ICN
INSECT COLLECTION NEWS VOL. 2 NO. 1 1989

The following organizations contributed to this issue of the **Insect Collection News:**

American Museum of Natural History, New York; Bishop Museum, Honolulu; Cornell University, Ithaca; Council of Entomology Department Administrators; Illinois Natural History Survey, Champaign; L.A. County Museum, Los Angeles; Museum of Comparative Zoology (Harvard University), Cambridge; Pennsylvania State University; Smithsonian Institution, Washington, D.C.; Systematic Entomology Laboratory, USDA, Beltsville; Texas A&M University, College Station; Texas Tech University, Lubbock; The Nature Conservancy of Hawaii, Honolulu; University of Notre Dame.

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PLEASE SEND CONTRIBUTIONS TO

Ronald J. McGinley, Department of Entomology, NHB-105, National Museum of Natural History, Smithsonian Institution, Washington D.C. 20560, U.S.A.

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MEETING ANNOUNCEMENT

Entomology Collections Meeting In San Antonio, Texas, December 1989

Approximately 100 copies of the first issue of ICN were distributed as a handout at the International Entomology Congress in Vancouver in July 1988. An additional 100 copies were distributed at the Entomological Society of America meeting in Louisville, December 1988. In January 1989, copies were sent to the 83 collections around the world that house 1 million or more specimens. The resulting requests for the initial ICN newsletter and future issues have been overwhelming; understandably, the contributions forwarded have been few — we are all busy. Nevertheless, if we hope to effectively meet the challenges associated with insect/arachnid diversity, we will have to communicate and interact more effectively. Newsletters can help but direct communication through focused meetings are also needed.

At the Louisville meetings, Douglass Miller (Research Leader, SEL/USDA), Scott Miller (Bishop Museum), David Kavanaugh (California Academy of Sciences), Terry Erwin and Ron McGinley (Smithsonian) agreed it would be beneficial for those people in charge of, or associated with major entomological collections to meet at the next ESA National meeting in San Antonio to discuss matters of mutual concern (collection management, specimen processing networks, etc.). This meeting would parallel that regularly held by the Council of Entomology Department Administrators (CEDA; see report below), differing in that it would be concerned with details of common collection management problems. To date, those planning to convene are the above mentioned Erwin, Kavanaugh, McGinley, D. Miller, S. Miller, as well as James Carpenter (Harvard University), K.C. Kim (Penn State) and Robert Wharton (Texas A&M University). Those interested in participating should contact Ron McGinley for further details. If productive, similar meetings would be planned for future national meetings and ultimately the next International Congress in 1991.

GENERAL NEWS AND ANNOUNCEMENTS

"JUST THE FAX MA'AM"

Neal Evenhuis, Bishop Museum

Now that high technology has hit communication in the form of facsimile machines, better known as FAX machines, there has been an upsurge in the amount of time spent on the telephone transmitting digitized information (whether it be words or graphics) to colleagues. The advantages are obvious: the information is received immediately and fairly cheaply (the cost is roughly the same as a telephone call to the same number). This is especially advantageous for international interaction. One does not need to speak a foreign language to make a FAX to a foreign country. Your information or request for information is delivered on paper the same as a letter, fed through the FAX machine to the other party, and received by the other party faster than airmail or telegraph services. FAX machines are also helpful for the shy and retiring person who does not want to talk to the other party directly. Why stutter over words, when you can say more on paper, and more elegantly.

Researchers transmitting their findings or collections people disseminating urgent information to other collections people are using FAX machines more and more. With this in mind, this article can serve as an "ice breaker" of sorts by listing a few known FAX numbers. We strongly urge the readers to give us more of these numbers so we can print them here. Good com-

munication is necessary for good interaction among the scientific community. If we can expedite the communication (we have made a pretty good start from our horseback delivery beginnings), then we will greatly improve and hasten better interaction and working relationships among world scientists. If you want, you can FAX us your numbers! [Please send numbers to Neal Evenhuis, Bishop Museum or Ron McGinley, Smithsonian Institution.]

AUSTRALIA

Canberra:
Division of Ent., CSIRO — 61-62-47-0217
Adelaide:
University of Adelaide — 61-8-224-0464
Indooroopilly:
Ent. Branch, Department of Primary Industries — 61-7-870-3276
Bundoora:
La Trobe University — 61-3-479-1188
Borchardt Library, La Trobe University — 61-062-478-5814
Sydney:
The Australian Museum — 61-2-360-4350
Richmond, NSW:
Faculty of Agric., Hawesburg Agric. College — 61-045-70-1322
Nathan, Qld.:
Griffith University — 61-07-277-3759

FIJI

South Pacific Commission, Plant Protection Service — 679-384-721

NEW CALEDONIA

South Pacific Commission, Noumea — 687-26-3818

UNITED STATES

Athens, Georgia:
University of Georgia, Dept. of Ent. — 1-404-542-2279
Cambridge, Massashusetts:
Museum of Comparative Zoology — 1-617--495-0500
Champaign, Illinois:
Illinois Natural History Survey — 1-217-333-4949
Honolulu, Hawaii:
Bishop Museum — 1-808-841-8969
Lawrence, Kansas:
University of Kansas (Bio. Sciences) — 1-913-864-5321
Los Angeles, California:
Natural History Museum of L.A. County — 1-213-746-2999
Philadelphia, Pennsylvania:
Academy of Natural Sciences — 1-215-299-1170
Washington, D.C.:
Entomology Dept., Smithsonian — 1-202-357-4779
American Inst. of Biol. Sciences— 1-202-628-1509 x 262
National Academy of Sciences — 1-202-334-2854

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Entomological Systematists Directory

Al Samuelson, Bishop Museum

Development of an international directory of arthropod identification specialists as a grant-supported project has been endorsed by the Entomological Society of America at its December 1988 meeting. Guidelines for the project are being designed by the ESA Special Committee on Human Resources in Systematic Entomology, G.A. Samuelson, Chair (Bishop Museum, Honolulu) in consultation with the International Advisory Council for Biosystematic Services in Entomology, K.C. Kim, Chair (Pennsylvania State University).

The scope will cover world specialists who can provide systematics services, emphasizing the identification of insects, myriapods, mites, spiders, and allied groups. The directory will be developed from a computerized database, which can be continuously updated. If the project proceeds as planned, the specialists to be listed will be "collected" by two approaches: taxonomically and regionally. Each will have many coordinating sub-editors, who will receive authorship in the directory. This overlaid approach (by taxonomic group and region) should produce a higher degree of completeness. We are hoping to interest systematists who have already produced membership lists and directories for workers in specific taxa or regions. This project has the potential of being a large one because of the number of possible entries for the directory—possibly as many as 10,000. For further information contact Dr. G.A. Samuelson, Bishop Museum, Box 1900-A, Honolulu, Hawaii 96817 USA.

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Association of Systematics Collections Workshop on Collections Resources

Scott Miller, Bishop Museum

In October 1988, the Association of Systematics Collections (ASC) held a workshop in Washington, D.C., to discuss "Collections resources for the 1990's." It brought together 70 persons representing institutions of all sizes and types of governance for an evaluation of progress in the last 10 years, and the directions expected in the next decade. The workshop was summarized in the December 1988 issue of "ASC Newsletter" and a full report will be distributed by ASC. Preparation for the workshop included a survey of United States and Canadian systematics collections, including questions on quantity and quality of collections, staffs, budgets, and facilities over the last 10 years. A detailed summary of

the entomological collections data will be published elsewhere, but a summary of major points follows.

A total of 46 institutional entomological collections responded, reporting a total of 155 million processed specimens in 1986. Twenty seven of the collections are university collections, although only two university collections are in the largest ten. The ten largest collections house 69% of the total processed specimens (some 67 million). These ten collections loaned 412,450 specimens in 1986 (79% of the total).

Some of the most significant needs and priorities for development of United States and Canadian entomological collections are (not listed in prioritized order): Curatorial assistance, for both regular collections care and to deal with increasing problems of orphaned collections; Databasing, including basic cataloging of taxonomic names, lags far behind other disciplines; Training centers which offer both museum experience and modern systematics training are painfully few; Space and storage facilities present major problems for growing collections; Materials conservation needs require much greater attention (Hoyer's slide mounting medium is a special problem); Core funding is lacking at many collections (many university collections have less than one FTE in staff and less than $2000 in annual operating budget); Raw numbers of specimens have limited information content, while inventories such as the seven level system designed by the Smithsonian Entomology Collections Committee allow detailed tabulation of curatorial status of entire collections (forming a powerful collections and personnel management tool); and, the increasing pressures and opportunities of orphaned collections, biological diversity surveys, etc. mean that the entomological systematics community must find ways to efficiently use available resources, especially through coordination and specialization.

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Plans for Systematics Resources Management Network in Entomology (SRMNIE)

K.C. Kim (Penn State) and R.A. Hellenthal (Notre Dame)

Since the idea of the Systematics Resources Management Network in Entomology was discussed in the 1988 National Meeting of the Entomological Society of America at Louisville, Kentucky, we have received 16 institutional responses for participating in the forum for an entomological collection network: University of Arkansas, British Museum (Natural History), The Carnegie Museum of Natural History, Clemson University, Florida Department of Agriculture, Illinois Natural History Survey, Iowa State University, Michigan State University, University of Michigan, University of Minnesota, North Dakota State University, University of Notre Dame, Peabody Museum, Smithsonian Institution, Virginia Polytechnic Institute, University of Wisconsin-Madison.

We are planning to organize a meeting for SRMNIE within the next few months to define the objectives of SRMNIE, to identify the needs of diverse institutions in collection management, and to develop a grant proposal to NSF and/or other funding agencies. Please let us know your preference date for the meeting and specific items we should consider in this meeting as soon as possible. [K.C. Kim, Department of Entomology, 106 Patterson Building, The Pennsylvania State University, University Park, PA 16802]

"Notes from Underground"

Frank Howarth, Bishop Museum

Frank Howarth and Fred Stone continue their biosurveys of the terrestrial invertebrates of tropical Pacific region caves. From late December 1988 — February 1989, they will return to N. Queensland, Aust., to study cave ecology there in the first such study in the hot, wet season. Drs. Hannelore Hoch and Manfred Asche of Marburg, Germany, will join them and begin an evolutionary ecology study of the recently discovered cave Fulgoroidea (planthoppers), taking advantage of the breakthroughs in electronics to analyze the insect's substrate—borne mating calls.

Frank Howarth is also preparing a review of the environmental impacts of classical biological control introductions for the Annual Review of Entomology. Gleaning the scattered literature is difficult, and he would appreciate hearing from anyone knowing of either positive or negative effects of purposeful biocontrol introductions, especially examples of effects on nontarget systems.

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Hawaii Conservation Biology Initiative Small Grants Program

Call for Proposals

Joan Canfield and Ken Kaneshiro

Proposals are now being solicited for innovative research projects concerning Hawaiian terrestrial conservation biology. Through a MacArthur Foundation grant to The Nature Conservancy of Hawaii, $50,000-100,000 will be available in each of the next two years for this grants program. Proposed research must contribute to the mission of the Hawaii Conservation Biology Initiative: To encourage conservation-related re-

search in Hawaii in order to guide preserve design and long-term stewardship, and to disseminate this conservation expertise worldwide. This statement applies to research on native and invasive alien species, natural communities and ecosystems, and evolutionary biology that can be applied to conservation management. Proposed research should build on existing knowledge of Hawaii and be designed around well structured testable hypotheses. Collaboration between mainland and Hawaiian scientists is encouraged. For further information, contact Joan Canfield or Ken Kaneshiro, Co-Chairmen, HCHI Grants Committee, The Nature Conservancy of Hawaii, 1116 Smith Street, Suite 201, Honolulu, Hawaii 96817, (808) 537-4508.

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BIODIVERSITY NEWS

Biodiversity/Biosystematics

CEDA Report, December 1988

This document [part of a larger report] was developed through the Council of Entomology Department Administrators (CEDA) and recommends initiatives in entomological research. It is intended to present entomological research initiatives to federal and state government, to industry and business, and to other agencies and organizations for use in guiding the appropriation of research funds. This is to be a "living document", subject to periodic revision.

The biological diversity crisis has received prime attention in recent years due to the worldwide deterioration of the environment and associated extinction of many species and reduction of genetic variability of others. Extensive deforestation,population growth, and urbanization have resulted in destruction of habitats and increases of air, land and water pollution. While destruction of tropical rain forests endangers a source of great diversity, the biota in many other parts of the world in both temperate and tropical regions are also in danger. Some scientists predict a global climate change as the result of the greenhouse effect which will profoundly affect world ecology. It has been estimated that during the next century one-half of the world's species will be lost. Unprecedented international cooperation and the efforts of scientists and organizations working with a global view are required to address this imminent problem.

There are differences of opinion on how to conserve the biota of the world. Entomologists emphasize the need to conserve such insects as pollinators, parasites, predators, scavengers, and species of importance in food chains. To assess the real importance of diversity, however, we need an inventory of the biota. Unknown biota represent an undiscovered resource that await discovery and study to assess potential value. The problem of unknown biota is especially acute for entomologists because insects are so abundant and diverse, and a large percentage remain undescribed. Estimates of the number of insect species range from a million to as many as 30 million. The problem is put in perspective by the fact that only about 800,000 species have been described. Even in relatively well-studied areas, such as the United States, we have only limited knowledge about many insect groups. To collect, describe and catalog the immense insect biota would require a drastic reordering of priorities in biology. A step was taken when President Reagan signed legislation to promote international protection of biological diversity thus committing the U.S. to provide leadership in preservation of this important biological resource.

Systematics is the primary field of biology which is concerned with the study of diversity. Yet, biosystematics has been poorly supported in the past, both financially and scientifically. Present emphasis in molecular biology has detracted from the support of systematics and the study of whole organisms. However, the availability and application of the tools of molecular biology to systematics could prove an enormous benefit to developing an understanding of diversity and relationships. The problem facing biodiversity and systematics is addressed in part by Robert W. Kasten, Jr., (Committee on Appropriations, U.S. Senate) in a statement presented in **Science** (October 28, 1988):

"If we are serious about protecting biological diversity, we have to know what's out there, and in what quantity. That is why I will be introducing a bill in the U.S. Senate to provide a framework for assessing and managing the diversity of global species. Once we adopt this measure we'll be well on our way to bringing biodiversity to the top of the environmental agenda - where it belongs."

Biodiversity is a global issue; however, there are major needs to define U.S. flora and fauna. The United States is one of only a few industrialized nations that has not undertaken a national survey of its biological resources; therefore, we strongly support a national **Insects of the United States** project.

RESEARCH THRUST:

To develop a comprehensive survey of the insect fauna of the U.S., accomplish the biosystematic analysis and classification of the fauna, incorporate data into an appropriate and accessi-

ble database, and initiate conservation activity.

OBJECTIVES:

Conservation.--Identify and support conservation of areas under immediate threat of environmental destruction and those of long-term importance in maintaining biological diversity. **Survey.**--Support surveys of threatened areas and conduct the biosystematics research necessary for analysis and cataloging of their diversity. Initiate additional regional and national survey programs. **Catalog.**--Enhance efforts to catalog insect diversity by such organizations as the National Biological Survey and the International Advisory Council for Biosystematics Services. **Expertise.**--Develop an inventory of professional resources in systematics with the objective of identifying existing expertise and areas of critical shortage or future needs. **Systematics.**--Provide systematics resources at the state, regional and national levels to conduct revisionary studies essential for describing and cataloging diversity. Develop manuals and catalogs for use by non-systematists. **Education.**--Revitalize training and graduate programs in systematic entomology. **Resource Collection.**--Define and coordinate systematic resource collections to minimize duplication of specimen collection and storage and maximize use of materials through description and computer management of holdings. **International Network.**--Develop an international network to address the biodiversity crisis relative to entomology. [Initiative Subcommittee: Eldon E. Ortman, Purdue University (Chairman); Ralph E. Berry, Oregon State University; John L. Capinera, University of Florida; Fowden G. Maxwell, Texas A & M University; Thomas L. Payne, Virginia Polytechnic Institute and State University; James K. Wangberg, University of Wyoming]

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Biological Diversity in Latin America Inventory Program

BIOLAT (PROGRAMA BIOLAT) — Program Summary
Terry L. Erwin,
Smithsonian Institution

Understanding the inner-workings and balance of the natural biota in a region is fundamental to adverting potential environmental disaster.

A fresh movement among biologists in North America demonstrates some have arrived at the conclusion that major involvement by them and their scientific resources are needed in tropical countries to assist building in-country infrastructures in order to deal with the problems of environmental deterioration locally and regionally. By initially recording, monitoring, and studying species and processes related to biodiversity, the BIOLAT Program of the Smithsonian Institution began this movement, and it is growing in other institutions.

This program was defined to develop inventories of species in terrestrial ecosystems in the rich crescent of biodiversity of western and northern Amazonia from Bolivia in the south to French Guyana in the northeast. Using specially designed methodology, the main goal is to document and monitor species co-occurrence with other species at a fine resolution. BIOLAT uses an interdisciplinary team approach to inventory biota and train local peoples. An integral part of the program is the inclusion of host-country co-investigators and students in research and training. The basis of inventory is a system of permanent plots in well-protected conservation units in which all species are vouchered with museum specimens. Information about the species and their populations is computerized using specially designed software. In running the Program, attention is given to supporting the host-country infrastructure responsible for biodiversity information, particularly Natural History Museums.

While participating in the larger Program, these biologists also gain research materials for their own specific projects as well as interest national students in a scientific specialty. These biologists believe that science has no boundaries nor nationality, thus they feel that everyone, and every cultural and political system, must participate in solving the problems of deforestation, global warming, pollution, and other forms of environmental degradation, for the sake of the world.

In 1987 and 1988, expeditions were undertaken in both Peru (Manu Biosphere Reserve) and Bolivia (Beni Biosphere Reserve). A total of nearly 200 persons have been involved in these expeditions with more than 100 nationals being trained, and several thousand species have been documented in the two areas. Collections and information are shared between the Smithsonian and host-country museums.

In 1989, teams will return to both sites to further explore new habitats, search for additional species, monitor known ones, and train new students. In addition, an expedition will explore remote areas of Pacaya-Simiria National Reserve in Peru in search of a third research site and continue discussions with scientists of Ecuador to select a conservation unit for study there in the near future.

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Hawaiian Terrestrial Invertebrate Survey Workshop

Scott Miller, Bishop Museum

In November 1988, Bishop Museum hosted a workshop to develop strategic plans for basic research in support of conservation of terrestrial invertebrates (insects, related arthropods, and

land snails) in the Hawaiian Islands. Insufficient knowledge of Hawaiian invertebrates is responsible for major gaps in conservation efforts. This workshop, co-sponsored by the Museum's Departments of Entomology and Zoology, established priorities for which habitats and taxa need the most study. Habitat loss and impacts of alien organisms were seen as the primary threats to native Hawaiian invertebrates, and our studies will emphasize ways to mitigate these problems.

Insects and snails are a major component of Hawaii's ecosystems. But the over 8,000 known arthropod species and 1,000 land snails in Hawaii are very poorly understood. Good conservation requires an understanding of the current distribution and status of the organisms being conserved, as well as insight into their biology, in order to provide for their long-term needs.

Workshop participants included staff members from Bishop Museum, University of Hawaii, and The Nature Conservancy of Hawaii. Representatives from the Smithsonian Institution, Biological Survey of Canada, Field Museum of Natural History, Natural History Museum of Los Angeles County, and The Xerces Society were invited to share their knowledge of how to organize and implement faunal surveys.

The workshop was funded by the John D. and Catherine T. MacArthur Foundation. The Museum is now seeking funding to implement the plan, and facilitate protection of this vital part of Hawaii's biological diversity.

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Sorting Centers and Regional Specializations

Robert A. Wharton
Texas A&M University,
Department of Entomology
College Station, Texas
77843-2475

Mass collecting methods have made it possible for entomologists to accumulate vast amounts of unsorted material in a relatively short period of time. Most museums are being inundated with bulk samples and few have the manpower to curate them. A common response to the "biodiversity crisis" is to initiate massive collecting programs, particularly in those areas where deforestation is imminent. Since increasing funds are now being made available for these collecting efforts, the backlog of unsorted material will soon become a serious managerial problem for all museums. As the problem worsens, the entomological community cannot continue to rely on the few Masnerian curators willing and able to sort bulk samples and disperse desired taxa to appropriate systematists. Nor can we afford to store unsorted samples in perpetuity. It's expensive, and for some taxa, decidedly undesirable. NSF support through collection improvement grants has enabled several museums in the United States to stay abreast of the problem, but this is only a stop-gap measure. We need a more unified approach by the entomological community.

The U.S. National Museum of Natural History, Smithsonian Institution, is associated with a sorting center which handles vertebrates and marine invertebrates. This Oceanographic Sorting Center currently employs approximately 20 individuals. Specimens from field collections are processed, sorted to major taxa, and distributed to appropriate specialists. Similar operations for terrestrial invertebrates are clearly needed, and the NMNH is a logical place to start. A sorting center would employ 10-20 people capable of sorting bulk samples to order, suborder, and/or superfamily. With sufficient funding, sorting major families would also be possible. Sorted material would then be distributed to interested systematists throughout the world. The sorting center would thus serve as a clearing house for all our bulk samples, and insure that the material we collect is not wasted. If the pilot program at the NMNH is successful, and the success of the existing Oceanographic Sorting Center suggests that it will be, it might also be desirable to set up a few additional sorting centers in other parts of the world. Free exchange of material is the key to success. With the vast amounts of soggy specimens already accumulating in today's museums, there should be enough material for everyone.

I also think we've passed the point where even major museums can afford to house everything they collect or acquire - a point admirably addressed by Laurence Mound in the first issue of ICN. A sorting center would help us concentrate our efforts more effectively to build local expertise. For a collection with few local competitors, a region approach across taxa may be appropriate. In regions where several large collections exist, individual museums should specialize on certain taxa. A sorting center will enable each museum to capitalize on their own specialties. At the same time, they should be able to compete more effectively for federal or state funding by establishing themselves as national or international centers for taxon X or geographical region Y. This does not mean that any one museum would corner the market on , say, the world's hippoboscids. Instead, in exchange for receiving hippoboscids from collectors and museums

throughout the world, small synoptic collections of common hippoboscids could be assembled and sent to other museums for use as needed in comparative studies, instruction, etc.

These are hardly new ideas, but rather ideas whose time has come.

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Proposed Biodiversity Center for Social Insects

E. O. Wilson and James M. Carpenter, Harvard University

E. O. Wilson has approached the MacArthur Foundation with a proposal to bring social insects into the center of biodiversity and conservation studies, by making them key indicator organisms. This enterprise, to be directed by Wilson and J. M. Carpenter, is intended to mobilize efforts in the systematics of social insects in the New World tropics. It is motivated by the observation that the social insects dominate tropical forest habitats, and are also the easiest of animals to sample. They are thus superbly suited to both rapid inventories to establish hot spots and long-term ecological/conservation studies. Our goals are: (1) increase the rate of collecting, curating, and taxonomic research, especially in suspected "hot spots" of tropical America; (2) promote such activity in several of the Latin American museums most favorably situated to conduct such research; (3) target the genera best suited for rapid inventory; and (4) coordinate these efforts with the field projects already underway or planned, including BIOLAT (Smithsonian Institution), the Latin American Strategy (of the University of Kansas, Harvard, the Missouri Botanical Garden, and the Smithsonian), and the proposed national biodiversity survey of Costa Rica.

We are proposing a two-part plan. We would first hold a workshop at Harvard to which specialists in the systematics of Neotropical social insects would be invited from institutions such as Harvard, Cornell, the Smithsonian, the University of California, the L.A. County Museum, the Goeldi Museum of Belem, the Zoological Museum of the University of Sao Paulo, and the National Museum of Costa Rica. We would pool information on the status of collections at the represented institutions, the best procedures for collecting and exchange of material, division of labor in site inventories and monographs, long-range funding strategies, training programs, and so forth.

The second part of the plan would be follow-up research activities to actually begin to carry out the recommendations. We are requesting three years of support for small curatorial and research programs to start the pipeline flowing. We would employ a full-time Curatorial Associate to administer the cooperative projects and handle much of the material used in exchange. This person would be located at Harvard, which has the premier ant collection and second largest social wasp collection in the world, as well as active research programs involving monographic studies of Neotropical species in both groups. Much of the activity after the workshop would consist of arranging joint field trips by a North American and a Latin American, or two Latin Americans, once or twice a year, to critical collecting sites, combined with sharing and exchanges among the museum collections.

The support requested is $240,000 for the three-year pilot program, encompassing workshop, field trips, and curatorial activity. The Museum of Comparative Zoology would also provide $5,000 per year for the purpose of bringing systematists involved in the project for research and conference, at least half of which would be spent on Latin Americans.

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Reconstituted Entomology Collections Committee, Smithsonian Institution

Terry L. Erwin, Smithsonian Institution

The Department of Entomology at the Smithsonian Institution has a new, highly charged, Collections Committee as of January 23, 1989. Chairman Ronald J. McGinley appointed 8 members of the Department and its affiliate organizations (USDA, WRBU Mosquito Unit, and NIH Tick Unit) to the Committee with the charge of "realizing our own goals and enabling us to significantly contribute to leadership in the entomological community...our mandate at the U.S. National Museum." With these ambitions in mind he appointed the following to the Committee: Jonathan Coddington (NMNH Arachnologist), Ralph Harbach (Manager, WRBU), Gary Hevel (NMNH/Ent. Collections Manager), James Keirans (NIH), Jerry Louton (Manager, NMNH/Ent. Information Services Unit), Wayne Mathis (NMNH Dipterist), Douglass Miller (USDA/SEL Research Leader), and as Chairman, Terry Erwin (NMNH Coleopterist).

Chairman Erwin's charge to the Committee was to do what was necessary "...to accomplish a modernization of our specimen acquisition and transfer policies, specimen processing, storage and retrieval techniques, and resource networking amongst institutions...", he continued, "all of us in entomology will need to find the very best in our own systems and adopt the best from others. We shall have to discover better ways of doing things in our fun-

damental business--care and building of the Smithsonian entomological and arachnological collections. And, most vital, we will need to fully accept the fact that we are dealing with two collections: specimens AND associated data, and these are unequivocally linked."

The Committee immediately recommended the following addition to the Departmental Mission Statement: "The Department of Entomology of the National Museum of Natural History, Smithsonian Institution, and its affiliated organizations will propose a design for an international network and system for collecting, preparing, and depositing representatives of terrestrial arthropod biodiversity. This initiative will involve other organizations and individuals who wish to participate. Within one year, the organizations of the NMNH will organize their own system and dedicate their collective resources to test features essential to the international network."

Clearly, with the great efforts now underway to document Earth's rapidly disappearing biota, we in entomology will have to join forces and bring our collective global strength to face the onslaught of arthropod vouchers and general collections, to say nothing of the numerous new types which will be under our care. Entomology at the Smithsonian hopes for all readers' enthusiastic participation. What are your ideas? Write us, share with us your concerns, your better methods, your creative ideas. We want to share ours with you in future editions of ICN.

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Sorting Tropical Forest Canopy Samples

(An experimental project for networking information)

Terry L. Erwin,
Smithsonian Institution

As a first step in gathering information that can be useful in developing an inter-institutional network for processing and depositing bulk collections of terrestrial arthropods, I set up a Lotus 123 spread sheet that helps me analyze ordinal statistics, as well as the amount of time it takes for me to sort material from my fogging project. The specific project will be reported in a paper for either **Science** or **Nature** and consists of a total collection of terrestrial arthropods from the canopy of two trees in amazonian Peru. The two trees, Bombacaceae and Euphorbiaceae, formed a single isolated canopy not interdigitated with other nearby trees. In September, 1988, with a small team of helpers, I collected all material from this canopy with a forest floor footprint of 1008 square meters. The collection filled 5 pint bottles and weighted 1/2 kilogram (wet). Thus far, I have sorted (at home) 28,279 specimens to Order at a rate of 9 specimens per minute for a total of 55.4 hours of work. The main Ordinal dispersion of specimens is as follows:

Formicidae — 69.67%
19,702 specimens
Coleoptera — 9.22%
2,607 specimens
Psocoptera — 3.96%
1,120 specimens
Diptera — 2.52%
713 specimens
Collembola — 2.15%
608 specimens
spiders — 1.99%
563 specimens

All other of the 24 collected Orders at less than 2%, mostly less than 1%.

These and others are being dispersed through a network of species sorters who are also keeping time records for the ensuing steps. At the end of this exercise, we should have a good idea how an inter-institutional network might function.

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New Collections from Madagascar at NMNH

with Notes on Processing Alcohol Collections

Warren E. Steiner, Jr., Smithsonian Institution

In October-November 1988, I participated in the start of an inventory, initiated by Duke University, of the insect fauna of the proposed Ranomafana National Park in Madagascar. Several Duke and Malagasy workers and I made collections in the upper Namarona River gorge, primarily montane rain forest at an altitudinal range of 600-1,200 meters. The area, one of the few remaining large tracts of natural forest in southeastern Madagascar, was found to be uniquely diverse and rich in species. This is the site where the golden bamboo lemur, an animal the size of an average house cat, was recently discovered.

In addition to hand-collected arthropods from a wide range of microhabitats, we have large samples from Malaise, yellow and flight intercept traps, black light collections, and material taken by shaking or fogging dead leaves on treefalls. Aquatic insects are also well represented, with samples from rivers, streams, rock seepages and temporary ponds. Approximately 48,700 specimens were collected.

All of the alcohol-preserved material has been at least roughly sorted (see following examples) and the pinned specimens have been labeled and sorted. Most orders of insects are represented, and there is a

rich collection of arachnids as well. Moths are pinned but unspread at present.

Claire Kremen at Duke University is studying the butterfly fauna and ecology of the park tract. Dan Polhemus (Smithsonian Postdoctoral Fellow) is working on a monograph of aquatic Hemiptera of Madagascar, and is anxious to work on this new material. Numerous other specialists studying this region have already asked about their groups of interest.

I invite and urge any systematists interested in examining this new material to inquire. Any identifications would be most welcome; voucher specimens, when identified, are to be sent (through Duke and SI) to institutions in Madagascar. Lists of genera and species will be important contributions to the Duke project and will add to future conservation and research efforts in Madagascar.

The following is a breakdown of order/family level sorting of a Malaise trap sample (one trap, 12 days at Ranomafana, Madagascar). The Lepidoptera, large Diptera and selected other insects (roughly 600) were previously removed in the field and mounted. The "residue" of 5,549 specimens, preserved in alcohol, was later sorted in 18 hours (4 to 5 hours a day for 4 days; approximately 308 specimens/hour, 5 specimens/minute) including time for counting and labeling each vial, and contained the following:

4000	Diptera (estimated; includes a sub-sample of "priority flies")
235	Ichneumonidae and Braconidae
250	ants
210	other Hymenoptera (sorted into 2 size classses)
241	Coleoptera (sorted into 2 size classes)
242	Homoptera (2 separate lots, alcohol or dry mount)
35	Hemiptera
200	Collembola
25	Orthoptera (2 lots)
45	Psocoptera
33	Araneida
18	Acarina
15	in 7 misc. other orders
5,549	Total specimens, in 24 separate sub-lots (vials).

Likewise, a 9-day sample from flight intercept-yellow pan traps, taken late October 1988 at the same site and brought back in alcohol, took about 22 hours to sort, count and label each vial (223 specimens/hour; 4 specimens/minute):

650	Diptera, small
63	Diptera, large
1,105	Staphylinidae, 2 vials
433	Coleoptera, aquatic
698	Coleoptera, misc.
550	Coleoptera, "micros": Ptiliidae, Scydmaenidae, etc.
45	Scarabaeidae
530	Hymenoptera, small parasitic groups
21	Hymenoptera, misc. larger
25	Formicidae
52	Hemiptera
98	Homoptera (2 separate lots, alcohol or dry mount)
31	Tetrigidae
19	Orthoptera, misc.
100	Thysanoptera
190	Collembola
7	Trichoptera
7	Isoptera
4	Psocoptera
1	Strepsiptera
90	Araneida
162	Acarina
1	Chilopoda
16	Amphipoda
4,898	Total specimens in 28 separate sub-lots (vials)

This sample of small arthropods, preserved in alcohol, was hand-collected from sheets under masses of dead leaves on fallen trees that were fogged with pyrethrins, early November 1988 at Ranomafana. It was sorted in one hour (7 specimens/minute), plus another 25 minutes to count and label each vial (16 specimens/minute; bringing the total processing rate to 5 specimens/minute):

75	Coleoptera
40	Staphylinidae
1	Coleoptera larva
48	Diptera
17	Formicidae
10	Hymenoptera (parasitics)
54	Hemiptera
50	Psocoptera
11	Thysanura
10	Collembola
1	Thysanoptera
1	Dermaptera
50	Araneida
2	Acarina
5	Chilopoda
35	Isopoda
410	Total specimens in 16 separate sub-lots (vials)

One of the collections of aquatic and stream-margin arthropods taken by hand netting from a stream at the above locality, taken in a single afternoon; sorting took 25 minutes (14 specimens/minute), plus another 20 minutes to count and label each sub-lot (17 specimens/minute; bringing total processing rate to 8 specimens/minute).

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COLLECTION NEWS

National Tick Collection of the Smithsonian Institution

James E. Keirans, NIH/
Smithsonian Tick Unit

The Smithsonian Institution's National Tick Collection had its origin in the Bitterroot Valley of western Montana in the early 1900's. In the springtime, farmers would go to their fields on the west side of the valley and become ill with a mysterious measle-like disease that rapidly led to prostration and often re-

sulted in death. In 1905, Dr. Howard Taylor Ricketts showed conclusively that a tick, *Dermacentor andersoni* Stiles, was the vector of Rocky Mountain spotted fever (RMSF).

From this initial discovery, intensive investigations were undertaken on all aspects of the ecology and epidemiology of RMSF, including statewide surveys of tick species and taxonomic studies to provide methods for identifying them. During those early years, tick studies and curation of the growing tick collection were in the hands of Dr. Robert. A. Cooley (1873-1968), Chairman of the Department of Zoology and Entomology at Montana State College (now University) in Bozeman and State Entomologist of Montana. The collection was greatly increased in 1926 when Dr. Cooley traveled to South Africa to obtain hymenopterous tick parasites that had the potential of controlling *D. andersoni* in the Bitterroot Valley. On this trip, Dr. Cooley collected thousands of African ticks and began to exchange specimens with colleagues in South Africa and the United Kingdom.

During this period, ticks were implicated as vectors of several additional diseases of man and animals. Besides RMSF, ticks are involved in tularemia, tickborne relapsing fever, American Q fever, Colorado tick fever, and tick paralysis. In 1931, Dr. Cooley resigned his positions with the State of Montana and became senior entomologist at the U.S. Public Health Service's Rocky Mountain Laboratory (RML) in Hamilton, Montana. Research programs on ticks and tickborne diseases in the United States resulted in a tremendous increase in the size of the tick collection. Many ticks used in experimental studies were preserved as voucher specimens for future reference. Thus the collection assumed new importance and a second tick specialist, Glen M. Kohls (1905-1986), was added to the staff.

World War II saw the RML tick program take on a global character. Several of the scientists entered the Armed Services and served in various parts of the world, especially in Southeast Asia, and their field work added to the size and diversity of the collection. After hostilities ceased, the RML tick program retained its international flavor with cooperative research programs in Asia, Africa, Australia and Madagascar.

In the late 1950's and early '60's, Dr. Harry Hoogstraal (1915-1986) of NAMRU-3, Cairo, Egypt joined with RML in a collaborative program on ticks and tickborne diseases of the world. Because of the success of this effort, Dr. Hoogstraal began donating his tick collection to the RML, including all of his types. This resulted in the RML having the largest and most complete tick collection in the world. In 1961, Dr. Carleton M. Clifford was added to the staff as a tick systematist, and with the retirement of Dr. Kohls in 1969, the author of this article [Keirans] was transferred from the Centers for Disease Control in Savannah, Georgia, to RML as a second tick systematist.

With a shift in research emphasis at RML away from vector borne diseases to molecular research, it was decided to transfer the tick collection and the systematic staff to the Washington, D.C. area. The tick collection was officially donated to the Smithsonian Institution by the Public Health Service in 1983. Dr. Clifford retired in 1983 so only the author of this article [Keirans] transferred to Washington, but still as an employee of the Public Health Service, not as a Smithsonian employee. Subsequently, Mr. Richard Robbins, a Museum Specialist and also a Public Health Service employee, was added to the staff.

With the death of Harry Hoogstraal in 1986, the remainder of his tick collection was sent to the Smithsonian's National Tick Collection, now housed at the Museum Support Center in Suitland, Maryland. In addition to Hoogstraal's tick collection, the National Tick Collection contains the historically important tick holdings of Dr. Paul Schulze (1887-1949) and Dr. Fred C. Bishopp (1884-1970). One additional aspect of the National Tick Collection is worthy of note. Not only is this the largest and most complete tick collection in the world, but complementing it is a literature file containing virtually every published article ever written on the subject of ticks and tickborne diseases. This huge reprint collection, occupying over twenty-five filing cabinets, was also the gift of Dr. Hoogstraal and is a rich trove for the researcher delving into the history and progress in the long and seemingly endless fight against tickborne diseases.

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Current Status of Tick Lab Funding: An Update

Ronald J. McGinley, Smithsonian Institution

In February 1988, the National Institute of Allergy and Infectious Diseases (NIAID/National Institutes of Health) convened an Advisory Panel that was charged with reviewing the NIH Tick Unit and providing recommendations for future funding and directions. The final report of 3 March 1988, concluded, "It is strongly recommended that staffing of the National Tick Collection, Smithsonian Institution/National Institute of Allergy and Infectious Diseases Acarology Unit, be supported by the National Institutes of Health, particularly since this program falls within the mission of the National Institute of Allergy and Infectious Diseases, at the level of one scientist, one technician, and appropriate research support. It is understood that the

Smithsonian Institution is committed to provide continued facilities and collection management materials and equipment for this program." In early September the Smithsonian received a request for a one-year extension of the Fiscal Year 1988 Memorandum of Understanding under which NIH paid for two salaries and the Smithsonian provided facilities, collection management equipment and research/travel support. This extension was agreed to and is currently in effect. It is hoped that long-term resolution of this important Public Health issue can be achieved before August 1989 when the Federal fiscal cycle for FY 1990 gears up.

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Cornell University Insect Collection: Lepidoptera Renovation

James K. Liebherr,
Cornell University

The staff of the Cornell University Insect Collection are nearing the completion of their renovation of Lepidoptera holdings. This project was made possible by the move of the Department of Entomology and the Collection to new expanded quarters, and by funding from the National Science Foundation. The Lepidoptera are housed in approximately 3,300 drawers, representing about 28% of the 12,000 drawers of the Cornell Collection. Prior to the Lepidoptera renovation, material was arranged in 9 separate collections. Lack of drawer space and cramped working conditions in our old building prevented any extensive integration of these various collections. At present, all material has been placed in unit trays or new foam-bottomed drawers, and interpolated taxonomically. Visiting specialists have worked extensively with the Pyralidae (Eugene Munroe), Geometridae (Charles Covell), and Noctuidae (Tim McCabe).

The Cornell Lepidoptera holdings owe their strength to the personal collection of W.T.M. Forbes. His collections in North America, Puerto Rico and Mona Island, and Venezuela Laid the groundwork for our taxonomic breadth in New World holdings. Exchanges and purchases from European collectors built up an extensive synoptic collection of European material. Cornell expeditions to Africa in the 1930's resulted in strong African representation as well. Subsequent donations from a variety of private collectors have increased representation of worldwide Lepidoptera taxa.

Our holdings are known for their strength in the macrolepidoptera, with particularly good representation in the Pyralidae, Geometridae, Noctuoidea, and butterflies. After the renovation, the Pyralidae constitute 200 drawers, the Geometridae 340 drawers, and the Noctuidae over 500 drawers. Within the butterflies, representative families include the Papilionidae (over 300) drawers), Riodinidae (38 drawers), and Nymphalidae (900 drawers). The microlepidoptera constitute about 200 drawers of material, over 60 drawers of which house the Tortricidae.

Cornell maintains a type collection based on material described from our collection. Prior to the renovation, a number of Lepidoptera types had never been accessioned, and were held with material in the main collection. During the renovation project we discovered over 60 primary types, which have now been placed in our primary type collection housed in a separate type room. At present we hold primary types for 297 species of Lepidoptera, mostly derived from the works of Forbes, Fox, Heinrich, Hodges, Lindsey and Schaus.

The Cornell Collection encourages use of this material. Loans may be obtained by writing Jim Liebherr. Support for visiting scientists is available in exchange for assistance in curating our holdings.

Illinois Natural History Survey Insect Collection Remodelling

Kathryn C. McGiffen,
Insect Collections Manager

The insect collection facilities at the Illinois Natural History Survey are being remodelled. Previously, the main collection room housed most of the pinned collection and a portion of the alcohol collection. Desks occupied corners of the room, supplies were stored in and on cabinets, and a packing table and lab benches lined the walls. The most notable change will be the installation of a compact storage system, nearly doubling the space available for pinned material and holding about a third of the alcohol collection. Adjacent to the compactor will be a well-lighted counter and a desk equipped with a research quality microscope. The remainder of the space will be partitioned into three rooms, two offices and a curating/packing/storage area. Remodeling began in October 1988, and completion is expected by early April 1989. Funding for the project was provided by the State of Illinois Capital Development Board.

As might be expected, the remodelling has forced us to rearrange parts of the collection. Many drawers of pinned material have been stacked thirty-eight high and three deep and are covered with plastic. As a result, the following pinned material now is inaccessible: Coleoptera (part), Dermaptera, Diptera (except many Brachycera), Ephemeroptera, Hemiptera (except Reduviidae), Homoptera, Hymenoptera (except some bees), Lepidoptera (part), Mecoptera, Neuroptera, Odonata, Orthoptera, and Plecoptera. All holotypes and the entire alcohol collection remain available for loan or study at the Survey.

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On the Move

Mike Schauff, Systematic Entomology Lab, USDA, Beltsville

The staff of the Systematic Entomology Laboratory is split between two locations, with the bulk of the scientists in the Natural History Museum, Smithsonian Institution, in Downtown Washington, D.C., and the lab offices and a half dozen scientists in buildings 003 and 004 at the Beltsville Agricultural Research Center - West, Beltsville, Maryland. For the last couple of years, the Beltsville area has been engaged in a massive modernization project aimed at the renovation of many of the older facilities on the Beltsville reserve. This year, that project will include the complete renovation of the building (Bldg. 003) that currently houses a number of administrative offices and the offices of SEL. The laboratory is scheduled to move on a permanent basis "down the hill" to two small buildings that have been vacated by the small grains collections. This permanent move will mean that the collections (Homoptera, Thysanoptera, and mites) only need to be moved once to their new location and not back again, minimizing the possibility of damage to specimens. The renovation of 003 is scheduled to begin the first part of December, 1989, and the best guess for the move of the lab offices is late summer/early fall, 1990. For the time being, only the lab's office staff and computers will be moving. However, in the next 3 or 4 years, this will be followed by the move of the Beltsville scientists and collections from the adjoining building which is also scheduled to be renovated. However, before that move can be completed, the new facilities will be expanded and improved to provide adequate collections and office space.

In other news, the lab has been informed that new money will be forthcoming in the next fiscal year to convert a part time cooperative education grant position, occupied by M. A. Solis, to a permanent full time staff position in pyraloid moths. This new position will allow the lab to pursue an important new line of research on the adults and larvae of pyraloids and increase support to the user community for this economically important group.

Finally, we are pleased to have Dr. Amnon Friedberg of Tel Aviv University here for a year studying Fruit Flies (Diptera: Tephritidae) on an SEL sponsored fellowship. He is working with Drs. Chris Thompson and Allen Norrbom on the Fruit Fly Expert System Pilot Test Project.

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Entomology Section Wins National Science Foundation Grant

Mary Ann Dunn and Kathleen Harris
Natural History Museum of Los Angeles County

The Entomology Section of the Natural History Museum of Los Angeles County has been awarded a major grant by the National Science Foundation, Section Head Charles L. Hogue announced. Thanks to a three-year N.S.F. grant won by the Entomology Section in 1984, the organization and housing of the collection was greatly improved. The new, $271,122 award, a continuation of the previous grant, will allow the further strengthening of many important parts of the entomological collection and the improvement of the section's research facilities.

Several ongoing curatorial projects, begun under the first N.S.F. grant, will be completed over the next three years. Among these projects will be further work on the museum's extensive collections of moths and ants, already world-class scientific resources, which will be increased and improved. The grant will be used to keep pace with new additions to the collections and to ensure that the entire collection is available for scientific study.

A fascinating collection of specimens from Cocos Island, a Costa Rican national park located between mainland Central America and the Galapagos Islands, will also be prepared and made available for study. Cocos is interesting and unusual because this island habitat has more in common with the mainland than with other tropical Pacific islands. The museum's unique collection of about 25,000 specimens represents all the extant insects, myriapods, and arachnids ever collected on the island.

With the infusion of support made possible by this grant, more of the collection will receive additional attention from technicians and visiting specialists; and the section will present even more of interest and value to researchers from all over the world.

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Texas Tech University Arachnid Collections Moved

James C. Cokendolpher, Texas Tech University

The arachnid collection formerly housed at Texas Tech University has been transferred to the Texas Memorial Museum. The collection, although relatively small, contains many rare and unusual specimens from the southwestern U.S.A. and Mexico. Included are many specimens from caves in Mexico. No holotypes are present, but numerous paratypes are included.

Inquiries regarding the loan of material should be directed: Mr. James R. Reddell, Texas Memorial Museum, 2400 Trinity, The University of Texas, Austin, Texas 78705.

Renovations, Collection Improvements, and Short-Term Problems with Insect Specimen Availability at the American Museum of Natural History

Norman I. Platnick, AMNH

The entomological and arachnological collections of the American Museum of Natural History, totalling over 16 million specimens, have expanded greatly over recent years. As a result, the increased space the department gained in the early 1970's by occupying the former Roosevelt Auditorium on the Museum's fifth floor is now completely filled, with no expansion room available for additional storage cases. To solve the problem, a decision has been made to renovate the Roosevelt Auditorium to provide two levels of compactor storage that will accommodate about a thousand insect cases (more then twice the number now housed there). The renovations will be substantial, involving the removal of the original flooring and the temporary decking that was installed when the department acquired the space, and the installation of new structural beams, bridging the span between the outside walls, to bear the increased weight load.

To enable the renovations, all the cases now in that Auditorium, and in one adjoining hallway, will have to be removed. At this point, it seems likely that some of the cases may have to be stored off-site during the renovation period, and even if space is found within the Museum to temporarily house their contents, the specimens will not be accessible for normal curatorial activities during that period of up to two years.

Hence, we suggest that any systematist planning revisionary work that will required loans from our insect collection over the next three years contact the relevant curator as quickly as possible, so that decisions about what portions of the collection have to go into "dead" storage can be made with the minimal possible inconvenience to the systematic community and, wherever feasible, loans can be arranged before the renovations begin. The relevant curators are Drs. Dave Grimaldi (Diptera), Lee Herman (Coleoptera), Fred Rindge and Jim Miller (Lepidoptera), Jerry Rozen (Hymenoptera), and Toby Schuh (minor orders other than Heteroptera and Homoptera).

The compactor system that will be installed in the Auditorium is being purchased with the aid of a newly awarded NSF facilities grant to the department. In addition to the compactors, the three-year grant will provide scientific assistants, preparators, and visiting specialists to assist with the curation of the newly acquired Linnavuori collection of Hemiptera and Homoptera, with the curation of our collections of noctuoid moths, and with the establishment of a computerized database of the department's c. 21,000 primary type specimens that will serve as the basis for the publication of a type catalog.

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An Exceptional Fossil Amber Collection Acquired by the Smithsonian Institution

Donald R. Davis, SI

One of the largest collections of fossil arthropods preserved in amber from the Dominican Republic has been acquired by the Smithsonian Institution's Department of Entomology. The collection, known as the Brodzinsky/Lopez-Penha Collection, comprises over 5,000 amber samples estimated between 20 and 30 million years old. Each sample contains from 1 to over 65 specimens of arthropods representing 22 insect orders as well as several arachnids and myriapods and some plant material. [This is the abstract of a paper that will soon be published in the Ent. Soc. Washington; contact Davis or Gary Hevel for further details.--RMcG]

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CATALOG/DATABASE PROJECTS

Smithsonian Entomology Collections Information Systems

Jerry A. Louton

In the last issue of ICN I outlined the various information projects underway in the Department. Progress as well as some changes in strategy are outlined below.

Collections inventories. Work begins on our conversion from SELGEM to the INQUIRE database management system in April. The project involves outside consultants, SI Office of Information Resources Management staff, NMNH ADP staff and the Department. Our data dictionary is in "final form" and anyone wishing access to the dictionary or to our planning documents that contain the system specifications should write or phone (202) 357-1867. These will contain much useful information for those of you planning collections automation projects. We have decided to move our label-generating/species inventory system from micro's to the mainframe. That aspect of inventories is now subsumed under the INQUIRE conversion project.

Field data acquisition. Under strong advice from electrical engineers we have isolated our field lap tops from generators by charging battery packs and running computers and printers from those secondary sources. Bill Duellman (University of Kansas) reports that the new

generation of lap tops with power sensing and switching capabilities overcome this requirement. He has plugged such a machine into an inexpensive surge protector which was plugged directly into 220V generators with no apparent problems.

Hymenoptera Catalog/ Database Project. This system which was reported in the last issue of ICN was turned over to the system administrator on March 3. The system was successfully demonstrated to NMNH hymenopterists on 16 March and will undergo further testing while users are being trained in March. If all goes well the Hymenoptera Database System will be fully functional by April 1989.

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REMINDER

The next issue of ICN will be distributed in October 1989. PLEASE SEND CONTRIBUTIONS TO: McGinley, Department of Entomology, NHB-105, Smithsonian Institution, Washington, D.C. 20560, U.S.A. This effort is totally dependent on your input - the Smithsonian Institution pays the bill for processing and mailing - however, it is your collection information that will enable ICN to continue.

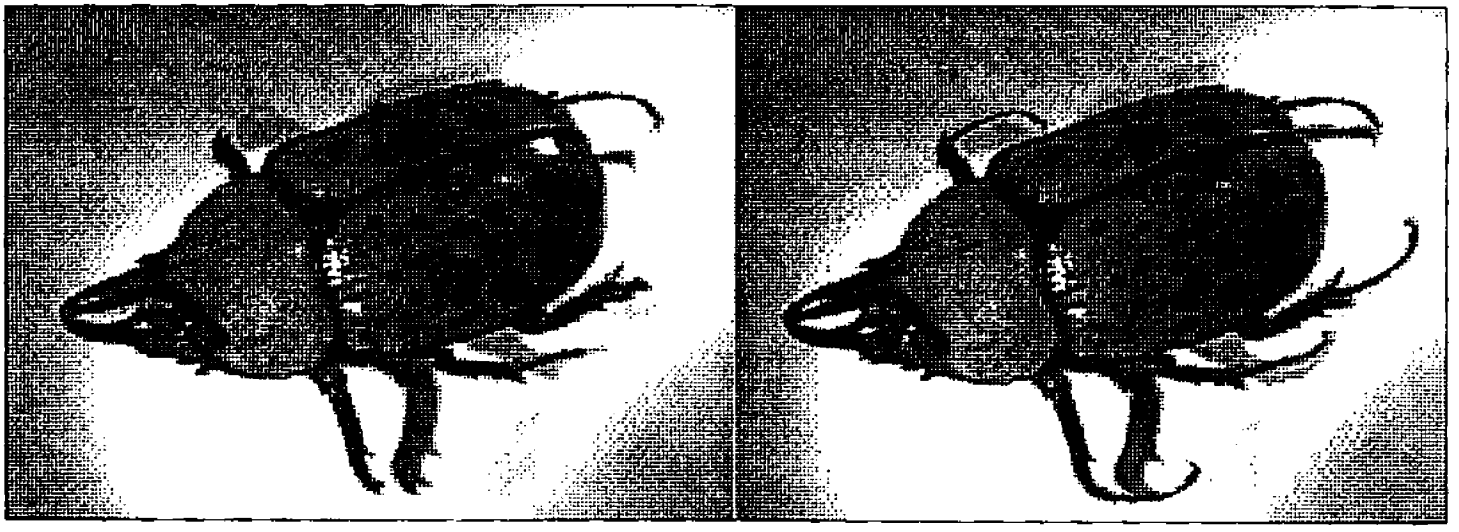

Image Technology

George L. Venable
Senior Scientific Illustrator
Dept. of Entomology
Smithsonian Institution

Imaging technology has reached the point where it must be considered and evaluated as a viable means to present scientific information in our publications. The medical community has been utilizing this technology for some time. It is now available at the desktop level. The above two figures of a common scarab beetle demonstrate at a minor level how this technology could be utilized. Using a home video camera, Sony 8mm, and a hardware/software interface called MacVision, The beetle was scanned into the computer, (Macintosh II). The file was imported into Letrasets' ImageStudio program and some of the obvious detractors; pin, and missing tarsae were retouched. While this is a very low resolution scan made even poorer in this reproduction due to the limits of the copy machine used to print this newsletter, the evidence is that this technology has a tremendous amount of potential. Currently with a high quality video camera, the same or more advanced image capture hardware and software, and the same image enhancing software, one could take for example, a series of scanning electron photomicrographs, balance the backgrounds, remove visible mounts, charging artifacts, and debris that detracts from the image. Contrast and brightness could also be adjusted. Specimen damage could be repaired if appropriate, and the plate makeup and all type, arrows, etc. could be put in place using the computer. The file would then be sent to a high resolution printer such as a Linotronic 300 for a publishable halftone negative, which could be included with the manuscript in lieu of original art. Sure beats an airbrush, rubber cement presstype and an X-acto knife!