

Degradation of Tropical Forests: A Dialogue

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Dr. Robert M. Adams
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Dear Dr. Adams:

I intrude in your institutional affairs, but I come in the cause of tropical biology, and as a concerned user of the facilities of the Department of Entomology of the U.S. National Museum (USNM) for over 30 years. I would like to plant a seed of planning that will lead in one fell swoop to a massive stoppage of what is happening to tropical insects and to the development of the most significant entomological collection in the history of the world, many times over.

My research life has been spent, and will be spent, on tropical American ecology. More specifically, I ask what do herbivores do to plants and how do plants respond. I see two things around me. First, even the most avid conservationists do not see how quickly the tropics is sliding down the crawl of human consumption; to see it clearly you have to both live in it and be an ecologist excruciatingly finely tuned to how little perturbation it takes to send an ecological interaction into delirious orbit. Second, I see a groundswell of home-grown interest in doing what needs to be done to really understand the tropics, even as it disappears. What needs to be done? Allow me an analogy. The insects of the tropics are the books in an incomprehensibly large library permeated with termites, fungi, book burners, and hoteliers desperate for floor-space on which to provide accommodations. There is only one way to obtain the funds and interest necessary to halt the library's destruction. Use it. However, this library has no card catalogue, no reference librarians, no call numbers, and no title pages in the books when you open them. Need I say more?

Entomology in the USNM has had its days of greatness and its doldrums, as do all research museums. Continuing in this vein (as are the remainder of the great entomology museums in the world), we can predict more ups and downs of the same magnitude. As such, the effort is absolutely trivial compared to what is needed. I say, without hyperbole, that the current effort is a pathetic nudge, representing only the slightest trace of the megalomaniac push that is mandatory if 1) anyone is to stop the greatest and most irreversible species annihilation this earth has ever experienced coupled with no possibility for recovery by speciation, and 2) any institution is to nurture and provide for the home-grown and exotic ferment for human appreciation and use of biological diversity that is madly racing against this annihilation. The librarians are there in the wings, more are appearing; the file cards are coming off the presses; we know how to use the personal computers and have the taxonomies to put them to work. There is still a chance. There is no institution to guide and house the library renovation and recovery. Can the combined resources of the Smithsonian Institution, USNM and USDA bring themselves to become that institution?

The unavoidable and essential mission of Smithsonian entomology is the thorough taxonomic discovery and organization of the entire insect fauna of the New World. This mission is already in a very close race with human avarice. While the United States is the fountainhead of organized health in the Western Hemisphere, it is a pitiful second cousin to this hemisphere's insect fauna. There are more species of insects within a 20 mile radius of my house in Costa Rica than in the entire eastern United States. It is simply ludicrous for political rationale to act as though one can understand the insect fauna of the United States, ecologically or taxonomically, in the absence of (or in the extinction of) the remainder of the insects of the Western Hemisphere. The boll weevil costs US agriculture more dollars than any other crop pest in the country; it is a tropical insect following a tropical crop plant. It is clear to me, as a person relying daily on the names of tropical insects, that the taxonomy of extra-tropical insects will remain

in chaos until it is thoroughly integrated with the much larger body of insect species, genera and higher groups that populate the tropics. How can you hope to understand two species of *Encospilus* wasps that parasitize numerous species of large moths in the eastern United States until you understand at least the taxonomy of the hundreds of species of *Encospilus* that live south of the United States-Mexican border?

What will it take to realize this mission? First, a change in attitude, a change that currently bubbles frustratedly in the traditional container of entomology at the Smithsonian. Second, a plan of deliberate rapid growth, aimed at the realization that the insect processing plant, the library in its full functional glory, demands a physical volume at least 100 times that in your insect collections. That you may not view this as hyperbole, let me just mention that your taxonomists are currently rejoicing in the news that 215,000 insect drawers are currently ordered and on the way. My "Moths of Costa Rica" project, funded by NSF and fueled by rapidly growing local support, will fill that many drawers alone in 4 years.

Specifically, what would the growth need?

Immediately, a large floorspace, perhaps double that currently in use, with accompanying office space whereby the resident taxonomists are all housed with the collection and with large sorting and curating table space (are you aware that your taxonomists work under conditions whereby yesterday I came within a millimeter of stepping in the middle of 50-year-old specimens and a taxonomist's back as I came around a corner, where he was working spread out on the floor because there simply was no sorting space?).

Immediately, a doubling of the cabinet capacity for incoming collections; at this very moment I sit at the junction of whether to initiate the instruction of a seminal insect collecting operation in El Salvador, home grown, that would easily swamp all available USNM receiving facilities, at no cost other than the insect pins, boxes and labels.

Soon, a substantial and carefully orchestrated growth in the staff of professional research taxonomists; the pitiful resources of the British Museum (Natural History) have

stepped forward and adopted the responsibility of the Hymenoptera of Santa Rosa National Park, Costa Rica—they will be the clearing house and primary taxonomists for a collection that will number literally 100's of thousands of Costa Rican wasps and bees in the next 5 to 10 years. The sibling facility of the USNM was not able to provide determinations and organization for more than three species of parasitic Hymenoptera in the past 3 years.

Soon, a deliberate growth in the production and maintenance of on-site non-Ph.D. insect identifiers and preparators, paramedics to the world's agriculture and medical entomology; they must have space within the collection.

Soon, an explicit effort to draw in and on the widespread taxonomic expertise that exists all over this world, to enlist their aid in setting the great chaos in order; in whose

lap would you presently put such people even if they rejuvenated their faith, if they changed their image of the USNM as a place so understaffed and overpacked that material collected and curated as much as 60 years ago is still sitting in its original place in the drawer, if even it was ever sorted and taxonomically entered in the collection? I mean, like, who wants to pour their resources into an attic?

Soon, a statement to the World that there is an institution standing ready to truly take on this monumental task, to stand up and tell us what is there, who it is, what we know about it to date, and where it is. When you, Mr. new graduate student in the Chamela biological station of western Mexico, recognize the interest and the volunteer labor to collect and organize the insects of Chamela, the Smithsonian New World insect collection must stand ready

to absorb these insects, guide them to their place in the system, and later regurgitate a portion of them as a determined reference collection for Chamela and the Instituto de Biología, Universidad Nacional Autónoma de México. When you, Mr. avocado grower in south Texas, scream at Beltsville that a weevil is drilling your avocados, the system is there to tie that problem to what I know about wild avocado weevils and their parasites in Costa Rica, to tie it to the names of the 60 other wild avocado weevils found throughout the Neotropics, and to tie it to all that we already know about seed-killing weevils the world around.

Soon, a merger of the resources of Smithsonian (USNM) entomology and USDA identification resources and staff into a cohesive single administrative unit with a goal in common: taxonomically understand and provide literature access to the insects of

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the New World from Canada to Argentina. And let me add that given the habitat destruction currently rampant, and the movements of people and products, today's wild beast in Argentina will be Iowa's pest of tomorrow. It's called fire ants, corn borers and gypsy moths.

Do the conditions exist for the germination of such a megalomaniac mission? You have the people and the collection. And you have a lot of people standing in the wings who would help with all they have, were the nod to be given. I am only one of many. Would Neotropical nationalism allow such a global effort? Undoubtedly, given that the planners and realizers understand that the benefits have to flow throughout the system in the form of reference collections returned to national museums, support for local collectors and taxonomists, and unbiased insect identification

for all, regardless of state, politics or plant. What would it cost? A lot, but nothing compared with what is going to be lost if it is not done, both in agricultural economics and in cultural deprivation of humanity when it extinguishes at least $\frac{9}{10}$ ths of the species of insects extant in the Western Hemisphere. And note that it is being done without then producing the circumstances for the kinds of adaptive radiations that must have replaced the earth's insect faunas after the great natural extinctions.

Either do it well or don't bother. Five years from now is too late.

Sincerely yours,
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Dear Dr. Janzen:

Thank you for your thoughtful and provocative letter of October 18th concerning the rapid and global degradation of tropical forests. You will find some reflection of my own concern for this problem in my column in the December *Smithsonian Magazine*. I also appreciate your suggestions as to how we could deal with what all would agree is an immense, multifaceted challenge. Our biological scientists at the Smithsonian, entomologists in particular, are likewise deeply concerned over the massive annihilation that is taking place, and they are ready to participate in whatever broad response can be devised to the irre-

placeable destruction. The issues of concern are indeed immediate, and if there is to be an adequate response to them it must reflect that urgency.

Yet it is also the case that suggestions concerning space, personnel, and other resources are very difficult to implement rapidly. Being new to the Secretaryship of the Smithsonian, I will naturally need to discuss these issues further with biologists at the National Museum of Natural History and others concerned. And only then can the lengthy efforts begin to secure the supplementary financial and other resources that will certainly be required.

Some of your suggestions concerning space are perhaps least worrisome, since to some extent they are now being solved by our new Museum Support Center. This facility was designed chiefly to house collections from the Museum of Natural History, with storage expansion to be added in increments as needed and as resources are available. Be assured that space planned for that expansion, for Entomology in particular, will be maintained and developed for that purpose.

Space for the storage of collections is, of course, just a partial response to the overall needs you have outlined. There is also an obvious need for additional staff and better logistical support. Such requests, unfortunately, require time to develop, as we educate, solicit, and hopefully gain the support of the Congress. This is particularly true now, as budgets are being pared and priorities are re-examined.

What I miss in your letter is a vision of the effort that you and your colleagues in your own and other universities are prepared to make, matching the massive undertaking that you map out for the Smithsonian. Our resources, while large, are necessarily constrained to be devoted to multiple ends. Shifts in priorities are inevitably slow in any institution such as ours that is built around vast collections. New staff appointments, in these times, will inevitably be rare and contested among many departments. There is probably nothing that would be as effective in obtaining the response you seek, not only within the Smithsonian but with the Congress, as clear evidence that the entomologists of this country shared your perception of this

crisis and were taking steps of their own to contribute to its solution. I do hope to hear further from you if such a development occurs. In any case, I do appreciate—and largely share—your concerns and will make every effort to deal with the problem you have outlined.

Sincerely,
Robert McC. Adams
Secretary

Secretary Adams asks for "clear evidence that the entomologists of this country share my perception of this crisis." I ask you to give me a pile of letters 2 meters deep sharing my perception of this crisis. If you simply agree, drop me a note saying so. If you wish to elaborate, please do so, but be sure that a concise summary judgement is also included. If you disagree, please also write.

Secretary Adams also asks for evidence that the entomologists of this country are taking steps of their own to contribute to a solution. By writing to me as indicated above, you are taking a first step. Second, cataloging the insect resources of the New World requires more than a repository and its curation; it requires that the field collectors and taxonomists throughout the New World generate a massive collecting and taxonomic effort. It is my opinion that the existence of a massive processing operation at the USNM would kindle the collection and taxonomic spirit of all of you out there. If I am wrong, tell me so in the letter that you write. Third, it is my opinion that a massive collecting, curation and tax-

onomic effort centered on the USNM would represent a legitimization of this vital area of biology, a legitimization that would be contagious for policy decisions about support for taxonomy and museum facilities in other relevant institutions. Again, if I am wrong, tell me so. Fourth, and finally, it is my perception that the young people who will grow into the next generation of taxonomic expertise are standing out there, eager to take part, but abandon the cause owing to a well-founded cynicism that current fashion will neither support them directly nor support the institutions in which they must be imbedded. If the taxonomic offices of the wealthiest and best-educated nation on earth cannot rise to the cause of reversing that fashion, we will truly be deserving of the contempt to our grandchildren.

In closing I should comment on the sentence in my letter that appears to restrict this effort to the New World. My reasoning is strictly pragmatic. If called on the carpet, I feel competent to defend most aspects of Neotropical conservation efforts, but lack detailed comprehension of many crucial aspects of Paleotropical conservation problems. Second, I believe in progress by example. If we can set our house in order, we show that it *can* be done and we will surely be in a position to offer our experience as requested in the Old World tropics. Finally, taxonomy knows no boundaries in biology, but while I can visualize an encompassing effort for the Neotropics, I can also see that same effort becoming hopelessly diluted if it takes on the world in one bite. ■