equal ease number either in the thousands or in the tens of millions.

Natural history is still further behind. Even among the named species—never mind those still undiscovered—only a minute fraction, less than 1%, have been studied beyond the essentials of habitat preference and diagnostic anatomy. In general, ecologists and conservation biologists appear not to fully appreciate how thin the ice is on which they skate.

The full exploration of the living part of this planet will be an adventure of megascience, summoning the energy and imagination of our best minds. Its relevance to human welfare was spelled out in the Convention on Biological Diversity of the 1992 Earth Summit, and much of its methodology and possible organizational flowchart by Systematics Agenda 2000. Funding is still limited given the task at hand but is rising under the auspices of organizations such as the Global Environmental Facility and special programs of the U.S. National Science Foundation.

If conservation biology is to mature into an effective science, pure systematics must be accompanied by a massive growth of natural history. For each species, for the higher taxa to which it belongs, and for the populations it comprises, there is value in every scrap of information. Serendipity and pattern recognition are the fruit of encyclopedic knowledge gathered for its own sake. For example, all that can be learned about an endangered conifer on New Caledonia, about the rest of the conifers of New Caledonia, and about every other member of the entire world conifer flora, deserves dedicated pursuit. Periodic summaries of the information are rightfully placed into *Nature, Science, Proceedings of the National Academy of Sciences*, and other mainstream journals. Just being there, they help recruit the media to the good cause. For in order to care deeply about something important it is first necessary to know about it. So let us resume old-fashioned expeditions at a quickened pace, solicit money for permanent field stations, and expand the support of young scientists—call them "naturalists" with pride—who by inclination and the impress of early experience commit themselves to deep knowledge of particular groups of organisms.

Naturalists at heart, conservation biologists in ultimate purpose, they are in every sense of the word modern scientists. Their purview comprises systematics, ecology, and conservation biology, increasingly empowered by methodology for the accumulation and analysis of electronic databases. Their technology expands according to Moore's Law: a doubling of microchip capacity every 18 months. In 1999 a new initiative, Species 2000, set out, at last, to catalog all named species of organisms and thus provide an instantly accessible census of known global biodiversity. In 1999 the Megascience Forum of the Organization for Economic Cooperation and Development (OECD) authorized the creation of the Global Biodiversity Information Facility (GBIF), whose charge is to coordinate and bring on-line all the rapidly accumulating electronic databases for various groups of organisms. The effort will be aided by the growth of regional institutions such as the East Asian Network for Taxonomy and Biodiversity Conservation, headquartered in Seoul, and the Biodiversity Foundation for Africa, based in Bulawayo.

By 2020 or earlier the combined methodology might work as follows. Imagine an arachnologist making a first study of the spider fauna of an isolated Ecuadorian rain forest. He (or she, recognizing with admiration the powerful and growing influence of women scientists in this discipline) sits in camp sorting newly collected specimens with the aid of a portable, internally illuminated microscope. After quickly sorting the material to family or genus, he enters the electronic keys that list character states for, say, 20 characters and pulls out the most probable names for each specimen in turn. Now the arachnologist consults monographs of the families or genera available on the World Wide Web, studying the illustrations, pondering the distribution maps and natural history recorded to date. If monographs are not yet available, he calls up digitized photographs from the GBIF files of the most likely type specimens taken wherever they are—London, Vienna, Sao Paulo, anywhere photographic or electron micrographs have been made—and compares them with the fresh specimens by panning, rotating, magnifying, and pulling back again for complete views. Does this specimen belong to a new species? He records its existence (noting the exact location from his global positioning system receiver), habitat, web form, and other relevant information into the GBIF, and he states where the voucher specimens will be placed—perhaps later to become type specimens. Informatics has thus allowed the type specimens of Ecuadorian spiders in a sense to be repatriated to Ecuador, and new data on its spider fauna to be made immediately and globally available.

The arachnologist has accomplished in a few hours what previously consumed weeks or months of library and museum research. He understands that biodiversity studies advance along two orthogonal axes. First are monographs, which treat all of the species across their entire ranges, and second are local biodiversity studies, which describe in detail the species occurring in a single locality, habitat, or region. When expanded to include more and more groups, local biodiversity studies may eventually cover all local plants, animals, and microorganisms, creating an all-taxa biotic inventory (ATBI), a truly solid base for community ecology in its full complexity.

These cross-cutting databases open new avenues of useful analysis for the conservation biologist. When information on elevation, slope, vegetation cover, soil type, rainfall, and other biotic and abiotic properties of the study site are digitized, overlaid with one another, and matched