METAPTATION: A DESCRIPTIVE CATEGORY FOR EVOLUTIONARILY VERSATILE PATTERNS OF GENETIC AND ONTOGENETIC ORGANIZATION

David G. King
Dept. of Anatomy and Dept. of Zoology
Southern Illinois University
Carbondale, Il 62901

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ABSTRACT: Traits which create potential for efficient adaptive evolution are shaped by natural selection acting at the "second tier" , at the level of differential speciation and extinction. Evolutionary versatility is not merely a fortuitous byproduct of certain adaptations. A lineage whose genomic organization has permitted effective evolutionary change in the past can pass this capacity, with additional modifications, along to descendent branches. The result of such selection has been a gradual improvement in mechanisms which facilitate the appearance of viable heritable variation, and hence an evolutionary increase in the ability of species to facilitate their own evolutionary transformation.

"Metaptation" (from *meta* to change + *aptation* fitness) is offered as a name for evolved patterns of biological organization which promote evolutionary versatility by causing and constraining mutation and by ontogenetically accommodating to the consequences of mutation. Many mechanisms for actively encouraging genetic variation are already known to exist. Recognizing that such mechanisms have evolved for this role, selected on the basis of past contribution to evolutionary survival, offers a paradigm for investigating the nature of genetic and developmental function. Organizational patterns which confer long term evolutionary versatility may be as sophisticated and as fundamental as the patterns which provide for immediate adaptive morphogenesis.

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