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.

C. Pupae approximately one day old were put into solutions containing 10 μc/ml. Adults emerging 24 to 48 hours later were examined and found to average only 30 cpm above background. Newly formed pupae kept for three days in an identical solution absorbed slightly more phosphorus; ten emerging adults averaged 80 cpm with a range of 40 to 107 cpm.

D. In order to ascertain whether the radioactivity found was the result of an actual accumulation of P^{32} by the larvae, or of contamination of the emerging adults by the rearing medium, third instar larvae were put into a solution containing 10 μc/ml. Eight days later, pupae and fourth instar larvae were removed and washed ten times in distilled water. After an additional 24 hours in distilled water, some were removed and examined. Adults emerging from the washed pupae were also examined. All proved to be highly radioactive, as shown in Table 2. A sample of the water from which these specimens were removed had an activity of 212 cpm/ml.

TABLE 2

ACTIVITY MEASUREMENTS OF WASHED LARVAE AND PUPAE AND UNCONTAMINATED ADULTS

Stage	Number counted	Cpm/individual		
		minimum	maximum	average
Fourth instar larvae	7	13,304	16,876	14,076
Pupae	6	16,878	30,952	26,230
Adults	12	4,484	82,860	27,778

Calibrations of the counting equipment in our laboratory have shown that a rate of 5×10^5 cpm is the equivalent of 1 μc of P^{32}. It can therefore be calculated from the data of Table 2 that the average accumulation of P^{32} by individuals examined as larvae was 0.03 μc in 8 days, while the resulting pupae and adults contained nearly twice as much. Calculations from Table 1 show that much higher accumulations may occur, the highest recorded being about 0.25 μc. Using a generally accepted figure (*1*) for converting curies to grams, one finds that the above values represent 1×10^{-11} and 8.7×10^{-11} g P^{32}.

Additional experiments are in progress to ascertain the minimum quantities of radiophosphorus which can be used, to elucidate further the effects of radiation on development, and explain the wide variation in the accumulation of P^{32} shown by the data in hand.

Highly radioactive mosquitoes can be produced. Larvae accumulate large amounts of P^{32}, but pupae accumulate relatively little. The radioactivity thus produced is not lost rapidly either by adult mosquitoes or by larvae and pupae transferred to a nonradioactive medium.

The method described offers a convenient way of producing marked mosquitoes for studies of dispersal and predation. Valuable data on metabolic activities of mosquitoes, the effects of beta radiation on insects, etc., may be expected from further studies.

Reference

1. MORGAN, K. Z., *J. phys. and coll. Chem.* 1947, **51**, 984.

Neil Elbridge Gordon: 1886–1949

George Calingaert

Ethyl Corporation

My most vivid recollection about Neil Gordon is that of a wintry afternoon in the mid-thirties, when I noticed from the window of my laboratory a man with a large umbrella, an unannounced visitor approaching our lonely building with a slow but purposeful gait, paying no attention to the wind and rain which seemed determined to hamper his progress. Dr. Gordon was on that day bent on one of those missions which endeared him to all who have seen him at work: enlisting interest and cooperation for one of his projects in support of chemical progress. And as the years went by I learned how characteristic that picture was of the man.

Chemical research and the teaching of chemistry have always been the twin interests of Dr. Gordon: after obtaining his Ph.D. from Johns Hopkins University in 1917 he taught successively at his alma mater, the University of Maryland, and at Central College in Missouri and Wayne University in Michigan. His numerous publications reveal his parallel interests in the problems of teaching and in several fields of research, principally in adsorption, colloids, emulsions, and dyeing. His interest in chemists as individuals was as keen as his interest in their work, and many a young instructor or professor still remembers the help and inspiration he received from