

# ISCE NEWSLETTER

Vol. 6, No. 2, May, 1989

## International Society of Chemical Ecology

### President's Message

A shocking figure that concerns us all is the estimated loss of 20,000 species from the face of the earth each year! As these species vanish, we suffer not only a *biological* but also a *chemical* deprivation. What future avermectins, cyclosporins, or pyrethrins are we losing before they can be discovered?

In spite of the rapid growth of sophistication in molecular modelling and drug design, many of our most valuable pharmaceuticals, as well as agrichemicals, are still based on naturally occurring "secondary metabolites." Clearly, these natural regulators, often unique to a single species, represent a reserve of chemical information of potentially immense significance and utility from a human viewpoint. As chemical ecologists, we have a direct interest not only in the preservation of biological diversity, but also in the unravelling of chemical interactions which play important ecological roles. A related endeavor which represents an opportunity that we should not ignore is the search for useful biological activities among naturally occurring compounds. From such "chemical prospecting" we can reasonably expect to discover the next generation of

antibiotics, anti-parasitic agents, insect feeding deterrents, etc.

Since the rate of species loss is highest in the tropics, it is in the tropical regions where some form of action is most urgently needed. The **International Society of Chemical Ecology** may well be the uniquely appropriate organization to provide leadership for a chemical prospecting effort. There are many problems to be faced, not the least of which is that of making biological/chemical conservation economically feasible, or better still, attractive, for the countries in which it is to be carried out. Ideally, the search for new compounds might be pursued in a collaborative style, involving an imaginative combination of academic, governmental, and industrial participation. The return of a significant fraction of any economic rewards to the country from which useful natural products originate, for the purpose of encouraging conservation, would be a crucial element in the undertaking.

Professor Thomas Eisner has recently addressed these themes in considerable detail.\* He will develop these ideas further in his opening talk at our Sixth Annual Meeting in Gothenburg this August. We plan to organize a discussion of this subject toward the end of the program. It

may be possible to formulate an explicit series of steps which could lead to the establishment of a model chemical prospecting effort, to be coupled with a tropical conservation program.

For our Gothenburg meeting, Professor Gunnar Bergström has planned a rich program, impressive both in its depth and breadth, which we can all anticipate with pleasure. If we can make progress toward the implementation of a joint chemical prospecting/biological conservation program while we are together in Sweden, our next meeting will attain special significance!

*Jerrold Meinwald*

\*Eisner, T. "Chemical Prospecting: A Proposal for Action," in *Ecology, Economics and Ethics: The Broken Circle*. F.H. Bormann and S.R. Kellert, eds. Yale University Press, New Haven, Spring, 1990.

### From the Editor

This issue is chock-full of information regarding important Society issues. There are two proposed amendments which are being put before the membership in this issue. The first involves a change in the ISCE fiscal year and the second involves a change in the ISCE Statement of Purpose. Voting on each of these proposals will take place at the annual meeting in Gothenburg. If you feel strongly about either of these proposals and will be unable to attend the Gothenburg meeting, please let me know and I will report your views. We are also asking you to vote for officers for the positions of Vice President/President-Elect and Treasurer. The names of the candidates listed have been submitted by the nominating committee. There are still some members who are dissatisfied with the election procedure. The issue will be reexamined at the executive/council meeting in Gothenburg. Finally, we expect to have a new directory for members by August. Enclosed with this newsletter is a slip of paper containing the information about you that is in the directory. We are trying to ensure maximum accuracy in the directory. Please check the entry and return it only if there is an error that you have corrected or additions that you have made. I hope to see many of you in Sweden.

*Nancy M. Targett*

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## Evolutionary Aspects of Chemical Ecology Major Theme of Sixth ISCE Meeting in Gothenburg

The Nordic School of Public Health at the University of Gothenburg, Sweden is the site for the Sixth Annual ISCE meeting to be held from August 7-11, 1989. A major theme of the meeting is Evolutionary Aspects of Chemical Ecology. Our meeting host, Dr. Gunnar Bergström, has arranged a stimulating scientific program, consisting of invited presentations, minisymposia, and contributed presentations.

The contributed oral and poster presentations have been organized under the following topics:

1. Chemical ecology of microorganisms
2. Chemical ecology of plants
3. Chemical ecology of aquatic organisms
4. Chemical ecology of invertebrates
5. Chemical ecology of vertebrates
6. Biological methods/techniques in chemical ecology
7. Chemical methods/techniques in chemical ecology

Invited speakers for the meeting are:

May Berenbaum, University of Illinois: "Chemical ecology of *Papilionidae*: A Swallowtail tale."

Jürgen Boeckh, Regensburg University: "Receptor and neuronal mechanisms of encoding and identification of natural odors."

Lena Brattsten, Rutgers University: "Metabolism of plant allelochemicals in insects."

John Coll, James Cook University of North Queensland: "Chemically mediated interactions between marine organisms."

Thomas Eisner, Cornell University: "The insect as druggist—the utilization of plant secondary metabolites by insects."

Douglas Futuyma, State University of New York, Stony Brook: "Ecological chemistry in evolutionary focus: What are the questions?"

Jeffrey Harborne, Reading University: "Interactions of insects with plant flavonoids."

Joe Lewis, USDA, Tifton, Georgia: "Roles and functional mechanisms of semiochemicals in the tritrophic interaction of plants, phytophages and parasitoids."

Lynn Margulis, University of Massachusetts: "Reconstructing the chemical ecology of earliest life."

Yoko Naya, Suntory Institute for BioOrganic Research: "Chemicals involved in symbiotic relationships:

## Gothenburg Meeting

A tentative schedule for the Gothenburg meeting is as follows:

|                                     |  |                          |  |
|-------------------------------------|--|--------------------------|--|
| <b>Monday</b>                       |  | <b>Tuesday Evening</b>   |  |
| 12:00 noon                          | ISCE registration begins at the Nordic School of Public Health | 6:00 p                   | Dinner and boat excursion to archipelago   |
| 2:00 p                              | ISCE Executive Meeting   | <b>Wednesday Evening</b> |  |
| 4:00 p                              | ISCE Executive and Council Meeting                             | 5:30 p                   | Society Business Meeting   |
| 6:00 p                              | Dinner   | 6:30 p                   | Dinner   |
| 8:00 p                              | Welcome reception  | 8:00 p                   | Plenary Lecture by Dr. Douglas Futuyma   |
| <b>Tuesday – Thursday (Daytime)</b> |  | <b>Thursday Evening</b>  |  |
| 7:30–8:15 a                         | Breakfast  | 6:00 p                   | Cocktails  |
| 8:25–10:30 a                        | Invited speakers/Minisymposia                                  | 6:30 p                   | Musical performance by Professors Thomas Eisner, Bo Malmström and Jerrold Meinwald |
| 10:30–11:00 a                       | Coffee Break   |                          | Society Banquet  |
| 11:00–12:30 p                       | Invited speakers/Minisymposia/Poster Session (Wednesday)       | 7:30 p                   |  |
| 12:30–2:00 p                        | Lunch  | <b>Friday</b>            |  |
| 2:00–3:30 p                         | Contributed papers   | 7:30–8:15 a              | Breakfast  |
| 3:30–4:00 p                         | Coffee Break   | 8:25–10:30 a             | Invited speakers/Minisymposia  |
| 4:00–5:30 p                         | Invited speakers/Minisymposia                                  | 10:30–11:00 a            | Coffee Break   |
|                                     |  | 11:00–12:00 p            | Invited speakers   |
|                                     |  | 12:00–12:30 p            | Meeting summary  |
|                                     |  | 12:30–2:00 p             | Lunch  |

*Sea anemone–fish and insects–microorganisms.*"

Nancy Targett, University of Delaware, "Allelochemical cues in the marine environment."

There will be six minisymposia. Their titles, organizers, and participants are listed below.

"Evolution of mate recognition systems,"

Wendell Roelofs. Participants: D. Lambert, C. Löfstedt, L. Phelan, W. Roelofs, L. Tompkins.

"Behavior mechanisms in chemical communication," Thomas Baker, Charles Linn. Participants: T. Baker, K. Döving, C. Linn, M. Sabelis.

"Evolution of chemical communication systems in forest insects," Wittko Francke. Participants: O. Anderbrandt, G. Lanier, C. Sanders, F. Schlyter, D. Wood.

"Multifunctionality of chemical signals," Manfred Kaib. Participants: J. Billen, M. Blum, M. Kaib, H. Mustaparta.

"Identification and synthesis of new semiochemicals," Kenji Mori. Participants: H. Arn, T. Chuman, H. Hauptmann, K. Mori, A. C. Oehlschlager, J. Pickett.

"Olfactory receptor morphology," Erik Hallberg. Participants: E. Hallberg, M. Menco, R. A. Steinbrecht.

## Information for Participants

**Poster Presentations.** Participants presenting posters will have an area 70 cm x 100 cm for display. Posters should be left up for the entire meeting. The official poster session is scheduled for Wednesday from 11:00 a–12:30 p. Authors are asked to be with their posters during this time.

**Oral Presentations.** Participants giving oral presentations will have 15 minutes in which to present their work. This will be followed by a 3 minute discussion period. A 35 mm slide projector and an overhead projector will be available in the room. If you have any other requirements, please contact Dr. Bergström.

**Registration and Accommodations.** The total cost of participation, which is a package price, will be 4,000 SEK = Swedish crowns (ca \$666 U.S.) for regular members and 3,000 SEK (ca \$500 U.S.) for student members. For regular non-members there is an additional fee of 300 SEK (ca \$50 U.S.). For student non-members the additional fee will be 120 SEK (ca \$20 U.S.). These sums include full board (room, food, refreshments) from Monday afternoon through Friday lunch; the reception, boat excursion, banquet, and registration fee. It is possible to stay over Friday night after the meeting at the school (no food will be provided). This will cost 200 SEK for one person, 300 SEK if there is an extra bed in the room.

An alternative is the nearby Novotel Hotel, which is offering a reduced rate for meeting participants. The hotel is a 15 minute walk from the meeting site. Daily car service to and from the Nordic School of Public Health will also be provided. A single room will cost ca 450 SEK (200 SEK more per night than at the school) and a double room will cost ca 550 SEK (300 SEK more per night than at the school. If the 90 rooms at the school fill up the overflow will be booked in the hotel. Costs for staying at the hotel should be paid directly to the hotel. Information can be obtained by writing or calling Novotel Hotel, Klippan 1, S-41451 Gothenburg, Sweden. Telephone: 46-31-149000; Fax Number: 46-31-422232.

Registration forms and abstracts should have been submitted by 1 June. For exceptions to this deadline contact Dr. Gunnar Bergström, Department of Chemical Ecology, University of Gothenburg, Box 33031, S-40033 Gothenburg, Sweden.

Anyone who must cancel their registration after payment of fees will be refunded the paid amount minus the registration fee (600 SEK or ca \$100 U.S.).

## Information about Gothenburg

**Travel to Gothenburg.** Gothenburg can be reached by air, train, ferry and car. Many transatlantic and continental flights go via Copenhagen, but are also available directly from London, Amsterdam, Frankfurt, Stockholm, etc. Ferries arrive from England, Amsterdam and Kiel (overnight). Train service from the continent or from within Sweden (Stockholm, Oslo etc.) is very good. There are several trains per day going through Hamburg and then via Copenhagen. One can also go from Hamburg to Fredrikshavn by train and then by ferry (3 hrs) to Gothenburg. Those who choose to come from the continent by car can use the same two alternatives or other ferries to Sweden. Please note that August is tourist season and that transportation often has to be booked well in advance.

The Nordic School of Public Health is located at the Göta Älv (the main river flowing through Gothenburg), west of the city center. The closest public transportation is by tram to station "Nya Varvet." The road from there will be marked by signs.

**Weather in Gothenburg.** August is summertime in Scandinavia. Temperatures are typically 20-26°C (68-77°F), but can reach 30°C (86°F) on very hot days. The day is quite long, sunrise is at 5:30 a and sunset at 9:00 p. We expect sunny weather, however, it is advisable to always be prepared with a light overcoat in the event of a cool, rainy day.

**Gothenburg and Vicinity.** The area around Gothenburg is varied and of clear biological interest. To the north, there is a rocky coastline. To the south the coast is composed of more sandy beaches. In both habitats there is interesting flora and fauna. To the east there is a partly hilly countryside. To the west lies the archipelago.

**Pre- and Post-Meeting Tours and Social Program.** There are no special pre- or post-meeting tours planned, nor are there any special programs for accompanying individuals who are not participating in the meeting. However, we will be pleased to sug-

gest places of interest to anyone who would like to tour Gothenburg and its vicinities.

## Proposed Amendment to the Statement of Purpose

As prescribed in our Society bylaws, a proposed amendment to the constitution must be presented to the membership 60 days prior to a vote. The following amendment proposed by Clive G. Jones and Jeremy McNeil will be put before the membership for vote at the Society business meeting in Gothenburg.

- continued on page 4 -

### ISCE Statement of Purpose: Results from the Straw Poll

A total of 100 ballots were returned (a most convenient number allowing instant conversion to percentages!) from a total of 400 sent out to members. This return (25%) is average to good by most polling standards. Table 1 summarizes the results of the straw poll.

A large majority of respondents preferred the Statement of Purpose designated A1 (Table 1). A number of comments or editorial suggestions were made by respondents for each of the statements. Comments on A1 were mostly informational or minor editorial suggestions that would not alter the meaning. A few people questioned whether the definition of ecology that includes the term "environmental" excluded biotic interactions—clearly not the case since the definition of ecology is "interaction of organisms with their environment." Their environment includes the biotic and abiotic. Most comments on A2 had to do with the choice of the words "interdisciplinary," "multidisciplinary," or "collaborative." There was no clear consensus in alternative versions (A3), although a number of respondents suggested combining A1 and A2 in various ways.

A very large majority of respondents approved of the draft statement on areas of research (Table 1). There were a number of comments suggesting additional areas that could be included, and concern over how to phrase applications of chemical ecology to social needs. Most of those expressing disapproval inferred from their comments that they would approve if modifications to the statement addressed these two problems.

In conclusion, it would appear that the majority of respondents approve the following new Statement of Purpose: The ISCE promotes the understanding of interactions between organisms and their environment that are mediated by naturally occurring chemicals; and an Areas of Research Statement based on: Research areas include the study of structure, function, and biosynthesis of natural products, their importance at all levels of ecological organization, their evolutionary origin, and their application to social needs. Consequently, resolutions have been submitted by Clive Jones and Jeremy McNeil proposing that the ISCE now adopt the Statement of Purpose designated A1 in Table 1 and restated in italic on the next page and a slightly modified Areas of Research Statement (which addresses concerns expressed in the straw poll) as part of its bylaws.

Clive G. Jones

Table 1.  
Results of the ISCE Straw Poll on Statement of Purpose and Areas of Research

#### A. Statement of Purpose

A1. *The ISCE promotes understanding of interactions between organisms and their environment that are mediated by naturally occurring chemicals.*

Approve: 68

A2. *The ISCE promotes interdisciplinary (or multidisciplinary) collaborative research on ecological interactions mediated by naturally occurring chemicals.*

Approve: 19

A3. *Neither of the above.*

Alternative version: 13

#### B. Areas of Research

*Research areas include the study of structure, function, and biosynthesis of natural products, their importance at all levels of ecological organization, their evolutionary origin and their application to social needs.*

Approve: 89 Disapprove: 7 No vote: 4

- continued from page 3 -

It is proposed that the ISCE change its Statement of Purpose from:

*"The International Society of Chemical Ecology is devoted to promoting an understanding of the origin, function, and significance of naturally occurring chemicals that mediate interactions within and between organisms." to:*

*"The International Society of Chemical Ecology promotes the understanding of interactions between organisms and their environment that are mediated by naturally occurring chemicals."*

It is further proposed that the ISCE append the following statement on areas of research to its Statement of Purpose:

*"Research areas include the chemistry, biochemistry, and function of natural products, their importance at all levels of ecological organization, their evolutionary origin, and their practical application."*

### Proposed Amendment for Change of Fiscal Year

Our annual meeting is, by far, the major financial operation of the Society each year. It has been difficult, and sometimes impossible, to complete all the financial transactions relative to the meeting by the end of the fiscal year under our current scheme of 1 September - 31 August because the meetings come relatively late in that fiscal year. This makes the accounting procedure more complex. Even though we pay no taxes the Society still must file a very complicated Internal Revenue Service form with the U.S. government in which details of expenditures and income must be given. It is much easier to file that form on a calendar year basis. Hence the following proposal to change the Society fiscal year to match a calendar year.

In addition, I believe that it will help our members to know when to pay dues if we operate on a calendar year basis. Presently, most members pay dues in the late fall - early winter. Furthermore, Plenum Publishing Corporation publishes the *Journal of Chemical Ecology*, to which many of our members subscribe, on a calendar year basis.

Therefore, I wish to propose that the bylaws of the ISCE be amended at the annual meeting in Gothenburg Sweden. I propose that Article VIII, Section 1 of the bylaws be changed from:

*"The fiscal year of the Society shall be from September 1 to August 31." to:*

*"The fiscal year of the Society shall be from 1 January to 31 December."*

James L. Nation, Treasurer

Dr. Nancy M. Targett, Editor  
ISCE Newsletter  
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**PROFILE :****David S. Seigler**  
**Candidate for Vice President/President-Elect**

David S. Seigler is presently a Professor and Head of the Department of Plant Biology at the University of Illinois in Urbana where he has been since 1970. Dr. Seigler's principal research interest is the role of

plant secondary compounds in biological interactions. Areas of particular concern include: Cyanogenesis in plants, study of *Acacia* species of the subgenus *Acacia*, and the role of plant secondary compounds in the diets of primates.

Dr. Seigler has had a long-term interest in cyanogenic compounds from plants. He and his students and collaborators have isolated and characterized a number of new cyanogenic lipids and glycosides. Other studies have elucidated the probable biosynthetic origin of several of these compounds and studied their involvement in plant-insect interaction.

Studies of cyanogenesis in the genus *Acacia* with Dr. Eric Conn, University of California, Davis, soon led to the realization that relationships within this group of woody legumes were not well understood. In order to clear up some of the problems encountered, Dr. Seigler, Eric Conn, Bruce Maslin and others began investigation of representative species of this genus. The structures and biosynthetic precursors of cyanogenic glycosides have proven valuable in understanding subgeneric relationships within the group. With Dr. John Ebin-

ger and David Clarke, he also undertook an in depth study of species of *Acacia* cyanogens and tannins of several species. The presence of cyanogenic glycosides and tannins in several species of ant acacias suggests that the prevalent theory that ant-protected plants do not need chemical defenses is not general.

In collaborative work with Drs. Ken Glander and Pat Wright of Duke University, Dr. Seigler has pursued studies of the role of plant secondary compounds in the diet of primates. Howling monkeys in Costa Rica can tolerate large quantities of tannins and saponins in the diet, but not most other types of secondary compounds. In work in Madagascar, it was found that the golden lemur consumes a diet rich in cyanide, proportionately more than 300 times the amount needed to kill humans per day.

David Seigler's background in rural Texas and his frequent early exposure to plants and animals led to his interest in studies of biological interactions. He obtained his doctorate in organic chemistry at the University of Oklahoma and later did postdoctoral study at the Northern Regional Laboratory, U.S. Department of agriculture, Peoria, Illinois and in the Department of Botany, University of Texas, Austin, with Dr. Tom Mabry.

Dr. Seigler is the author or coauthor of about 100 papers and the editor of two books dealing with phytochemistry, chemical ecology, and systematics. He is a member of several biological and chemical societies. His research has been supported by the National Science Foundation, Earthwatch, and the National Geographic Society.

**PROFILE :****James L. Nation**  
**Candidate for Treasurer**

James L. Nation is presently a Professor of Entomology and Nematology at the University of Florida, Gainesville where he has been since 1960. His research interests have included the physiology and biochemistry of

insect excretion, nutrition, and more recently pheromones, particularly of the tephritid fruit flies and *Dendroctonus* sp. of bark beetles. His research has been supported by the National Science Foundation, U.S. Forest Service, Environmental Protection Agency, U.S. Department of Agriculture, and Florida Department of Citrus.

Dr. Nation was born and raised in Mississippi, graduating from Mississippi State College (now University) with a B.S. in entomology. His graduate studies were undertaken at Cornell University in entomology with a specialization in insect physiology and biochemistry. He and his wife, Dorothy, have three children. Dr. Nation has been a member of ISCE since its inception and currently holds the office of treasurer.



**INTERNATIONAL SOCIETY OF CHEMICAL ECOLOGY**  
**1989 BALLOT**

Please register your vote by marking the boxes and returning the ballot by 1 July 1989 to Dr. Nancy M. Targett, University of Delaware, College of Marine Studies, Lewes, Delaware 19958, U.S.A.

**Vice President/President-Elect**

- David S. Seigler  
 Other \_\_\_\_\_

**Treasurer**

- James L. Nation  
 Other \_\_\_\_\_