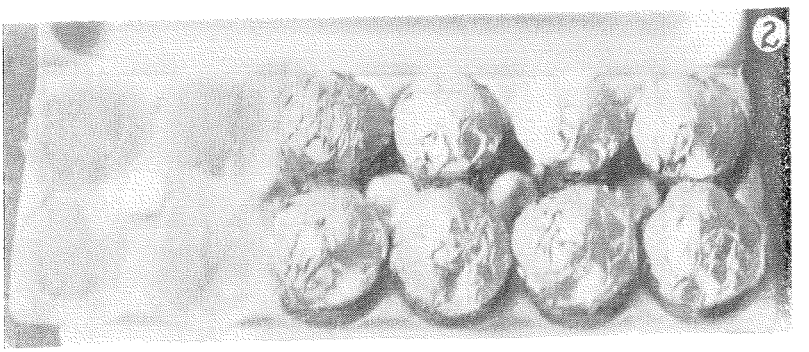

FIG. 2.—Hemispheres of Parafilm and aluminum foil inserted into egg compartments for larval breeding.

top of each compartment a strip of masking, adhesive, or other tape bearing the species name. Some types of containers have flattened sockets, which are quite suitable for direct use; however, others have narrowed bottoms, and in this case flattened plugs can be cut from a sheet of ⅜- or ½-inch plastic foam, and inserted into the sockets. These may be used as they are, or else the top covered with soft white paper. Polystyrene egg containers are waterproof, and may be used for sorting larvae, with or without the hemispheres of foil or Parafilm. If available, refrigerator-type plastic egg containers or trays may also be used for rearing and sorting larvae.

In parts of the world where egg containers are not available, the eggs can be kept erect by setting them into holes cut into a cardboard box or carton, or into wood or plastic sheets. They may also be propped up in sand, clay, or sawdust. Small tumblers or egg-cups of plastic, glass, or ceramic material may also be used. The shells can also be supported by using ¼- to ½-inch wide metal ribbon, in the manner used to support tools of various kinds.

CONTROL OF CATCH-BASIN MOSQUITOES USING ZOECON ZR515 FORMULATED IN A SLOW RELEASE POLYMER— A PRELIMINARY REPORT

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Mosquito abatement personnel responsible for mosquito control in cities recognize that catch basins serve as important mosquito breeding sites. In Stockton, and seven other communities within the district, the San Joaquin Mosquito Abatement District (MAD) treats from 15,000 to 25,000 catch basins monthly to eliminate this potential source of infestation. All catch basins are treated with either an insecticide or an oil throughout the entire breeding season which lasts about 7 months. This requires the services of two full time personnel and accounts for 3 percent of the district's total budget. Any control method which would prolong the effectiveness of each treatment would result in freeing assigned personnel for other duties.

Laboratory studies using slow-release polymers incorporating insecticides have been used for mosquito larviciding by Stockman *et al.* (1970) and Whitlaw and Evans (1968). We have been engaged in both laboratory and field studies using juvenile hormone (JH) mimics formulated in slow release polymers. With a single application, some of our formulations have maintained 100 percent kill of *A. aegypti* for as long as 100 days. These studies will be reported later. In this report we describe the results of one summer's research in the control of *Culex pipiens* Linnaeus in catch basins in Stockton.

METHODS. Technical grade of JH mimic ZR515 (Zoecon Corp., 975 California Avenue, Palo Alto, California) was combined with the polyurethane foam component W of Isofoam PE-12® (Isocyanate Products, Inc., 900 Wilmington Road, New Castle, Delaware) to yield a 3 percent (W/W) mixture at the completion of the foaming reac-

TABLE 1.—Control of *Culex pipiens* in catch basins with ZR515 incorporated into polyurethane foam.

Location of catch basin	Formulation	Percent kill of pupae collected on indicated days after treatment [1] Days					
		25	32	39	46	53	60 [3]
2253 Poplar Street	0% wafer	0.0	0.0	0.0	9.0	0	....
521 Shasta Avenue [2]	1% cage 3% wafer	65.0	67.0	89.5	100.0	100.0	....
2251 Poplar Street	3% wafer	90.0	100.0	96.8	100.0	100.0	89.0
545 Shasta Avenue	3% cage	....	100.0	100.0	100.0	50.0	....

[1] Pupae were 20–30 individuals per sample. If an adult failed to survive 24 hours after emergence, it was recorded as "dead."

[2] The 1% cage was removed from this basin at 28 days and a 3% wafer was added.

[3] Rainfall on day 57 washed all larvae and pupae out of 3 of the basins.

tion. The foaming reaction was produced by mixing 100 parts (by weight) of Isofoam PE-12 component A with 75 parts of component W. After combining parts A and W, the viscous mixture was poured into a petri dish to harden. This produced a wafer of the polyurethane ca. 7 mm thick and 9 cm in diameter. To prevent the wafers from being washed out of the catch basins, a 3-ounce weight was attached with a 10 cm length of nylon-monofilament line. Thus, if the water in the catch basin was deeper than 10 cm, the wafer was completely submerged; otherwise, it simply floated on the surface. Polyurethane wafers of 0.0 percent, 1.0 percent and 3.0 percent ZR515 (W/W) were prepared. We also prepared 1.0 cm cubes of foam containing 1.0 and 3.0 percent ZR515 and enclosed these in ⅛" mesh hardware cloth cages, 9 x 9 x 9 cm. The cages and wafers were simply dropped into the catch basin to implement treatment.

Ten catch basins were treated by applying one wafer or cage to each basin on August 2, 1972. The basins were clearly marked so the field crew would not accidentally treat them. Each basin was visited weekly thereafter and if pupae were present they were sampled and returned (in catch basin water) to the laboratory for evaluation. Evaluation was based on the inability of the adults to emerge from the pupal case. As the basins selected had been routinely treated before we applied the wafers, 2 to 3 weeks passed before larval populations were re-established. Populations became re-established in only 4 of the 10 basins treated. Thus, our first samples were taken from the 4 active basins 25 days after the polymers were applied.

RESULTS AND DISCUSSION. The pertinent results are summarized in Table 1. A single application of a 3 percent ZR515 wafer resulted in a high degree of kill for almost 2 months. Enclosing the formulated foam in cages proved satisfactory, provided no growth of algae occurred on the cage. In the basin at 521 Shasta, the cage was covered with algae by day 25. We attribute the reduced larval kill in this basin to the presence of the algae, which impeded the diffusion of the JH throughout the basin. Water flowing through the basin located at 545 Shasta on day 50 reduced the kill from 100 to 50 percent.

These preliminary studies demonstrate the potential effectiveness of a slow-release polymer—JH system. In other unpublished studies we have found that a single application of ZR515 at dosages of 1.0 p.p.m. was effective for only 2–3 days, depending upon how biologically active the water was. The slow-release polymers effectively overcame this short residual problem. On the basis of these studies, we believe that future experiments involving catch basins initiated early in the breeding season may result in effective control for the entire season with a single application of a JH-slow release polymer.

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