Domestic and Foreign Periodicals in the Field of Organic Chemistry: A Statistical Analysis

F. S. Boig

Northeastern University, Boston

AS PART of a comprehensive study of periodicals in the field of chemistry, a survey was made to determine the leading domestic and foreign journals in the field of organic chemistry, the relative importance of the journals, the countries of publication, and the languages of publication. Other articles have already been published on this study (*1–4*). The data collected may be used to answer various questions about the literature of organic chemistry, especially as affected by World War II, and questions about the decline in the use of German as a scientific language, and the position of Russian as a scientific language.

Data for the study were obtained from the organic chemistry section of *Chemical Abstracts* (*5*), since it was thought that the number of articles abstracted in this publication should give a good measure of the relative importance of a chemical periodical. Two complete years were taken for the study—1937, a depression and prewar year, and 1947, a postwar year—as representative of the change over the past ten years. The information taken from *Chemical Abstracts* included name and country of the source journal, language of publication of the article, and total number of articles for each journal, country, and language. *The List of Periodicals* (*7*) was consulted as an aid in determining the country and language of individual periodicals. The language of the original article is stated in the abstract for work taken from polylingual journals. The data obtained are here arranged in three tables, by journal, country, and language.

Analysis of Table 1 reveals that *Journal of the American Chemical Society* is far out in front as the leading journal of organic chemistry for 1947, after having shared the honor in 1937 with the German *Berichte,* according to the figures. *The Journal of the Chemical Society* of London has had fewer articles abstracted as compared with 1937, but, because of the fate of *Berichte,* has moved into second place in world importance, though considerably behind the American journal. The third ranking journal from the standpoint of number of articles abstracted in 1947 is *The Journal of the Chemical Society of Japan.* This is misleading, however, as the articles abstracted in 1947 represent a coverage of six years from 1941–'46. Journals showing an increase in number of articles abstracted in 1947 over 1937 are: *Helvetica Chimica Acta* of Switzerland, *Comptes Rendus* of France, *Journal of Organic Chemistry,* and *Industrial and Engineering Chemistry* of the United States. As for the opposite side of the picture, *Berichte* and *Annalen* show a tremendous decrease in articles abstracted. Russia's *Journal of General Chemistry* and Italy's *Gazzetta Chimica Italiana* also showed a loss and Japan's *Journal of the Pharmaceutical Society* dropped out of the 1947 *Chemical Abstracts* entirely.

TABLE 1

ABSTRACTS BY JOURNAL

Journal	Country	1947		1937	
		No.	Rank	No.	Rank
J. Amer. chem. Soc.	U. S.	682	1	337	1 (tie)
J.. chem. Soc., Lond.	England	254	2	307	3
J. chem. Soc. Japan	Japan	219*	3	29	21
Helvetica Chimica Acta	Switz.	190	4	98	7
J. gen. Chem.	USSR	170	5	213	4
C. R. Acad. Sci.	France	151	6	118	5
J. org. Chem.	U. S.	149	7	49	12
Bull. Soc. Chim.	France	81	8	83	9
Bull. chem. Soc. Japan	Japan	75	9	30	19
Ind. eng. Chem.	U. S.	63	10	10	..
Rec. trav. chim.	Holland	56	11	56	12
Gaz. Chim. Ital.	Italy	50	12	100	6
Nature, Lond.	England	41	13	19	..
J. biol. Chem.	U. S.	36	14	46	13
Ber.	Germany	15	..	337	1 (tie)
Ann.	Germany	3	..	88	8
J. pharm. Soc. Japan	Japan	0	..	71	10
Total abstracts		2961		3048	
Total journals			205		222

* Data covers a span of six years.

Analysis of Table 2, summarizing abstracts by country of publication, shows again that the United States is far out in front, with three times the output of its nearest competitor, Britain, having taken over first place, probably permanently, from Germany. Britain has remained stable in number of abstracts, but, because of the collapse of Germany and Russia, has gone from fourth to second place. Germany has gone from first to tenth, with an output only 10 percent of the 1937 figure, while Russia has dropped from third to fifth having an output of only 60 percent of the 1937 figure. France has already staged a comeback from the effects of the war, showing a gain from fifth to fourth and a slight gain in total output. Other countries showing a gain in output are: Switzerland (which has doubled its 1937 output), Sweden, Spain (which shows increases in other fields as well as organic chemistry), Finland, and Canada. Japan shows a large increase, owing to the fact that the 1947 abstracts include a six-year coverage. Large decreases are shown by Germany, Russia, Italy, and India. Effects of the war explain all but the case of India. A smaller decrease is shown by Austria.

TABLE 2

ABSTRACTS BY COUNTRY

Country	1947			1937		
	No.	Rank	%	No.	Rank	%
United States ..	1057	1	35.6	524	2	17.1
British Isles ...	374	2	12.6	369	4	12.0
Japan	329*	3	11.1	205	6	6.7
France	267	4	9.0	232	5	7.5
Russia	250	5	8.4	432	3	14.1
Switzerland	204	6	6.9	99	9	3.2
Italy	76	7	2.5	156	7	5.1
India	74	8	2.5	103	8	3.4
Netherlands	62	9	2.1	67	10	2.2
Germany	57	10	1.9	611	1	19.9
Sweden	39	11	1.3	15	17	0.5
Spain	36	12	1.2	7	22	0.2
Finland	32	13	1.1	15	16	0.5
Canada	20	14	0.7	12	19	0.4
Austria	12	15	0.4	19	14	0.6
Totals	2961			3068		

* 1947 abstracts cover six-year period (1941–6).

Analysis of Table 3, summarizing abstracts by language of publication, shows an increase in the number of articles published in the English language—57.1 percent in 1947 and only 36 percent in 1937. This follows from the increase in United States and British articles and from the fact that some foreign journals are polylingual, one of the languages usually being English. Abstracts of articles in the French language have increased slightly and French is now the leading foreign language, having displaced German and Russian in the past ten years. German is now the second most important foreign language and Russian has decreased by half of the 1937 figure, now being the fourth most important foreign language, if we count Japanese as third. Russian will no doubt recover, but there is room for doubt in the case of German. Languages which have shown a gain in importance in the past ten years are: English, French, Spanish, and Finnish. The increase in the number of Spanish language abstracts is due to increased activity in Spain itself rather than in Spanish-speaking countries, which is evident from checking Tables 1 and 2. Both Italian and Dutch have decreased in importance by half in the past ten years, obviously having been affected by the war.

TABLE 3

ABSTRACTS BY LANGUAGE

Languages	1947			1937		
	No.	Rank	%	No.	Rank	%
English	1691	1	57.1	1098	1	36.0
French	339	2	11.4	301	4	9.9
German	305	3	10.3	773	2	25.4
Japanese	238*	4	8.0	171	5	5.6
Russian	222	5	7.5	395	3	12.9
Italian	76	6	2.6	156	6	5.1
Spanish	48	7	1.6	17	10	0.6
Finnish	11	8	0.4	2	..	...
Dutch	10	9	0.3	24	8	0.8
Swedish	8	10	0.3	8	13	0.3
Totals	2961			3048		

* Abstracts cover six years (1941–6).

It is interesting to compare these results with a somewhat similar study made by Gross (*6*) some twenty years ago. Although the data was collected in a different manner, an examination of this previous study will at least show the trend in importance of the journals and languages in the past twenty years. It indicates that in that time English has forged ahead as the leading language of science, putting German and French into the background. Also, Russian was of very slight importance twenty years ago but is now a serious contender for honors as the leading foreign language. Another item of note is that, whereas the German *Berichte* and *Annalen* were formerly leading journals, they have now lost some of their former importance, and on the other hand, such important journals of twenty years ago as *Journal of the Chemical Society* of London, *Comptes Rendus, Bulletin de la Societe Chimique* of France, *Industrial and Engineering Chemistry,* and *Gazzetta Chimica Italiana* are holding their own today.

The present study indicates that the *Journal of the American Chemical Society* is the leading world

journal in the field of organic chemistry, with the *Journal of the Chemical Society* of London, *Helvetica Chimica Acta* of Switzerland, *Journal of General Chemistry* (USSR), and *Comptes Rendus* of France following in that order. Missing from the more important journals are *Berichte* and *Annalen,* which in 1937 were in the first and the eighth place, respectively.

Among countries of publication, the United States has a comfortable lead, with Britain, France, Russia, and Switzerland following in that order. Germany has lost considerable ground, as has Italy, and Russia has lost a little ground. Sweden and Switzerland have increased in importance.

Fifty-seven percent of all articles published are now in English. French, German, Russian, and Italian, in that order, account for the remainder. The last three languages mentioned have lost ground, whereas French shows a slight gain over 1937.

Japanese periodicals, contributions, and language are placed high on the respective lists, but this is misleading, since the figures cover a six-year range.

References

1. Boig, F. S. *Offic. Dig. Fed. Paint Varn. Prod. Clubs,* 1948, **280**, 412.
2. ———. *Chem.-Anal.,* 1949, **38**: 1, 3.
3. ———. *Oil Gas J.,* 1949, **47**, 199.
4. ———. *Textile Res. J.,* in press.
5. *Chem. Abstr.,* 1937, **31**, 1947, **41**.
6. Gross, P. L. K. and Gross, E. M. *Science,* 1927, **66**, 385.
7. *List of periodicals abstracted by chemical abstracts.* Columbus, Ohio: American Chemical Society, Ohio State University.

Production of Radioactive Mosquitoes[1]

C. C. Hassett and D. W. Jenkins

Medical Division, Army Chemical Center, Maryland

A RELIABLE METHOD of marking and detecting insects is greatly desired in ecological studies of certain medically and economically important species. In regions where pest mosquitoes are abundant, as in the arctic and subarctic, data on the range of dispersal and migration are needed to guide insecticidal control operations

A method has been developed for producing readily detectable radioactive mosquitoes by rearing the yellow fever mosquito *Aëdes aegypti* in beakers of distilled water containing radioactive material. The larvae were fed ground dog-biscuit, using the standard rearing techniques.

Radioactive phosphorus (P^{32}) was selected for the experiments because of its convenient half-life (14.3 days) and lack of either persistent radiation or toxic disintegration products. Its strong beta radiation permits ready detection with most of the equipment in use, and the lack of alpha or gamma radiation makes its use safer. Phosphorus was also judged to be an element which would be readily taken up and retained by the organism.

The activities of mosquitoes, larvae, and solutions were measured in an Autoscaler. The background count of 25 cpm has been deducted from all data in the tables, and all counts over 1000 cpm have been corrected by adding the factor $\left(\frac{\text{cpm}}{1000}\right)^2 \times 5$.

In order to ascertain the optimum concentration and exposure time, the following experiments were performed.

A. Second instar larvae were reared in five solutions of $Na_2HP^{32}O_4$ ranging in strength from 0.05 to 10 μc/ml. All the larvae were greatly retarded in rate of development, and at high concentrations pupation did not occur for over 20 days. At a concentration of 1 μc/ml adults emerged after 15 days and were found to vary in activity from 6,761 to 10,132 cpm.

B. Third and early fourth instar larvae were put into a solution containing 10 μc/ml. They developed normally and adults began to emerge on the sixth day thereafter. The activity of each mosquito was measured on the day of emergence, and the resulting data are given in Table 1. On the tenth day the activity of the solution was measured and found to have decreased to 0.4 μc/ml.

TABLE 1

Activity Measurements of Adult Mosquitoes from Exposed Third Instar Larvae

Days of exposure	No. of adults	Cpm of individual adult mosquitoes		
		minimum	maximum	average
6	12	2,663	132,405	36,215
7	5	7,534	32,143	18,881
8	7	6,036	37,863	29,138
9	5	30,952	39,913	37,176
10	12	4,484	82,860	27,778

[1] A similar article dealing with radiophosphorus and radiostrontium in mosquitoes by John C. Bugher and Majorie Taylor will be published in next weeks issue.