

ton; with the animal mechanics of Marcy, Allen, and Mui-bridge; with palaeobotany, geology, and historical-physical geography. In these points we cannot be too broad. All structures should be considered as to their homologies, their mechanics, which throw such a brilliant light upon their evolution; their relations to the food and soil, and to other parts. This brings us to the animal as a whole — its tendencies, its place in the system of descent, its relations to its contemporaries, the causes of its progression or retrogression; finally, into pure speculation. Here I am reminded of a critical saying by the late Professor v. Gudden, the distinguished neurologist: "Ein Steinchen der Wahrheit hat mehr Werth als ein grosser Schwindelbau"; it was in allusion to the temporary character of the great nerve-tract systems of Meynert and Flechsig. The great 'Schwindelbau,' literally the 'disappearing structure' of palaeontology, is the phyletic tree which adorns the end of many good as well as superficial papers; and recently, because of its extremely brief life, has fallen somewhat into disfavor. I do not think the present reaction against these 'trees' is a wise one; we must remember they are the working hypotheses of our branch of science and serve to most clearly express present knowledge.

To illustrate some of these principles of modern methods, let us first look at the evolution of the teeth in the rise of the mammalia. The teeth and the feet are the foci of mammalian evolution, the only direct points of contact with food and the earth. Their combined use in phylogeny has increased in interest, because their evolution has proved to be wholly independent. We recall Cuvier's famous law, of which Balzac said at the time: "Rebuilt like Cadmus cities, from a tooth."

No generalization has been more thoroughly routed than that of a necessary law of correlation between tooth and foot structure. Besides the orthodox clawed carnivores and hoofed pachyderms of the great French anatomist, we have discovered hoofed carnivores such as *Mesonyx*, and clawed pachyderms such as *Chalicotherium*. Even the apparently lasting barriers of correlation, which Owen raised between the even and odd-toed ungulates, have broken down by Ameghino's discovery of