on the part of the military that deterrence equates with security is flawed. The world today is far less secure than it was just prior to the nuclear arms race. Deterrence existed years ago when each superpower had enough ICBMs to wipe out a major city on the other side. Over the years, military planners and strategists have advised governments on both sides to increase their forces to the point that if they were used they would destroy civilization as we know it, partly as a result of nuclear winter.

Sagan has argued that in view of a possible climatic catastrophe, questions need to be raised about national and international security and hence the need for reducing world arsenals of nuclear weapons below the threshold level so this could not happen.

Conclusion: The Government of Canada and the Royal Society of Canada are to be commended for funding and producing this report on nuclear winter. It is an important document that should be read by thoughtful Canadians, especially scientists, politicians, the military planners and teachers. It is important that the report be followed up by research on some physical and biological aspects of nuclear winter but, more so, that a report on the social consequences of a nuclear war be undertaken. Above all, it is important for the Government of Canada to continue its efforts to avoid nuclear war by every possible means and by efforts in concert with other middle powers to put pressure on the nuclear powers to reduce their nuclear arms stockpiles so that nuclear winter can never happen!

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More than 20 years ago two noted Soviet scholars, S.I. Vainshtain and V.P. Diakonova (Trudy . . . , 1966, 1970), published extensive field reports on a large burial field at Kokel' in Tuva, U.S.S.R., with burial mounds or separate graves of Scythian, Hunno-Sarmatian, Old Turcic and recent (19th-century) origin. The Hunno-Sarmatian burials predominated. The field report was to be followed by analytical treatment of data by the excavators, but, as Roman Kenk tells us in the foreword, to date it has not been published. In view of the significance of the find, Kenk undertook to analyze the published data, focusing exclusively on the Hunno-Sarmatian or Shurmak burials. They are represented by four Great Burial Mounds (367 skeletons), 18 small burial mounds (76 skeletons), individual mounds of various forms including cenotaphs (28 skeletons) and 3 flat graves (4 skeletons). This he has done in an admirably systematic fashion. From the results obtained, the author inferred aspects of the cultural system of the people who used the Kokel' burial ground, according to Kenk, in the course of ca. 300 years, between 200 B.C. and 100 A.D. Their ethnic identity is left open, though, on the basis of physical anthropological and artifactual evidence, they are believed not to have been Huns.

The book falls into two parts: analysis of the published data (p. 9-89) and interpretation (p. 90-107). The rest (p. 108-202) is devoted to documentation: illustrations and tables.

Kenk reorganized the artifactual data (originally published by artifact categories) into a list that shows the artifactual inventory of individual burials within each of the burial mounds (Table 2, p. 166-185). He also compiled a table with the following information for each burial: the number of persons interred (single or multiple); age and sex of the skeletons; grave dimensions, with grave depth given in a separate column; orientation of the mound, grave pits and skeletons in terms of compass directions; and animal and plant remains found with the body or in the grave.

In the Introduction, Kenk summarizes the basic data about the Kokel' burial field and states that the main period of use falls into the period defined by L.R. Kyzlasov as Shurmak Culture, of the Hunno-Shurmak (Hunno-Sarmatian) Epoch, dating from the 2nd century B.C. to the 5th century A.D. There are both older (200 B.C.-200 A.D.) and younger (200-500 A.D.) phases (Kyzlasov, 1979, after Kenk, *Drevniia Tuva*). Kenk also points out that the Shurmak Culture finds from Kokel' are clearly distinct from Scythian finds there, as well as from other Scythian sites in the region (the Uyuk Culture). These finds are also different from the contemporaneous Tashtyk Culture of the Minusinsk Depression, although certain artifactual features permit Kenk to infer communication, interaction or exchange between the Shurmak Culture bearers of Kokel' and the Tashtykians of the Upper Enisei valley. Kenk suggests that the use of Kokel' burial ground by the Shurmak Culture bearers was relatively short, because the artifactual inventory (though separable into older and younger) does not demonstrate any significant changes over time.

In the following chapters (unnumbered) Kenk discusses the form and structural features of graves; modes of burial (extended prone with bodies placed directly on ground, tree branches, boards, or within a wooden construction, in log coffins, and, in exceptional cases, in wood or stone coffins, or sometimes surrounded by stones [p. 25:Fig. 13]). Occasionally, the wooden burial structure had a compartment for supplies (p. 25:Fig. 10). Variations in body arrangement also occur, although they are rare. These include burials flexed on the back or side, extended burials on the side, separation of the body and skull with the skull being placed in a separate compartment, skeletons without skulls and dismembered skeletons.

Grave inventories are discussed (p. 35-58) in meticulous detail. Throughout, Kenk refers to sex and age of the individual and is able to establish the grave goods complexes not only by gender, but also by age. He is able to demonstrate that the grave inventories for men show significant differences by age cohort (adult, mature and senile, the age cohort schema presumably according to the one established by Martin Saller, 1957). Careful attention not only to the occurrence of animal and plant remains, but specifically to their disposition within the graves and in relation to the body, permits him to conclude (in the second part

DAS GRÄBERFELD DER HUNNO-SARMATISCHEN ZEIT VON KOKEL', TUVA, SÜD-SIBIRIEN. By ROMAN KENK, based on site report by S.I. VAJNSTEJN and V.P. D'JAKONOVA. Kommission fuer Allgemeine und Vergleichende Archäologie des Deutschen Archäologischen Instituts Bonn, AVA-Materialien, vol. 25. München: Verlag C.H. Beck, 1984. 202 p., 62 illus., 2 tables, no index. In German. Softbound.

of this work — Economic Relations, p. 101-104), that the Shurmak Culture Bearers of Kokel' were pastoralists and that their economy was based on sheep herding. The sole agricultural product found, pease, in all likelihood was obtained through trade. Though Kenk is well aware that the absence of agricultural or blacksmithing implements may not necessarily imply a total absence of agricultural and ironworking activities, he is inclined to the conclusion that neither was practiced on a regular basis or as occupational specialization. Minute quantities of silk indicate some trade, probably indirect, with China, as do objects of gold and Han Dynasty mirror fragments. The gold objects are found almost exclusively in association with mature or senile male skeletons. On the other hand, local pottery manufacture (and not only trade in ceramics) are inferred, as are leather, woven cloth and felt manufacture.

That the Shurmak Culture bearers of Kokel' had conflicts with their northern neighbors, the Tashtyk Culture bearers, is inferred from bone points. Their positions in association with the skeletal material has led Kenk (p. 99) to conclude that they caused the individuals' death.

In a separate chapter (p. 59-89), Kenk establishes a relative chronology of the burial mounds and parts of specific burial mounds. He bases this relative chronology on selected diagnostic artifacts, especially the ceramics, illustrating the occurrence and co-occurrence of various vessel types in a separate table (p. 68-71). He supports his conclusions based on ceramics seriation with associated artifacts for which the temporal span is well known: knife types with specific grip forms; buckles with non-movable and movable pegs; bows of Hunnic construction (though not achieving the length typical of Hunnic bows); lance blades (which leads Kenk to conclude that the role of mounted warriors was growing); sword and dagger forms; and ear and neck rings. All of these elements are interpreted in association with other artifactual material. The analysis of arrow points is inconclusive. In general, Kenk considers the chronological relationships only as "tendencies pointing toward the temporal succession of some categories of finds" (p. 88). Nevertheless, he believes that the analysis of the artifactual inventory permits the narrowing of the time span for the Shurmak Culture at Kokel' to 100 B.C.-200 A.D.

Kenk's conclusion that Shurmak Culture bearers at Kokel' had an egalitarian social structure, with no distinction of rank based on other criteria than age, seems quite reasonable in the light of the data he presents: grave inventories vary with age for males, while female and child burials show little differentiation. I am less certain that Kenk's conclusion is valid that all but one of the great burial mounds was utilized by a single kinship group over time. The exception is seen as shared by two different kinship groups using different sections of the mound: anthropomorphic sculptures occur in one section, zoomorphic sculptures in the other. Still less certain is the conclusion based on the same evidence that ancestor veneration was practiced, or that zoomorphic sculptures suggest totemism.

The sections on art (p. 105) and religion (p. 106-107) are the weakest part of the book. To be fair, recovered objects that may be classified as art are few. They include a small number of highly stylized, schematically rendered, wooden anthropomorphic and zoomorphic figurines mentioned above and a few objects colored in black and red and ornamented with crisscrossing diagonal lines (Fig. 41-6). Ceramic designs and gold ornaments are not considered by Kenk in this context.

The inferences about the religious beliefs are, to say the least, superficial. Shamanism, stated to be characterized by achievement of trance, is inferred on the basis of occurrence in a few graves of *Canabis sativa* L., although there is no evidence that it was smoked (p. 34, 107). The occurrence of stylized wooden carvings of horses is interpreted as an indication of totemic beliefs (p. 107). The remnant of a leather garment on an anthropomorphic figurine is interpreted as indication that these figurines represented real human beings (p. 107), and hence ancestors.

Technically, the book suffers from the absence of an index. I also found it difficult to relate the text to illustrations, as all illustrations are arranged with reference to the two main Tables 1 and 2 (see above). I also found annoying the lack of statements of dimensions or scale of various artifacts in the illustrations, though some ranges are given in the

text. A better referencing of pertinent literature is also desirable, and the lack of bibliography on archaeology of Tuva, especially for recent publications, is a minus.

In spite of these shortcomings in matters of interpretation and technicalities of presentation, the book contributes to our understanding of archaeological data of the Hunno-Sarmatian period in Tuva and should be useful to and welcomed by specialists.

REFERENCES

- KYZLASOV, L.R. 1979. Drevniaia Tuva. Cited after Kenk. No other publication data available.
 MARTIN, R., and SALLER, K. 1957. Lehrbuch der Anthropologie. 3rd ed. Stuttgart: Gustav Fisher Verlag.
 TRUDY TUVINSKOI KOMPLEKSNOI ARCHEOLOGO-ETNOGRAFIKE-SKOI EXPEDITSII. 1960, 1966, 1970. Vols. 1, 2, 3. Moscow/Leningrad.

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BOOKS RECEIVED

- ANTARCTIC SCIENCE. Edited by D.W.H. WALTON. New Rochelle: Cambridge University Press, 1987. (Cambridge University Press, 510 North Avenue, New Rochelle, N.Y. 10801, U.S.A.) ISBN 0 521 26233 X. 280 p., col. and black & white photos, figs., selected bib., index. Hardbound. No price indicated.
 ARCTIC AIR POLLUTION. Edited by B. STONEHOUSE. Cambridge: Cambridge University Press, 1986. Proceedings of an international symposium on arctic air pollution held at Scott Polar Research Institute in Cambridge, England, 2-5 Sept. 1985. ISBN 0521 330009. xvi + 328 p., figs., tables, index. Hardcover. £30.00 (US\$49.50).
 CANADA'S SUBARCTIC UNIVERSITIES/LES UNIVERSITÉS CANADIENNES DU MOYEN NORD. Edited by PETER ADAMS and DOUG PARKER. Ottawa: ACUNS, 1987. (Association of Canadian Universities for Northern Studies, 1915 - 130 Albert, Ottawa, Canada K1P 5G4.) ISBN 0-921421-01-X. xv + 282 p., figs., tables. In French and English. Softbound. No price indicated.
 DETECTION AND CLASSIFICATION OF ICE. By EDWARD O. LEWIS, BRIAN W. CURRIE and SIMON HAYKIN. Letchworth, England: Research Studies Press Ltd., 1987. (Research Studies Press Ltd., 588 Station Road, Letchworth, Herts. SG6 3BE, England; or John Wiley & Sons Inc., 605 Third Avenue, New York, N.Y. 10058 U.S.A.) ISBN 0 86380 058 0 and 0 471 91641 2. xviii + 325 p., figs., tables, bib., appendixes, index. Hardcover. US\$77.95.
 GAZETTEER OF INUIT PLACE NAMES IN NUNAVIK (QUEBEC, CANADA). By LUDGER MÜLLER-WILLIE. Inukjuak, Quebec: Avataq Cultural Institute, 1987. In conjunction with Inuit Elders of Nunavik and Avataq Cultural Institute. Inuktitut translation by Sarah Naluktuk, French translation by Marie-Cecile Brasseur. (Available from Nortext Information Design Ltd., Suite 200, 16 Concourse Gate, Nepean, Ontario, Canada K2E 7S8.) ISBN 1-55036-000-0. xvii + 368 p., illus., map, in English, French and Inuktitut. Cdn\$29.95 (Softbound) or Cdn\$39.95 (Hardcover) plus \$2.50 for postage and handling.
 HAA SHUKA, OUR ANCESTORS: TLINGIT ORAL NARRATIVES. Edited by NORA MARKS DAUENHAUER and RICHARD DAUENHAUER. Seattle: University of Washington Press, 1987. Published for the Sealaska Heritage Foundation, Classics of Tlingit Oral Literature, Vol. 1. (University of Washington Press, P.O. Box 50096, Seattle, WA 98145-5096, U.S.A.) ISBN 0-295-96494-4 cloth, 0-295-96495-2 paper. 532 p. illus., notes, biog. bib. US\$17.50 (Softbound) or US\$35.00 (Hardcover).
 HINTERLAND OR HOMELAND? LAND-USE PLANNING IN NORTHERN CANADA. Edited by TERRY FENGE and WILLIAM E. REES. Ottawa: CARC, 1987. (Canadian Arctic Resources Committee, 111 Sparks Street, 4th Floor, Ottawa, Canada K1P 5B5.) ISBN 0-919996-31-0. xii + 161 p. Softbound. No price indicated.
 ICE SEAMANSHIP. By GEORGE Q. PARNELL. London: Nautical Institute, 1986. (The Nautical Institute, 202 Lambeth Road, London SE1 7LQ, England.) ISBN 1-870077-01-6. 87 p., figs., index. Softbound. £17.
 INUIT KAYAKS IN CANADA: A REVIEW OF HISTORICAL RECORDS AND CONSTRUCTION. By E.Y. ARIMA. Ottawa: National Museums of Canada, 1987. Paper No. 110 of Canadian Ethnology Service, Canadian