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ECOLOGY

Carnegie Blows Up Biodiversity

To assess the effects of anthropogenic changes on biodiversity, we need to know not only what exists but what existed, Dolan contends in an analysis of historic plankton samples collected on the final cruise of the ship *Carnegie* during 1928–1929. Built for oceanography, on its last global voyage it was equipped to systematically collect plankton. Plankton were obtained from 160 sampling stations. Three groups were chosen for identification and counting to represent distinct trophic levels: small copepod crustaceans, *Ceratium* dinoflagellate alga, and ciliate zooplankton called tintinnids. Reanalysis of these collections revealed that changes in species richness were correlated for the three groups, and more species were collected at the tropics than at high latitudes. Interestingly, of the several hundred species, most were rare and few were common. Although potentially a rich source of now-unfunded taxonomic expertise, historical data do have gaps and study design issues that cannot now be resolved. Sadly, the *Carnegie*'s adventure came to an end when it, and its scientist, Captain Ault, were blown up while refueling in Samoa. — CA

J. Plankton Res. 33, 10.1093/plankt/fbr060 (2011).

DEVELOPMENT

Controlling Sex

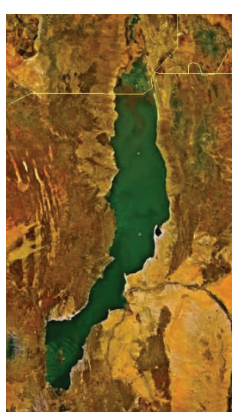
Chromosomes are packaged into transcriptionally silent heterochromatin and transcriptionally active euchromatin. The highly conserved protein HP1a marks heterochromatin in *Drosophila,* and heterochromatin-rich telomeres are capped by a protein complex composed of HP1a and HP1/ORCAssociated Protein (HOAP). Because knockdown of HP1a is associated with loss of male viability, and the HP1a-HOAP complex shows similarity to the mammalian sex-determining region of the Y chromosome (SRY), Li *et al.* sought to investigate the role of this complex in regulating sex determination in *Drosophila*. The authors carried out gene expression analysis in HOAP-deficient flies and found that the majority of down-regulated genes were those associated with the testis. Further analyses showed that this was due to repressive activity by HOAP and both repressive and activating functions of HP1a that affected the function of the establishment promoter of *Sex-lethal*, the master regulator of sex determination. Flies mutant in HP1a or HOAP exhibited defects in sex determination. Thus, proteins typically associated with heterochromatin are critical for regulating the changes in gene expression required for sex determination in flies. — LMZ

PLoS Genet. **7**, e1002122 (2011).

CLIMATE SCIENCE

In Synch with the Weather

Cooling climates in Africa over the past 10 million years have led to substantial environmental changes that might have influenced human evolution. Demonstrating a specific relation, however, has been difficult because the human fossil record is sparse, and uncertainties in dating of both these fossils and climate records make correlation at the necessary resolution (within 100,000 years) problematic. To help tackle some of these issues, Joordens *et al.* examined strontium isotopes from fish fossils in sediments from Lake Turkana that also contain human fossils, focusing on an interval around 2 million years ago. Rivers feeding the lake drain rocks with different Sr isotope compositions, and thus the lake Sr chemistry varied during monsoon wet and dry periods. The record, which extends over about 150,000 years, implies that this variation primarily reflects the precession of Earth's orbit, which varies over about 21,000 years. The sediments were deposited during a well-known magnetic field reversal, allowing an accurate time-climate sequence to be constructed. The authors were able to place 12 hominid fossils into the finely calibrated sequence. Although the age span is too brief to establish a larger relation between climate change and human evolution, the approach could lead to longer records here and elsewhere. — BH



Earth Planet. Sci. Lett. **307**, 1 (2011).

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