temperature until November 12, 1959, when the first adults emerged. Additional water from a tap was added from time to time, and a few larvae were killed at these times.

The author's identification was confirmed by Dr. Harry D. Pratt, Scientist Director, Training Branch, Communicable Disease Center, Atlanta, Georgia.

Although very little is available in the way of references to the mosquitoes of New Mexico, except a check list by Ferguson and McNeel (1954), and a distribution list by Fourth U. S. Army Medical Laboratory (1958), the author believes this constitutes a new State record and the most westerly record of the species.

References

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OPERATIONAL NOTES

P. BRUCE BROCKWAY, JR.

As each of us becomes more involved in our interests or efforts related to mosquitoes, I am sure that we will admit (at least to ourselves) that we realize that we have a lot to learn and there are many unanswered questions related to mosquitoes and their control. This would be true regardless of our interest, whether in operational activities, research entomology, chemistry, or engineering. Co-operation between these professions will ultimately lead to success because all are faced with the same problem, which is the need for more dependable knowledge. Recently Toledo, Ohio was exposed to an increase of *Culex salinarius,* and efforts were made to gain more information pertaining to the why's, what happen's, and other such questions. Many of these questions and their answers are not recorded in book form. Consequently, it would be difficult to answer those questions. We hoped to find some of the answers in the seminar on Northeastern *Culex* mosquitoes that was being put on by Bob Armstrong and his Boston cohorts. This program was held August 8 and 9; therefore, I went to this gathering armed with many questions pertaining to *C. salinarius.* When we met and discussed *salinarius,* of course *pipiens, restuans,* and other *Culex* mosquitoes were also brought into the conversation. All of us attending this meeting had questions and many of these could not be answered with documented evidence. There were many opinions and theories, but supported and well studied information was lacking in spite of the fact that all of these species were old problems to the average mosquito control worker. This meeting served to emphasize the need for co-operative efforts between research and the operational groups. Various types of information such as collection and biting data and habits will be exchanged between these two groups as they meet again sometime in the future. I am sure that at a later date Bob Armstrong will be in contact with various operational groups and ask their co-operation in getting specimens and cultures of the various species of mosquitoes for certain research labs. It is our very firm opinion that by this detailed study research can show those of us in the operational field how we can save money for our taxpaying public. We are also very sure that in various parts of the country various mosquitoes have different habits and here, too, lies a clue where operational problems may be made easier for those of us working on the control of the mosquito.

The problem of instruction for field personnel has always confronted the superintendent or manager of a mosquito control organization. Some of us have written pamphlets including field identification of mosquitoes, others have schools for field personnel, and some just depend on experience and supervision as a key to instruction. All of these have a place in this education of the field personnel. But during the recent years, various agencies and companies have been making movies of mosquito control in the field that may be of assistance to the operational group requiring instruction. These films can be obtained merely for the writing and the request. California Chemical Company, Shell Oil, and the U.S. Department of Health, Education and Welfare, and the Department of Agriculture are examples of where the films may be obtained. Some states and districts that have extensive programs also have films which are available for their personnel. In some cases these films can also be borrowed by out-of-state organizations. California, Florida, and I believe New Jersey have such films available. Non profit organizations such as Cornet have instruction films on mosquito and fly control. Your editor would be glad to receive information of other sources.

Chet Robinson of Alameda County, California recently sent me his annual report, which covered all phases of mosquito control used in his district including public relations, source reduction, biological control, chemical control, and specific

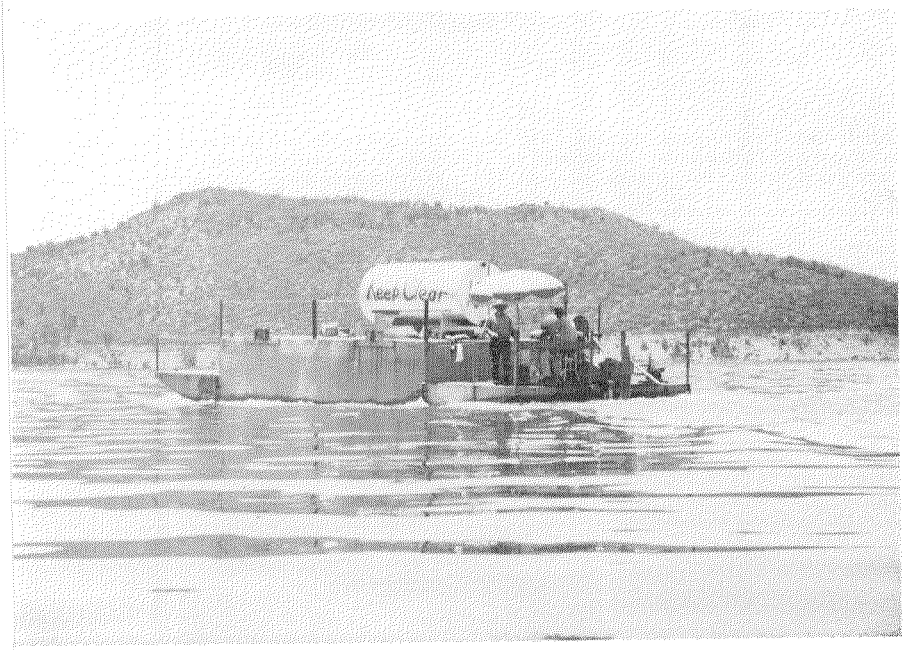
problems such as tree holes. From time to time I receive various annual reports of districts throughout the country and it is very interesting to note how each of us spend our taxpayers' money. Some districts budget heavily on equipment, others construction, and still others on salaries as well as maintenance. Each part of the country requires a different approach to budget, but it is all based on the problems confronting that district. Your comments would be appreciated on this subject.

BILL HAZELTINE OF LAKE COUNTY MOSQUITO ABATEMENT, Lakeport, California, sent us the description and pictures of a barge-mounted insecticide applicator that was developed between Mr. Arnett Camp and Bill. This equipment was constructed to answer a problem that they had on Clear Lake of California. We quote the letter:

"Clear Lake is over 41,000 acres in surface and applying a dose of insecticide to this body of water presents a lot of problems in application. The desired dose was from 2.5 to 3.3 ppb and the equipment available consisted of four barges similar to the one shown in the photograph. The insecticide, methyl parathion, at the applied doses has a very good safety factor for fish and humans, but it was still necessary to devise a precision metering system for this application. The problem was to get an even dispersion of the insecticide into the lake as rapidly as possible and still not have bands of excessively high concentrations.

"In the first application we applied an acetone solution of methyl parathion, and in the second application we applied an emulsifiable concentrate of the same insecticide. The diluting carrier in both of these formulations was acetone, and as a consequence we had a pressurized system in the big tanks on the barges. The main fill spout on the tanks was equipped with a four-pound breaking pressure cap which prevented excessive vapor loss and contributed to the pressurized system. Both ends of each tank had teflon sight gauges to allow us accurately to assess the remaining volume in each unit.

"The essential elements in the metering and application system were: (1) A 6,000-gallon-per-hour gasoline-driven water pump. This is visible on the stern on the barge in the picture and the discharge from this pump was conveyed to a point immediately ahead of the propeller on the power unit below the water line. During operation, this pump was running continuously picking up lake water and discharging it into the wake of the barge. This gave a two stage dilution to the insecticide. The insecticide was metered into the inlet side of the water pump and mixed by the



impeller before discharge in the lake. The propeller on the Harbormaster power unit is 34 inches in diameter, and it turns at about 600 rpm.

"The insecticide metering equipment consisted of an S & K rotometer with a needle valve in the line. This is shown center in the closeup photograph. To the right of the rotometer is an electronic depth meter which registers continuously the depth in feet. We set arbitrary swath widths between barges and calibrated the speed of the slowest barge. With these two measurements and the depth in feet, we were then able to calibrate the flowmeter directly so that the setting would correspond to the feet of depth for the desired concentration of insecticide. The position of the needle valve between the rotometer and the water pump is an important point. On the first application the needle valve was ahead of the meter and as a consequence the reduced pressure caused excessive bubbling of the acetone in the meter, and the calibration was distorted. By shifting the valve to its present position we have eliminated the bubble problem, and in the second application the system worked beautifully. We were able to treat the entire lake in a two-day period with the four barges.

"Because methyl parathion is extremely toxic, we designed the system to be completely closed. This eliminated any unnecessary or chance contact with the insecticide by the barge operators.

"To the left of the rotometer is a 'handy-talkie' radio; this was important for proper communications during application. A control boat which worked with the barges was able to indicate any changes in procedure which were necessary, and to maintain periodic readings on the condition of the system and the amount of insecticide which had been applied.

"We trust that this information will be of interest to you and possibly to your readers. We have enjoyed the ideas of others and wish to make our contribution to the field as well."