

PART 1

GENE-CULTURE COEVOLUTION OF INCESTUOUS AND CONSANGUINEOUS UNIONS

Introduction

Westermarck (1891: 320) proposed that “there is an innate aversion to sexual intercourse between persons living very closely together from early youth.” Sibs usually grow up in the same household, whence this psychological effect would function to prevent brother-sister mating. However, avoidance is also predicted when unrelated boys and girls are reared together, and studies on marriage patterns of Israelis socialized in kibbutzim (Shepher 1983) and on the Chinese custom of *sim-pua* (Wolf 1995) seem to support this prediction. In particular, the *sim-pua* is a girl who is adopted, often as an infant, into a family with a young boy, to be his future bride. Compared with other arranged marriages, the fertility of this type of marriage is low, and the divorce rate is high (Wolf 1966, 1968, 1970, this volume).

The four papers in this section address the Westermarck hypothesis in four contrasting ways. In the first paper, Aoki Kenichi, Satoh Daisuke, and Roger Levy argue that humans may have evolved to tolerate a low rate of brother-sister mating—as opposed to its complete avoidance. Humans are subject to inbreeding depression, i.e., inbred offspring suffer a higher mortality than outbred offspring (e.g., Adams & Neel 1967, Seemanová 1971, Bittles this volume). Hence, there is natural selection against (close) inbreeding. Nevertheless, if mating with a sib rather than an unrelated partner permits a head start in reproduction, there may be a net advantage to a mixed strategy of occasional sib mating. The prediction is derived from an age-structured population genetic model motivated by the work of Keller and Arcese (1998).

In modern human societies, age at marriage is lower when the spouses are related than when they are unrelated. Perhaps because of this, cousin marriages, in particular, enjoy a higher fertility (live births) than non-consanguineous unions (Bittles 1994, this volume). Brother-sister marriages were common in Roman Egypt (e.g., Scheidel 1996, 1997, this volume). When marriages in Roman Egypt are broken down by age, there is a relatively higher incidence of brother-sister and other close-kin marriages among the younger couples. Thus it is possible that sibs were marrying earlier than unrelated individuals (Bagnall & Frier 1994). These considerations provide support for Aoki et al.’s premise.

Alan Bittles is well known for his work on the social and biological aspects of consanguineous unions, i.e., uncle-niece marriages, first cousin marriages (of which there are four

types), etc. In the second paper of this section, he reviews the surprising variation among societies in their prevalence, with reference to religious attitudes, civil legislation, and social preference. Bittles also reviews the evidence on fertility of related couples and on mortality of inbred offspring (as mentioned above).

There are at least two ways in which the study of consanguineous marriages is relevant to a gene-culture coevolutionary understanding of brother-sister mating. First, consanguineous and brother-sister marriages may be prohibited or preferred for the same reasons. Second, there is an extensive dataset of consanguineous marriages from which the inbreeding depression can be reliably estimated. In particular, a comparison of death rates among children of cousin marriages and non-consanguineous marriages in 38 populations yields an excess mortality of 4.4 percent in the former group (Bittles & Neel 1994, Bittles this volume). Extrapolating to the case of offspring of sibs gives 16.1 percent. On the other hand, a direct estimate of inbreeding depression in the offspring of brother-sister and father-daughter incestuous unions based on 18 such couples and 18 controls is 29 percent (Adams & Neel 1967).

Walter Scheidel is a classics scholar with an interest in institutionalized close-kin unions among commoners. The third paper of this section begins with an excellent historical review of “incest” in Zoroastrian Iran and Roman Egypt. According to Zoroastrian doctrine as revealed in literary texts, the practice of *xwedodah*—sexual union between parent and child or between brother and sister—is highly meritorious. Unfortunately, it is difficult to estimate the actual incidence of *xwedodah* in the Zoroastrian society.

By contrast, demographic evidence on brother-sister marriages in Roman Egypt is available in the form of census returns, about 300 of which have survived on papyrus. Of 121 marriages attested in these documents, twenty are between full sibs and four between half sibs (Bagnall & Frier 1994). Given the low life expectancy and a preference for younger wives, the incidence of brother-sister marriages perhaps approaches the demographically possible and socially acceptable maximum (Scheidel 1995; see also Hopkins 1980). Although Scheidel is unable to explain the popularity of brother-sister unions (he is in good company in this regard), he shows that the phenomenon may not be inconsistent with the Westermarck hypothesis given the age difference between sibs and the likely employment of wet nurses (see also Wolf this volume) in Roman Egypt.

The fourth and last paper of this section by Arthur Wolf bears directly on the Westermarck hypothesis. His work in Taiwan, spanning almost half a century, has shown unequivocally that “minor marriages” in which the sim-pua are adopted at an early age are on average less fertile and more often end in divorce than other arranged marriages. However, this generalization masks considerable variation in the “sensitivity to the experience of being reared with a potential sexual partner” (Wolf 1995: 259). In fact, a minority of “couples ... were not sexually indifferent to each other, not even when ... brought together as early as one or two years of age” (Wolf 1996: 253).

In this paper, Wolf looks more closely at age-related and sex-dependent variation in sexual attraction among minor marriages using two specially constructed indices. In particular, he shows two things. First, when the wife is adopted as an infant after the husband is born, and the husband's age at his wife's adoption is varied, both indices remain uniformly low until age eight, after which they rise sharply. Second, when the husband is born after his wife is adopted, and the wife's age at his birth is varied, both indices are again uniformly low until age five (upper age limit of reliable data). Hence, among other things, when the younger partner is an infant at first association, the aversion is equally strong whether the younger partner is male or female.

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