



Malnutrition, Social Inequality and Natural Selection in Human Populations

R. Khongsdier

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ABSTRACT This chapter describes growth and development as a measure of health and nutritional status as well as a good evidence of human plasticity in response to different environmental conditions. It also describes social inequality as a possible mediator of natural selection that is often responsible for different modes of adaptation. Malnutrition still remains a major health problem in developing countries. It is often measured by a poor anthropometric status, or growth retardation, which can be considered an outcome of the complex interaction between genetic and environmental factors. One of the characteristics of such complex interaction is *developmental plasticity*, which refers to any observable modification or phenotypic variation in response to a sequence of environments during growth and development or throughout life. Developmental plasticity may be reversible in one aspect, irreversible in other, and have serious health consequences in later life in some other aspects. The other dimension of developmental plasticity is *canalization*, or a set of processes to keep the observable variation constant, despite genetic and/or environmental variations. Neither too big nor too small body size, for example, is necessary good for health and well-being. As a blind natural force, natural selection may act at any deviation from some threshold of a *delicate balance* between our biological make-up and the environment. The success or failure of a given observable trait is conditioned by the reaction norm of genotype, an essential property of developmental plasticity, which may be assumed to operate in accordance with the process of canalization. A better understanding of developmental plasticity and canalization is of considerable importance to many aspects of organic life, including health and well-being of human populations. Malnutrition and infections, which ultimately lead to higher morbidity and mortality, are common phenomena among the lower classes in developing countries, thereby looking as though the poor or lower classes were often the victims of natural selection. There is no biological justification for social inequality in health and nutritional status. Natural selection in the lower strata of social stratification does not result in a long-term beneficial adaptation. However, Darwinian fitness tends to be highest in the higher strata of social stratification through its effects on health and functional capability.

Author's Address: Dr. R. Khongsdier, Department of Anthropology, North-eastern Hill University, Permanent Campus, Shillong 793 022, Meghalaya, INDIA.
E-mail: rkhongsdier@hotmail.com and rkhongsdier@sancharnet.in