Publications of the Entomological Society of America: A Descriptive Study of Patterns of Use

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THE ENTOMOLOGICAL SOCIETY OF AMERICA (ESA) originated in 1953 from the merger of two national entomological organizations: the American Association of Economic Entomologists, established in 1889, and the Entomological Society of America, established in 1906. In 1910 these two societies together had only 411 members, but by 1950, 2,629 members were represented. The ESA now has nearly 9,000 members (ESA Bulletin 1986), representing a diversity of backgrounds, interests, and opinions on scientific and political topics.

The objectives of the ESA, as stated in Articles II and X of its constitution, are "to promote the science of entomology in all its subdisciplines for the advancement of science and benefit of the society, and to ensure cooperation in all measures tending to that end" and to "publish periodicals and other publications which are appropriate to the Society's interest" (ESA Bulletin 1980). Two journals, aimed at increasing and diffusing knowledge of insects, were initiated in 1908. Today ESA continues to publish those original journals—the *Annals of the Entomological Society of America* (ANN) and the *Journal of Economic Entomology* (JEE).

Initially, these journals disseminated primary scientific knowledge. However, in the more than 75 years since the first ESA periodical was published, the science of entomology and the number and kind of entomological articles that are published have changed dramatically. Technological advancements, increased pesticide use, and the integrated pest management (IPM) concept, for example, have altered the subject matter published by ESA journals and increased the level of interdisciplinary research. In addition, because scientists today are evaluated—for employment, promotion, and tenure—at least in part upon their publication record, entomologists face increased pressure to publish more. Consequently, the journals provide an important service to members publishing research. They also represent a major contribution to the science of entomology.

To accommodate changes in an evolving profession, the society has periodically revised its goals, scope, and aim. Changes in the society's publications have accompanied some of these revisions. In 1965, when ESA journals began to reflect increased research funding and activity, a committee was appointed to propose future publication requirements. Issues of JEE were approaching the size limits set by binding, and inadequate publishing space for members could result within a few years. Changes proposed by the committee included reducing the number of manuscripts approved for publication, editing in a more ruthless fashion, printing the journals monthly instead of quarterly, limiting the number of times any one author could publish in a single year, and printing additional publications (Bulletin ESA 1966, 1970). As a result of these suggestions, a third journal, *Environmental Entomology* (EE), was added in 1972 to relieve pressure on the other journals.

In 1973 and 1974 a number of additional changes, both in policy and personnel, resulted in a new goal: improvement of ESA journal quality. Changes in editorial personnel took place in all three journals. New editors were appointed to ANN and EE; the JEE staff was reduced from two editors to one; and a new managing editor was hired. From 1972 to 1974 the rejection rate increased from 10 to 31% for ANN, from 7 to 47% for JEE, and from 1 to 28% for EE (Bulletin ESA 1973b, 1975). Despite an all-time high in the number of manuscripts submitted, the actual number of printed pages decreased in 1973. The new managing editor reminded the society that this decrease ought to be viewed as an improvement of the journals and of the entomology profession because the editors had made a strong effort to improve quality, and as a result, rejection rates had gone up (Bulletin ESA 1973c).

In these transitional years, changes also took place in society finances. In 1962, the ESA president asked whether the society should provide outlets for all publishable material submitted by its members despite growing financial constraints (Bulletin ESA 1962). The Governing Board agreed and recommended page charges so that the sponsors of research could share with the society the publishing costs. In 1963, charges of $20 per page were initiated. This charge did not decrease the number of articles published, but the average number of pages published decreased slightly (Bulletin ESA 1965). The managing editor suggested that authors were not necessarily discouraged by page charges but were presenting their findings more succinctly. However, by 1972 the page charge had increased to $30 per page, despite objections by many members, and the society subsidized 69% of the publication costs (Bulletin ESA 1972). At the same time, journal subscriptions were separated from membership dues in an effort to make ESA publications more self-supporting (Bulletin ESA 1971).

Page charges were subsequently increased further to compensate for income lost because fewer manuscripts were being accepted, and a new policy on page charges was established. Page charges were to be based on 80% of printing and mailing costs (Bulletin ESA 1973a). In 1975, the 80% rule was changed to the 85% rule. Page charges increased from $30 in 1972 to $66 in 1977. In 1978 the Governing Board recommended a new policy of assessing page charges to cover 100% of the costs for each journal (Bulletin ESA

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1978), but this policy was not implemented. Page charges remained at $66 until 1985 when they were reduced to $46.

Other proposed publication changes also have been the subject of considerable debate in recent years. In 1979, because member subscriptions were declining, a committee was formed to evaluate society publications. The committee decided that the three journals were poorly differentiated and overlapped in their coverage (ESA Newsletter 1982a). To alleviate the problem, an umbrella publication, the *Journal of the Entomological Society of America*, with six specialty subjournals loosely linked to the ESA section subject areas, was proposed. This revised journal structure was to give the society more visibility by incorporating its name into each journal title, and to offer members a wider variety of specialty journals. In the future, subjournals could be added or discontinued as needed. Advantages and disadvantages of this proposed change have been discussed at length in ESA publications (e.g., ESA Newsletter 1982b, 1983a, 1983b; Bulletin ESA 1983) and at meetings. The entire ESA membership was given the opportunity to vote by mail ballot on this proposed change in early 1984. The two-thirds majority vote required for this constitutional change was not obtained, and the society today continues to publish the three established journals. Recently, the society purchased an additional journal, the *Journal of Medical Entomology* (JME). Nevertheless, numerous alternatives to the current publishing format are still being debated among society members.

Clearly, any change in journal format could affect many ESA members. The goal of our study was to evaluate the patterns of use of ESA journal publications by analysing the attributes of contributing authors over the transitional years described above (1960–1985). Specific questions addressed are as follows:

- Is there a correspondence between the size of the ESA membership and the number of articles published?
- What percentage of the membership publishes in ESA journals?
- Do the publications serve all ESA sections and branches equally?
- What proportion of journal contributions come from university, government, and state employees?
- Has the proportion of multiauthor papers increased?
- What percentage of the society subscribes to the ESA journals?
- Are changes in ESA publication policies associated with measurable changes in publication patterns?

We evaluated the patterns emerging from these analyses to determine how effectively the journals have served the ESA membership and to provide some objective information that can be used to improve future ESA publications.

Materials and Methods

Data Collection. The primary sources of data were articles published in the *Journal of Economic Entomology* (JEE), *Annals of the Entomological Society of America* (ANN), and *Environmental Entomology* (EE). We also used society membership lists published biennially from 1960 to 1985. Yearly membership counts for each section, classification, and branch were obtained from unpublished records at the ESA national headquarters and from published annual business reports.

ESA Sections

Section A: Systematics, morphology, and evolution
Section B: Physiology, biochemistry, and toxicology
Section C: Ecology, behavior, and bionomics
Section D: Medical and veterinary entomology
Section E: Extension and regulatory entomology
Section F: Crop protection entomology

Each of the three ESA journals publishes six issues every year. All of the articles in the three journals from 1960 to 1985, including Scientific Notes and Forum papers, were evaluated. Attributes for each contributing author were identified by using membership lists and by extracting information from article footnotes. A maximum of six authors was recorded for each article. Authorship order was also recorded (Table 1). Variables associated with contributing authors were

- Name: last name plus the first and middle initials;
- ESA membership classification: active, student, emeritus, honorary, life, nonmember, or student nonmember;
- ESA section affiliation (subject area): A, B, C, D, E, or F;
- Branch: Pacific, Eastern, North Central, Southeast, Southwest, or Foreign; and
- Employer: university, government, state (county), private, or cooperative (between two agencies).

Variables associated with the published articles were volume and issue number, the number of pages, and the number of authors.

To maintain consistency during data collection, several specific procedures were followed:

- Geographic location, employer, and ESA division of an author while the specific research was being conducted were used for branch, employer, and membership designations. For example, if an author published an article based on research completed for a graduate degree one year earlier, the author was recorded as a student member, employed by a university in the appropriate branch.
- Article page lengths were recorded as whole numbers. The minimum length for an article was one page.
- ESA section affiliation for an article was determined by the section of the senior author. If the senior author was a nonmember or a member who had not declared a section, the next author with a designated section affiliation was used. Articles published by nonmember authors were assigned a section based on subject matter in the abstract and title of the article.

To evaluate the subscription patterns, data on the total number of members subscribing to each journal were collected (Bulletin ESA

Table 1. ESA journal publications, 1960–1985

	No. of authors	No. of articles
Annals of the Entomological Society of America	10,103	5,431
Environmental Entomology	8,177	3,371
Journal of Economic Entomology	23,818	10,356
Total	42,098	19,158

1979, 1985). To identify alternative entomology periodicals available to ESA members for publication, cumulative counts of entomology-related journals initiated each year from 1967 to 1984 were tabulated. We included periodicals published in journal format in the United States and Canada that are still in print (Standard Periodical Directory 1985, Ulrich's 1985, Irregular Serials and Annuals 1985).

Data Analysis. Data were stored and processed on an AMDAHL 470-V8/IBM370 OS computer. Before analysis began, the data were sorted into three subsets. Author and article counts for each journal were then sorted and cataloged into yearly summaries by subset, based on the questions stated in the objectives of the study. Information obtained from the summaries for each data subset was graphically displayed in relation to time and as cumulative totals for each journal.

To describe the total publishing use of the journals by all contributors, the first data subset included all ESA members, nonmembers, and repeat authors publishing in the three journals. The proportion of interdisciplinary articles was calculated from this data subset. Interdisciplinary contributions were defined as those articles that included two or more authors from different ESA branches, ESA sections, or employers. Information from data subset 1 was displayed as the total number of authors publishing, the total number of articles published, and the percentages of the authors and articles on a yearly basis.

To evaluate use of the journals by ESA members, the second subset consisted only of contributing authors who were ESA members. The proportion of members who published from each branch, section, and classification for each year was calculated to obtain a percentage of the ESA membership publishing. Bias introduced by repeat authors was avoided by counting each author only once in a single year. Percentages were calculated on a yearly basis and a weighted average was taken for cumulative totals over the 26-year period. The percentage of the publishing membership that contributed to the journals more than once a year (repeat authors) was calculated separately.

The third data subset determined how many ESA members published in society journals over the entire 26-year period (1960–1985). As in the second data subset, only ESA members were included. Repeat authors were counted only once throughout the entire 26-year period. The percentage of repeat authorship (authors who published more than one article in the 26 years) was again calculated separately.

Results and Discussion

We examined a total of 19,158 articles published in the three ESA journals by 42,098 authors over 26 years (Table 1). About 54% of the articles were published in JEE, 28% in ANN, and 18% in EE. The large number of authors included repeat authors as well as multiple authors of single articles. Of the 42,098 authors, 32,127 (76%) were ESA members, and 9,971 (23%) were nonmembers. Of the contributing ESA members, 88% had declared a section affiliation. These records provided a solid framework for evaluating publication patterns in ESA journals.

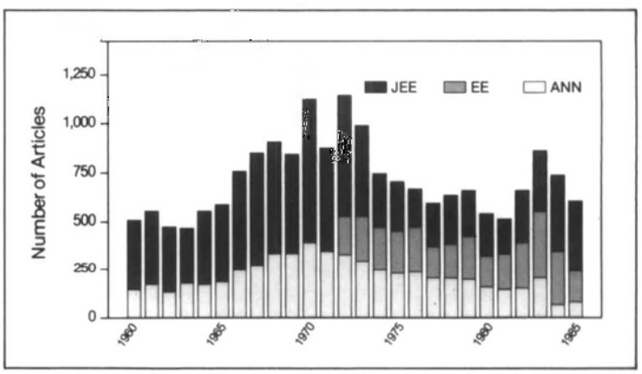

Fig. 1. *Number of articles published in each journal.* (*JEE*, Journal of Economic Entomology; *ANN*, Annals of the Entomological Society of America; *EE*, Environmental Entomology). *Based on data subset 1.*

ESA Membership and Number of Articles Published. From 1960 until the early 1970s, a direct and consistent relationship existed between the increasing number of articles published (by all contributors, including nonmembers) in JEE and ANN (Fig. 1), and the increasing number of ESA members (Fig. 2). The annual percentage of nonmember authors publishing in ESA journals also increased rapidly during this period. Between 1972 and 1974, however, there was a 56% drop in the number of articles published in JEE and a 36% drop in ANN. Since then, although the membership has continued to grow, the number of articles published each year and the percentage of the ESA membership publishing have decreased. Despite a continuing increase in membership growth from 1974 to 1977, the percentage of membership publishing each year continued to drop (Fig. 2).

Membership Publishing. During 1972, the most active year of the period studied, only 20% of the membership contributed to ESA journals. At one point (1981), only 9% of the membership published

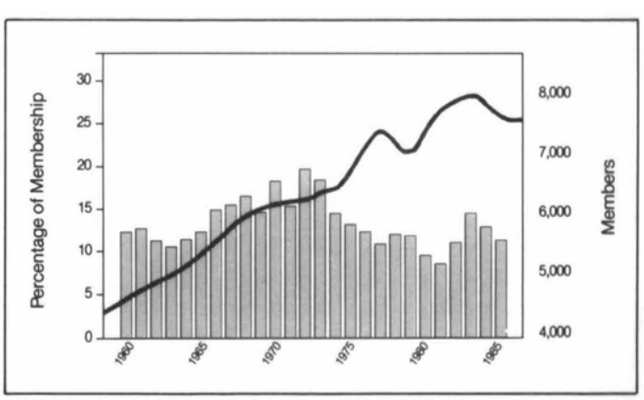

Fig. 2. *Growth of ESA membership from 1960 to 1985 and the percentage of ESA membership publishing in the three ESA journals combined. Based on data subset 2.*

in the three journals in a single year (Fig. 2). A larger proportion of society members was involved in technical review of ESA manuscripts. In 1980, for example, only 10% of the membership published, whereas 38% were involved in reviewing manuscripts for ESA publications (ESA Newsletter 1980).

The initial decrease in the number of articles published and the percentage of the membership publishing was most noticeable in 1973 (Fig. 1), when the standards of all three journals were raised and rejection rates increased. Eventually it was expected the number of papers would increase as new authors turned to the improved (and presumably more prestigious) ESA journals and as past authors submitted better articles, but the number of articles published each year continued to decrease and rejection rates remained consistently high. The number of submissions remained low as well, a reflection perhaps of the increasing number of alternative outlets available for entomological publications. The number of other entomology-related journals available to ESA members (several with no page charges) has increased consistently since the early 1960s.

Changes in editorial personnel also occurred in 1972 when EE was initiated. Subscriptions to all of the journals were separated from membership dues, and from 1972 until 1987, subscription costs had to be paid for above and beyond membership dues. One would have expected that the availability of a new ESA journal would have given members an increase in outlets for their research results and would have increased the percentage of the membership publishing in ESA journals. Although the number of authors publishing in EE continued to grow after its initiation, the number in JEE and ANN decreased, resulting in fewer members publishing. The fact that this expected change did not occur suggests that other factors undermined the positive effects of a new journal. The initiation of an additional ESA publication in 1976, *Insecticide and Acaracide Tests*, also may have affected the number of publications in JEE during this period.

Decreases in publications from 1977 to 1981 can be explained in part by editorial changes. In 1978, EE acquired a new editor, and a new managing editor for all the journals was hired in 1980. EE experienced a 20% drop in the number of authors publishing in 1980 (Fig. 7), but the number then increased until 1983 as did the number of authors publishing in JEE. Also during these years, the ESA headquarters was experimenting with inhouse typesetting and other printing methods. As with all experimentation, errors occurred that could have contributed to the drop in articles published. The increase in published articles in the two subsquent years, as the backlog of unpublished manuscripts was reduced, may have been another result.

A measure of the overall number of ESA members who have used the three ESA journals (on a yearly basis) to disseminate their research findings is reflected in Fig. 3. For the 26-year study period, an average of 14.1% of the membership published at least one article each year. Repeat authorship accounted for an additional 5% of the contributions, or nearly one-quarter of all yearly journal contributions by ESA members.

A similar trend is shown in analyses based on the third data subset, which represents the percentage membership publishing

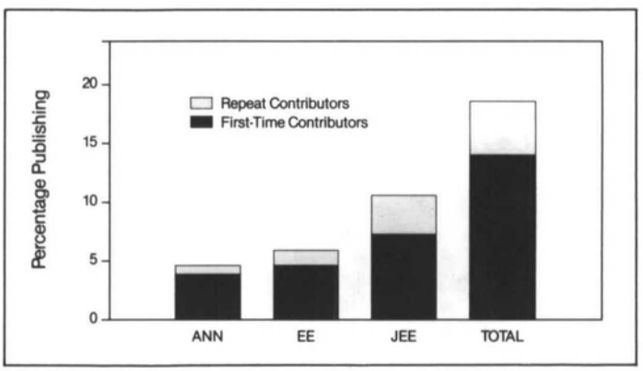

Fig. 3. *Percentage of the ESA membership publishing one or more articles per year, within each journal.* EE *is proportioned to the last 14 years (1972) of the study. First-time contributors include the percentage of the membership publishing at least one article in a single year. Repeat contributors are the percentage of the membership publishing more than one article in a single year. Based on data subsets 1 and 2.*

over the entire 26-year study period. Actually, a very small percentage of ESA members accounts for the great majority of authors in ESA journals. Only 8,927 ESA members were involved in the more than 42,000 contributions to the ESA journals over the past 26 years. In other words, the majority of the member contributions (72%) were made by members who had already published at least once. Most (84%) of the members who did publish made between one and five contributions in the 26 years, and only a few members published a large number of articles. The greatest number of contributions by a single member over the 26 years was 73. Student

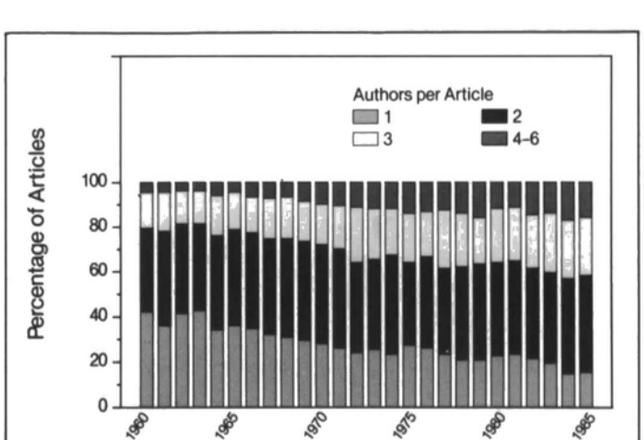

Fig. 4. *Percentage of single and multiauthor articles published each year in all of the journals combined. Articles by one, two, or three authors are listed separately, and articles by four, five, or six authors are combined. Based on data subset 1.*

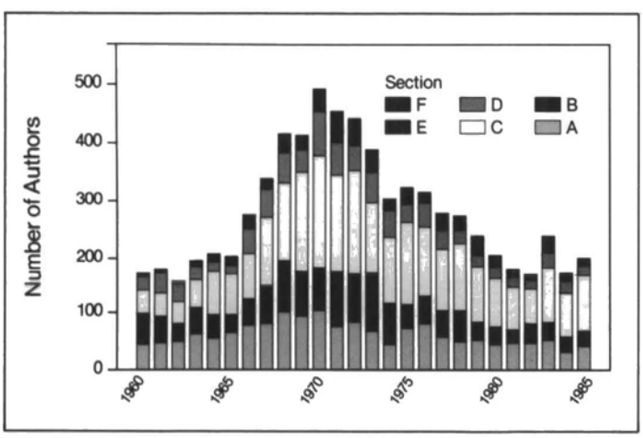

Fig. 5. *Total number of authors by ESA section publishing in* ANN. *Based on data subset 1.*

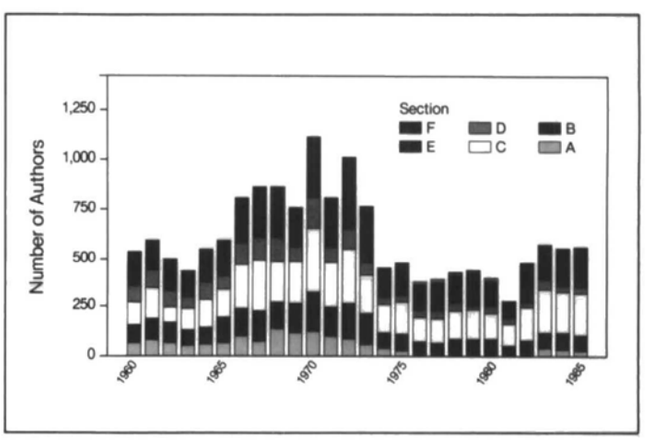

Fig. 6. *Total number of authors by ESA section publishing in* JEE. *Based on data subset 1.*

members represented 25% of the total member authors, and 32% of these students remained in the society and published at a later date as active members.

Authorship of Articles. Our hypothesis was that the number of scientists cooperating on a single research endeavor, and therefore the number of multiauthor articles, would have increased in the past 25 years. Our study supports this hypothesis. In the three ESA journals, the number of single-author articles decreased more than 50% since 1960, resulting in a proportionately greater number of articles with three or more authors (Fig. 4). This increase in multiauthor articles coincides with an increase in interdisciplinary research endeavors. The percentage of articles published by two or more authors from different employers, branches, or sections increased in both JEE and ANN over the 26 years. Averages indicate that contributions to EE (18%) are the most interdisciplinary in all three respects; those to ANN (12%) are least interdisciplinary. However, since 1960 ANN has had the greatest increase in interdisciplinary contributions.

Size of Articles. The average number of pages per article in all ESA journals combined remained relatively constant between 1960 and 1980, but increased from 4.4 to 5.3 (about 17%) after 1980. The average for the 26-year period in all three journals is 4.1. Articles in ANN were consistently longer (average = 5.3) than in the other two journals (JEE = 3.3, EE = 4.7). Although JEE had the fewest pages per article, the largest number of articles was published in that journal (Table 2, Fig. 1). In ANN, as the number of pages per article increased, the number of articles published in that journal decreased.

Publication by Section and Branch. Each ESA member can choose to join one of six subject matter sections of the society. Some of the sections are defined by the insects studied; others are defined by the type of work done. This results in some degree of subject

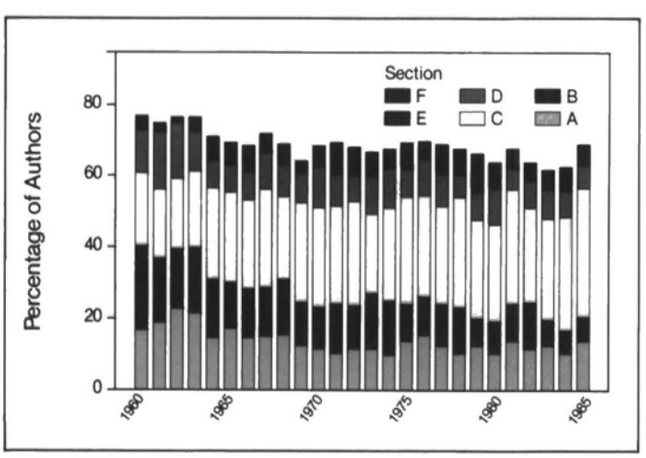

Fig. 5a. *Percentage of authors by ESA section publishing per year in* ANN. *Based on data subset 1.*

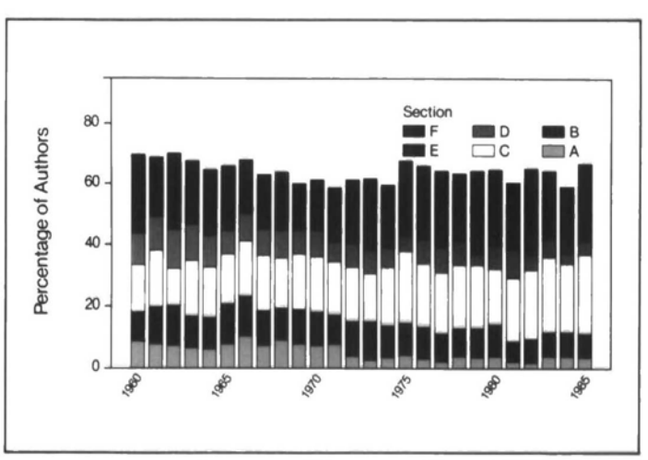

Fig. 6a. *Percentage of authors by ESA section publishing per year in* JEE. *Based on data subset 1.*

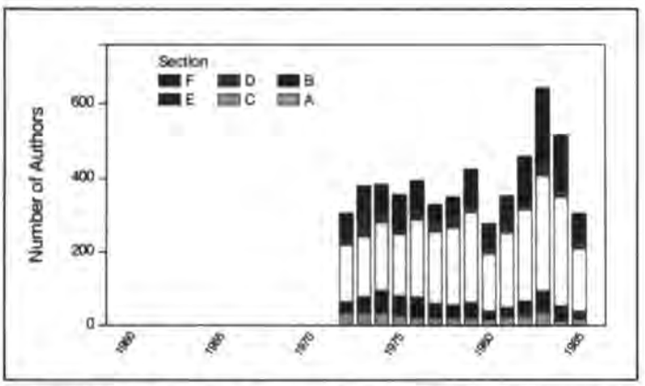

Fig. 7. *Total number of authors by ESA section publishing in* EE. *Based on data subset 1.*

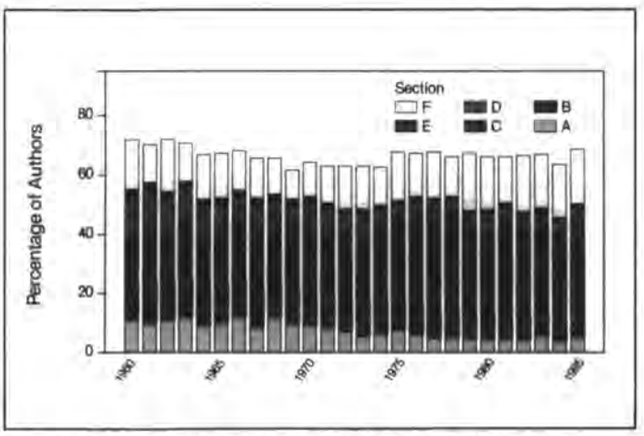

Fig. 8. *Percentage of authors by ESA section publishing per year in all ESA journals combined. Based on data subset 1.*

overlap. The present journals, which are organized on a broader level—the basic, economic, and environmental aspects of entomology—seem to accommodate this overlap. Members from each section published in each journal (Figs. 5–7), and the number of authors from different sections working together has increased in all three journals.

In ANN, the percentage of authors from sections B and D has decreased the most since 1960 (Figs. 5, 5a). Sections C and F, which are the largest ESA sections, have increased contributions to ANN from 1960 to 1985. Section D subject matter was published most in ANN. Contributions to JEE from section C have increased over the 26 years. Section A contributions to that journal have decreased since 1972 when EE was introduced (Figs. 6, 6a). In EE, section C contributed the most articles, but contributions from other sections have remained relatively constant in contrast to the fluctuations in section contributions in the other two journals (Figs. 7, 7a).

Each journal has a particular focus that can accomodate several sections. Although authors from each section published to some extent in each journal, this study shows that one or two sections publish more frequently in a particular journal. For example, sections C and A contributed the greatest proportion of articles to ANN (Fig. 5a). Most contributions to EE are from section C (Fig. 7a), whereas authors from sections C and F contributed primarily to JEE (Fig. 6a).

When all three journals and all of the contributors were examined, the subject matter of sections C and F appeared most often (Fig. 8). However, when ESA members alone were considered, authors from sections C and B constituted the largest percentage of ESA members contributing to the three journals (Fig. 9). This suggests that nonmembers and members without section designations are contributing more articles representative of section F subject matter.

Clearly, all of the sections were not represented equally. Although it was the smallest section, section B proportionately contributed

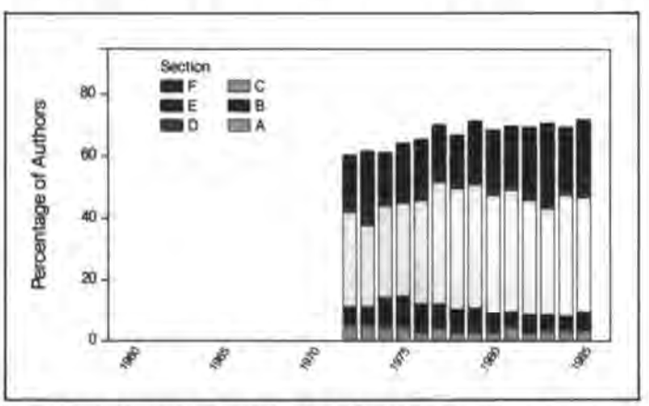

Fig. 7a. *Percentage of authors by ESA section publishing per year in* EE. *Based on data subset 1.*

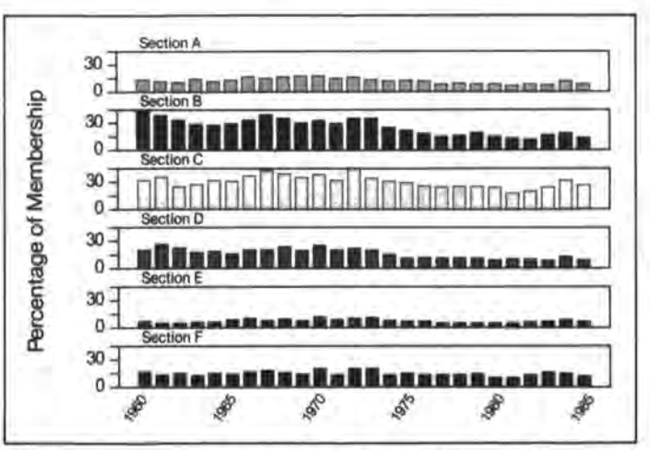

Fig. 9. *Percentage of ESA section members publishing at least once a year in ESA journals. Number of members in each section publishing in proportion to total members in each section. Based on data subset 2.*

the greatest amount (45%) to ESA journals in 1960 (Fig. 9). Over the 26 years, however, this section has had the greatest change, a decrease to 13% of its membership publishing. All of the sections have experienced at least a slight decrease in the proportion of members publishing in the journals, especially since the early 1970s. Members in section E proportionately published the least. Perhaps this is because extension and regulatory entomologists usually are not involved in the production of primary scientific knowledge and therefore publish in technical bulletins or other outlets.

Section C seems to take the most advantage of the current ESA journals. This section is the largest in the society. Because its subject area covers a variety of topics, section C articles are appropriate for all three journals. Contributions from section C increased throughout the study period, and in 1985, they represented the majority of authors.

The Pacific and Southeast Branches, with the largest membership, represented the largest number of authors publishing over the 26 years (Fig. 10). The Southwest Branch, the smallest geographically and with the fewest members, consistently published the fewest articles (except for the foreign members). However, the Southwest Branch members proportionately contributed the most to ESA publications. An average of 18.6% of the Southwest Branch members published in the journals. In contrast, the Eastern Branch, one of the largest, averaged only 11.4% actively publishing members over the 26 years.

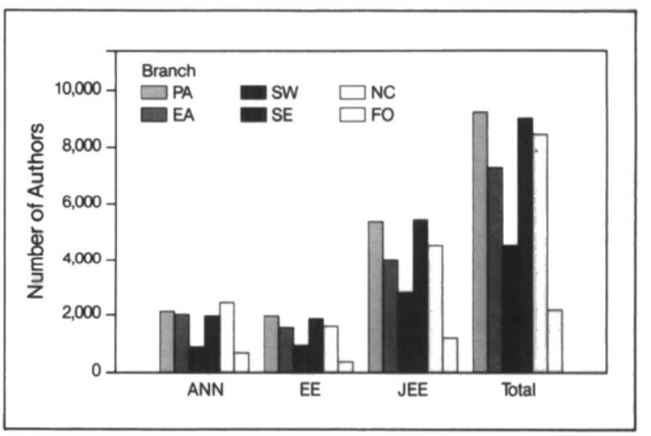

Fig. 10. *Total number of authors by ESA geographic branch, for each journal.* PA, *Pacific;* EA, *Eastern;* SW, *Southwestern;* SE, *Southeastern;* NC, *North Central;* FO, *Foreign. Based on data subset 1.*

Employer Affiliation. Entomologists employed by universities contributed the most articles (51%) overall to ESA journals from 1960 to 1986; government employees were responsible for 40%, state employees contributed 6%, and private and cooperative agencies published the remaining 3% (Fig. 11). The majority of submissions from section D were contributed by government employees, whereas all of the other sections were represented most by university employees. Although employees from each agency contributed to each journal, university employees were responsible for the most contributions to ANN and EE. Government employees

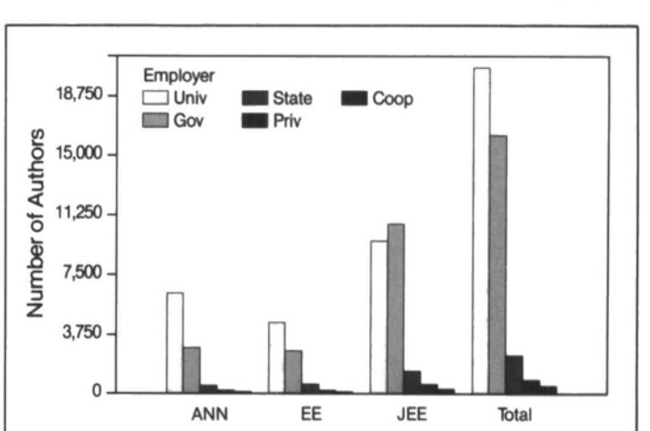

Fig. 11. *Total number of authors by employer, for each journal. UNIV, university; GOV, government; STATE, state (county); PRIV, private; COOP, cooperative between two agencies. Based on data subset 1.*

Application for Membership

ENTOMOLOGICAL SOCIETY OF AMERICA

It shall be the purpose of this society to promote the science of entomology in all its subdisciplines, for the advancement of science and the benefit of society, and to assure cooperation in all measures tending to that end. The Entomological Society of America is a not-for-profit organization entertaining applications from all qualified individuals without reference to race, religion, creed, or sex.

Any person engaged in work in entomology or allied fields, or who has suitable training or interest in entomology, may become a member by vote of the Governing Board, after a completed application, accompanied by the required fee, has been filed with the Executive Director of the Entomological Society of America. Membership is on a calendar year basis. Dues of new members who are accepted after November 1 shall be applied to the following year. Termination of membership can be effected by written notice, or when being dropped for cause, by letter from the National Office.

Date: _____

Please print or type

Name _____
LAST FIRST MIDDLE

Address _____

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Telephone Number ( ) _____
(Area Code)

Have you been a member previously? _____ If so, when? _____

Section (indicate one letter)

- ☐ A. Systematics, Morphology, and Evolution
- ☐ B. Physiology, Biochemistry, and Toxicology
- ☐ C. Ecology, Behavior, and Bionomics
- ☐ D. Medical and Veterinary Entomology
- ☐ E. Extension and Regulatory Entomology
- ☐ F. Crop Protection Entomology

Membership Dues / Subscriptions

ANNUAL DUES: $60 U.S. ($65 outside U.S.)

For accounting purposes, $12 is allocated to Member Services and $8 to the ESA Newsletter. The remaining $40 may be allocated toward ESA publications of your choice at the special membership rates. **If you wish to receive any publications, indicate your choices below with an X in the ☐.**

		Postage outside U.S. (Add on line 6 below)		**Optional** Airmail—countries other than India (add on line 6 below)
Journal of Economic Entomology	$25 ☐	$5 ☐	India—$20 ☐	$40 ☐
Environmental Entomology	$25 ☐	$5 ☐	India—$20 ☐	$40 ☐
Annals of the ESA	$25 ☐	$5 ☐	India—$20 ☐	$40 ☐
Journal of Medical Entomology	$25 ☐	$5 ☐	India—$20 ☐	$40 ☐
Bulletin of the ESA	$15 ☐	$5 ☐	India—$12 ☐	$20 ☐
Insecticide & Acaricide Tests	$15 ☐	$5 ☐	India—$ 6 ☐	$17 ☐
National Conference Program	$ 5 ☐	$1 ☐	India—$ 2 ☐	$ 5 ☐
		Newsletter—All countries outside North America		$11 ☐

(1) Total Publication Fees (Do not include postage)	(1) $	
(2) Subtract $40 Allocation	(2) $	−40
(3) Subtotal (lines 1 and 2) If less than zero, enter zero	(3) $	
(4) Add $60 ($65 outside U.S.) dues	(4) $	+60 ($65 outside U.S.)
(5) Subtotal (lines 3 and 4)	(5) $	
(6) *** Add Postage Outside U.S. for each publication ordered	(6) $	
(7) Subtotal (lines 5 and 6)	(7) $	
Annual Review of Entomology—$30 U.S.; $32 outside U.S. (Maryland residents add $1.35 sales tax)	$	
Additional tax exempt contribution	$	
(8) **TOTAL** (Pay this amount)	(8) $	

See next page for student information
Please complete and return all pages of this application
Send payment with application to

ENTOMOLOGICAL SOCIETY OF AMERICA
P.O. Box 177
Hyattsville, MD 20781

9/87

Student Membership

Please Read Carefully

1. Students enrolled in recognized colleges and universities are eligible for student membership.
2. A student is defined as an undergraduate or graduate student who has had one or more courses in entomology and is taking at least one-half full schedule on a school year basis as defined by the college, and with a major in entomology or a related field.
3. A student must be certified as meeting these requirements by the head of the department concerned or by the student's major instructor. This must be done both at the time of admission to the society and at each renewal date.
4. Upon qualification, a Member may change to Student Member status.
5. A student may use any mailing address that will ensure prompt receipt of publications and correspondence. The society must be notified immediately of any change in address and/or status as a student.

ANNUAL DUES: $20 U.S. ($25 outside U.S.)

For accounting purposes, $7 is allocated to Member Services and the ESA Newsletter. The remaining $13 may be allocated toward ESA journals of your choice at the special membership rates. **Indicate your choices below with an X in the ☐.**

		Postage outside U.S. (Add on line 6 below)	**Optional** Airmail—countries other than India (add on line 6 below)
Journal of Economic Entomology	$13 ☐	$5 ☐ India—$20 ☐	$40 ☐
Environmental Entomology	$13 ☐	$5 ☐ India—$20 ☐	$40 ☐
Annals of the ESA	$13 ☐	$5 ☐ India—$20 ☐	$40 ☐
Journal of Medical Entomology	$13 ☐	$5 ☐ India—$20 ☐	$40 ☐
Bulletin of the ESA	$ 7 ☐	$5 ☐ India—$12 ☐	$20 ☐
Insecticide & Acaricide Tests	$ 6 ☐	$5 ☐ India—$ 6 ☐	$17 ☐
National Conference Program	$ 1 ☐	$1 ☐ India—$ 2 ☐	$ 5 ☐
		Newsletter—All countries outside North America	$11 ☐

(1) Total Publication Fees (Do not include postage)	(1) $	
(2) Subtract $13 Allocation	(2) $	−$13
(3) Subtotal (lines 1 and 2) If less than zero, enter zero	(3) $	
(4) Add $20 ($25 outside U.S.) dues	(4) $	+20 ($25 outside U.S.)
(5) Subtotal (lines 3 and 4)	(5) $	
(6) *** Add postage outside U.S. for each publication ordered	(6) $	
(7) Subtotal (lines 5 and 6)	(7) $	
Annual Review of Entomology—$30 U.S.; $32 outside U.S. (Maryland residents add $1.35 sales tax)	$	
Additional Tax Exempt Contribution	$	
(8) **TOTAL** (Pay this amount)	(8) $	

_____
Signature of Student Applicant

Student Certification

I certify that _____ is enrolled in the Department

of _____ at _____
University/College

_____
Signature—Department Head or Major Professor

Membership Demographic Information

ESA receives numerous requests for information and statistics on various aspects of the entomological profession from federal and state governments and from commercial and independent organizations. We also receive requests to identify specialists in particular fields. The information contained on this form is for the purpose of allowing us to respond to these requests. The information will remain confidential and will not be used in any manner that will exploit or be detrimental to members of the society.

Birthdate: _____ **Gender:** A. Male B. Female

Ethnic origin (race):

A. Caucasian
B. Black
C. American Indian
D. Hispanic
E. Asian

Highest degree:

A. B.A./B.S. in _____ Year _____

B. M.A./M.S. in _____ Year _____

C. Ph.D. in _____ Year _____

D. Other in _____ Year _____

Employment affiliation:

1. ____University, college
   - ____a) administration
   - ____b) teaching
   - ____c) research
   - ____d) extension
2. ____Federal government
   - ____a) administration
   - ____b) research
   - ____c) extension
3. ____State or local government
   - ____a) administration
   - ____b) research
   - ____c) extension
4. ____Student
   - ____a) undergraduate
   - ____b) graduate
5. ____Private industry
   - ____a) administration
   - ____b) research
   - ____c) sales
   - ____d) technical service
6. ____Self employed
   - ____a) consultant
   - ____b) company
   - ____c) research laboratory
   - ____d) medical, veterinary practice
7. ____Museum
   - ____a) administration
   - ____b) curatorial
   - ____c) research
8. ____Amateur, hobbyist
9. ____Retired
10. ____International organization
11. ____Private nonprofit organization

Salary range:

A. Below $10,000
B. $10,000–15,999
C. $16,000–20,999
D. $21,000–25,999
E. $26,000–30,999
F. $31,000–35,999
G. $36,000–40,999
H. $41,000–45,999
I. $46,000–49,999
J. $50,000–59,999
K. $60,000 and up

Circle insect orders in which you are a specialist:

A. Protura
B. Collembola
C. Diplura
D. Thysanura
E. Microcoryphia
F. Ephemeroptera
G. Odonata
H. Orthoptera
I. Dermaptera
J. Isoptera
K. Embioptera
L. Plecoptera
M. Zoraptera
N. Psocoptera
O. Mallophaga
P. Anoplura
Q. Thysanoptera
R. Hemiptera
S. Homoptera
T. Neuroptera
U. Coleoptera
V. Strepsiptera
W. Mecoptera
X. Trichoptera
Y. Lepidoptera
Z. Diptera
AA. Siphonaptera
BB. Hymenoptera

See Other Side

Discipline specialties (circle six):

01—Acarology
02—Agricultural Entomology
03—Agronomy
04—Allelochemicals
05—Allergies
06—Apiculture
07—Aquatic Entomology
08—Behavior
09—Biochemical Control
10—Biochemistry
11—Biological Control
12—Botany
13—Chemical Control
14—Computer Science
15—Crop Protection
16—Cultural Control
17—Curatorial
18—Cytology
19—Ecology/Population Dynamics
20—Economic Entomology
21—Endocrinology
22—Environmental Impact Assessment
23—Epizootics
24—Forest Entomology
25—General Entomology
26—Genetics
27—Genetic Research/Engineering
28—Horticulture
29—Host Plant Resistance
30—Immature Insects
31—Insect Rearing
32—Insecticide Testing
33—IPM—Agricultural
34—IPM—Urban
35—Loss Assessment/Control
36—Medical Entomology
37—Metabolism/Life Processes
38—Microbiology
39—Molecular Biology
40—Morphology/Anatomy
41—Mosquito Control
42—Mycology
43—Natural Enemies (Parasites, Pathogens, Predators)
44—Nematology
45—Nutritional Ecology
46—Organic Chemistry
47—Paleontology
48—Parasitology/Microparasites
49—Pedology/Agrology
50—Pest Control—Commercial
51—Pest Management
52—Pesticide Application
53—Pesticide Development/Analysis
54—Pesticide Registration/Review
55—Pesticide Residues
56—Pesticide Reistance
57—Pheromones
58—Physical Control
59—Physiology/Pathology
60—Plant–Insect Interactions
61—Plant Physiology/Pathology
62—Pollination
63—Quarantines
64—Regulatory Entomology
65—Radiobiology
66—Range Entomology
67—Separation Chemistry
68—Social Insects
69—Statistics/Biometry
70—Stored Foods/Grains
71—Structures
72—Survey, Detection, Monitoring
73—Systematics/Evolution
74—Taxonomy/Classification
75—Tissue Culture
76—Toxicology
77—Tropical Entomology
78—Ultrastructure
79—Urban/Industrial Entomology
80—Vector-Borne Pathogens—Plant
81—Vector-Borne Pathogens—Animal
82—Veterinary Entomology
83—Zoology

Where did you hear of ESA? _____

Why did you join ESA:
- ☐ Professional commitment
- ☐ To publish
- ☐ To attend meetings
- ☐ Journals
- ☐ Other (specify) _____

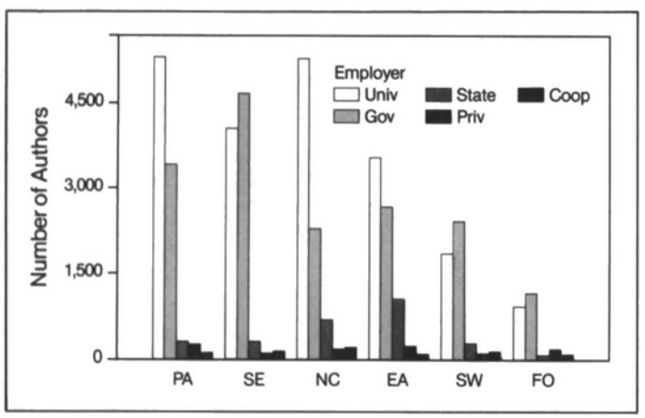

Fig. 12. *Total number of authors by employer, within each ESA geographic branch, for all ESA journals combined. Based on data subset 1.*

were responsible for most of the contributions to JEE, the more applied of the three journals.

The relationship between employer and branch reveals a regional difference (Fig. 12). State-employed entomologists from the Eastern Branch published more than did state employees from other branches. Government entomologists were responsible for most of the journal contributions in the Southern and Foreign Branches. University employees from the Pacific, Eastern, and North Central branches publish the most. This variation may be a reflection of federally funded research grants. For example, although the timing of various "big bug" programs was not included in this study, many have been southern, as have been the chairmen of the Senate and House Agriculture Committees. This regional difference may coincide with the larger number of government-employed members

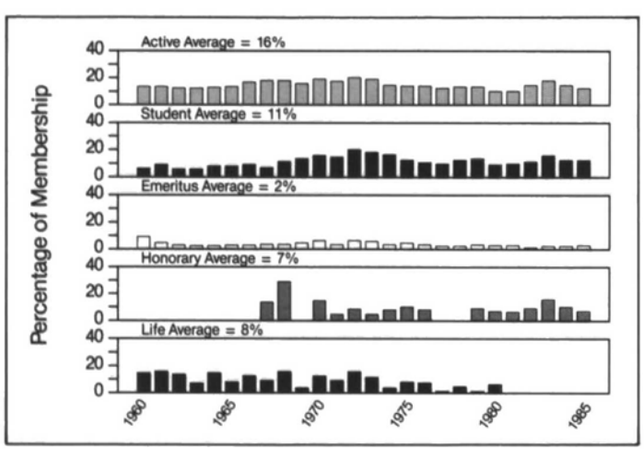

Fig. 13. *Percentage of ESA division members publishing at least once a year in the ESA journals. Number of division members publishing in proportion to number of members in that division. Based on data subset 2.*

publishing from the two southern ESA branches (Fig. 12), as well as the greater proportion of members overall.

ESA Classification. The percentage of each ESA membership classification that published at least once in a single year, averaged over the 26 years, was developed from the second data subset (Fig. 13). As expected, active members—the largest classification of ESA membership—made the most contributions (89%) to ESA publications. However, these contributions were made by only 16% of the active membership. An increase was seen in the proportion of student members publishing in the journals from 1960 to 1970. Because ESA membership lists did not begin to identify the student designations until 1969, student membership before this date may be underestimated. Nevertheless, 11% of the student membership published at least one article each year (9.3% of the total contributions). As a group, emeritus, life, and honorary members were responsible for the remaining 1.4% of the total contributions by members to ESA journals. Life memberships no longer are granted by the society, therefore, the proportion published by this group has declined.

Society Membership and Subscriptions. Subscriptions to ANN and JEE gradually increased and reached a peak of 1.2 subscriptions per ESA member in 1969. In 1972, membership dues and subscriptions were separated. At that time, the number of members subscribing to these two journals decreased by about 50%. One explanation for this decrease was the introduction in 1972 of the third ESA journal. However, the number of members subscribing to EE did not approach the number lost from the other two journals at that time. By 1984 the subscription rate was about 0.48 subscriptions per member.

Conclusion

The usefulness of the journals to the members of the society cannot be determined only by identifying who publishes in them. New knowledge about entomology is certainly obtained from contributions made by other scientists. Although subscription rates are an approximation of the readership, this variable is an inaccurate measure of the widespread use and circulation of ESA publications.

Study of the historical record of ESA publication patterns does provide insight into member use of society journals, however. Although membership has almost doubled, the percentage of the membership publishing in ESA journals was slightly lower in 1985 (12%) than it was in 1960 (13%), and only 16% more articles were published. From these observations, it seems clear that efforts to enlarge ESA membership will not directly and automatically increase the number of contributions to ESA journals. Our society is made up of a small number of scientists who are publishing in and supporting the ESA journals. For various reasons, the majority of ESA members either publish the results of their research endeavors in non-ESA publications or they do not publish at all.

The most noticeable change in publication patterns occurred in the early 1970s. At this time, the number of articles published, the percentage of the ESA membership publishing, and the total number of authors publishing in JEE and ANN decreased markedly

(Figs. 1, 2, 5, 6). ESA membership, however, continued to grow. As described above, several major changes in ESA publication policy, which occurred in the same period, may explain these shifts.

During this period, the economic forces of a national recession most likely had an effect on the budgets and subsequent publication of research endeavors by entomologists. As revealed in this study, it seems clear, however, that ESA publication patterns are tied to changes in publication policies such as rejection rates, page charges, and editorial personnel. So many changes took place in the early 1970s that their individual effects cannot be separated.

In 1985 page charges were reduced and recently one subscription to an ESA journal was reinstated with membership dues. In addition the *Journal of Medical Entomology* was purchased by the society from the B.P. Bishop Museum of Honolulu. Changes such as these will undoubtedly affect the success of future ESA publications as well as society membership in general. The addition of a journal subscription with dues is likely to increase the number of subscriptions per member, but the concomitant dues increase to cover the costs of member subscriptions could reverse the past trend of continuous membership growth. The lowered page charges can be expected to increase the number of articles submitted to ESA journals. Until the effects of these recent changes are manifested—during the next year or two—further major changes in ESA publication policy, such as restructuring, might best be postponed until the effects of current changes can be assessed more objectively. ■

Acknowledgment

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