

## ARTICLES

### PRESIDENTIAL ADDRESS: OUR RACE TO THE FUTURE

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**ABSTRACT.** The need for mosquito control is documented from history books with comments about hoards of mosquitoes, deaths from mysterious high fevers, and yellow fever, malaria and dengue. The paper traces the birth of mosquito control in the United States to the present time with a look into the future. Regulations are discussed and their effect on mosquito control methods. Public education and training of personnel is mentioned. The author's opinion of AMCA's role in the future of mosquito control and research is one of prominence and leadership.

#### EARLY MOSQUITO CONTROL

"History repeats itself, but each time it does the price goes up." "Sin writes histories, goodness is silent." "Those who do not study the past will repeat its errors; those who do will find new ways to err." Do these well used quotations relate in anyway to mosquito and vector control in 1990? Certainly they do!

We in mosquito and vector research and control have a well documented history, beginning in the late 1800s. In my opinion it is a proud history.

Mosquitoes have tormented man since ancient times, and the mosquito situation was well appreciated in early times in the United States. History books abound with quotations on mosquitoes and their abundance, especially in coastal areas. Dr. William Currie of Philadelphia in 1792 said: "The flat and marshy parts of this State (New Jersey) which are very numerous are infested with myriads of mosquitoes which give intolerable annoyance to man and beast. Their bites often occasion an Erysipelas, both painful and dangerous."

J. B. Brissat De Weiville in 1788 said: "The road from New York to Newark is in part over a marsh. I found it really astonishing. Built wholly with wood, with much labor and perseverance in the midst of water, on a soil that trembles under your feet, proves to what point may be carried the patience of man, who is determined to conquer nature. But though most of these marshes are drained, there remains a large extent of them covered with stagnant waters, which infect the air, and give birth to these mosquitoes with which you are cruelly

tormented; and to an epidemical fever which makes great ravages in summer; a fever know likewise in Virginia and in the southern states, in parts adjacent to the sea."

French efforts from 1881 to 1889 to build the Panama Canal had been repeatedly stopped by malaria and yellow fever. Only after Dr. William Gorgas instituted mosquito control programs in Panama, was the United States able to complete this waterway between the two oceans. In 1900 a U.S. Army Commission with Major Walter Reed as chief, investigated an outbreak of yellow fever among American troops in Cuba.

As Dr. Lewis Nielson so ably summarized in his September 1979 National Geographic article, "Whatever other harm mosquitoes may do, none of it can compare to the devastation caused by the diseases they have inflicted on mankind and other animals."

Mosquito work in New Jersey was begun by Dr. John B. Smith in 1900 with the first publication occurring in 1904. State statutes mandated mosquito control throughout the state with amounts of monies written into the law. Public pressure caused the county government to establish mosquito commissions from 1905 to 1965. The Agricultural Experiment Station under J. B. Smith and later Thomas J. Headlee took a lead roll in water management, advice to the counties and mosquito surveillance.

Organized mosquito control in Florida began in 1922 with the establishment of the Indian River and St. Lucie County Mosquito Control Districts. Dr. Joseph Yates Porter was the State Health Officer at that time. In 1932 Dr. John Mulrennan began a mosquito control program for the purpose of malaria eradication. In 1941 he became the first state entomologist for the Florida Health Department. Other districts formed over time, but the first mosquito control project was conducted in Perry, Florida, in Sep-

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tember 1920; at that time it was estimated that one-half of the people in Perry had malaria. The project, which was water management, was funded jointly by Perry, Taylor County and a lumber company whose workers were greatly affected by mosquitoes. The project cost \$30,000 and the lumber company said it was the best \$10,000 they ever spent. The Florida Anti-Mosquito Association was established in December 1922.

Another southern state, Louisiana, was into mosquito control early after the turn of the century; Dr. George Beyer of Tulane University was the earliest recorded worker in 1901. Federal workers helped mosquito control in Louisiana in 1935. In 1957, E. S. Hathaway from Tulane organized the Louisiana Mosquito Control Association and the first organized mosquito control district began in 1964.

The neighboring state of Texas began mosquito control in the early 1900s. In 1911 Victor Eilthers, first sanitary engineer at state level, actually raised *Gambusia affinis* on the grounds of the Texas state capitol in Austin. This was an early biological control program.

The state of California also began in the early 1900s. The first recorded attempt to control mosquitoes in 1903 used Panama larvicide. In 1908, William B. Hermes, University of California, and in 1910, Harold Gray of the Alameda County Mosquito Abatement District were probably the "fathers of mosquito control in California." An early cost estimate of 40 cents per square mile per day to control mosquitoes was given.

In my own commission, Cape May County, New Jersey, the first appropriation was \$2,000 in 1915 with the promise of \$8,000 more as taxes were collected over the course of 1916. These were days of beginnings. Their trials and tribulations were far greater than our own today, but they believed in mosquito control and certainly championed the cause.

When it was finally recognized by the general public and the lawmakers that mosquitoes vector disease as well as have a detrimental effect on the economics of an area, laws and funds began to show up on the books throughout the country, particularly in coastal areas.

Prior to World War II and from 1941 to 1945, monies were hard to come by. In spite of this, research and control efforts continued throughout this time.

After 1945, and with the use of DDT, mosquito control efforts took off in the United States and around the world.

The global incidence of malaria during the 1940s and early 1950s was estimated at 300 million cases annually. The World Health Organization mounted an international malaria

eradication program beginning in 1956. At this time, the world was well aware of mosquitoes and the havoc they caused.

## RECENT CHANGES AND PROBLEMS

The 1960s was the beginning of change, a time of unrest in this country. *Silent Spring* by Rachel Carson was published. Earth Day 1970 marked the beginning of environmental awareness in the form of laws and regulations. Some of these laws and regulations were long overdue and some were unreasonable. Suddenly it was fashionable to be an environmentalist. I resent this in many ways because I feel we in mosquito control were the first environmentalists when it was not the in thing to be. We cleaned up after careless builders moved out of a newly developed area and eased the drainage problems that caused mosquito breeding. We established ponds and ditches in marshes and uplands that were beneficial to wildlife and increased productivity on marshes. We were the first biologists who knew the value of a marsh and that it was not just a vast wasteland to be filled. We knew filling would create an entirely new set of problems.

The 1980s with the advent of high technology and procedures capable of testing for parts per trillion, have changed the thinking of many Americans. Many things used to be judged as risk vs. benefit. Today zero risk seems to be the public's desire, an unattainable goal. People are bombarded with reports of toxic and hazardous chemicals in their air, water, food and soil. They are conditioned to be afraid and wary. The media prominently publishes the results of a single test and allows the public to judge its validity rather than the scientific community. Nonscientific minds do not understand the patience and repetition needed for valid scientific testing to draw conclusions. Present day media enjoy and promote sensationalism and politicians and lawmakers react to public sentiment, sometimes rightly and sometimes wrongly. At times we Americans become so involved with our own problems we forget what happens in the rest of the world.

Last April I spent a few weeks in England, my first time out of the country for a few years and my second time in Europe. Perhaps we should all be able to stand outside and look in to see ourselves as others perceive us. It is an eye opener. Priorities are very different. Many countries that are striving to improve their quality of living and those whose very lives depend upon good mosquito control must look upon the United States incredulously for voluntarily reducing the very programs they need so desperately. So where does all this change leave those of us who have spent our lives in mosquito and

vector control? How does it affect our programs as we go racing toward the future in the 1990s and into the next century? How does the American Mosquito Control Association fit into this picture? These are all questions that must be answered.

We are facing many problems in mosquito control in our race to the future. They seem to loom on the horizon everywhere we look.

The most pressing problem, in my opinion, is that of legislation. There is so much new legislation being promulgated today, it is difficult for one to know where or when to look or how to comply. The *Federal Register* is a good source but it takes a considerable time to read. Each state has a similar legislative index that can be used. Public libraries usually have these on hand. There are many lobbies in Washington and state capitals, many of which contain anti-pesticide people who are very persistent.

The AMCA Environmental Protection Committee along with others, and especially the California Mosquito and Vector Control Association, succeeded in obtaining a Public Health Emergency Exemption written into the Endangered Species Act. It was published in the July 3, 1989, *Federal Register*. This was an important step in recognition of our problem and our profession. It was a concerted effort by all and it was successful. Clean air, clean water and pesticide legislation will affect our programs in the future. Again, our technology is capable of measuring minute amounts of matter that were previously absent but are now present in our environment in measurable amounts. Where does judgment enter into the picture? Who makes these judgments of acceptable levels? Hopefully it will be based on sound scientific fact and not emotions or for political reasons.

A second most prominent problem is funding. This is not one confined to mosquito control, but all governmental agencies are concerned in days of diminishing budgets, both federal and state, to a point where there is almost no fat left. Budgets are pared to the bare bones. Valuable programs are being eliminated at all levels of government from the federal right on down to the municipal levels. Priorities have to be set and in many instances an old saying, "the squeaky wheel gets the grease," is very applicable today. Research funds and grants are drying up; a bad thing in these days of environmental concerns when we need additional research to look for alternative methods to add to our arsenal of mosquito control tools.

Following right behind funding and probably going hand in hand, is our public image; the way the public perceives those who work in mosquito control. Walt Disney produced a movie in the 1940s. It was a cartoon that glorified mosquito

control and told how people could help control mosquitoes, protect themselves from malaria and help the brave people who were out there fighting the mosquito war. This cartoon probably did more to help the image of mosquito control for that period than any other means of public relations at that time. It perhaps worked for mosquito control the same way Walt Disney's *Bambi* worked against the hunting interests. Now I am not saying we should produce another cartoon. I am not sure the American public would even accept it, but I am saying we should explore every avenue to produce a positive public image because public pressure produces funds, as if miraculously, from governments who claim to have been drained dry.

Public education is a problem for us only because we are not doing it. It is a positive thing or could be positive. It is a partial answer to the image problem. It is self-serving but it is also our responsibility to educate the public. Most of us in one way or another are paid by taxpayers funds, either directly or through grants. Taxpayers like to know where their monies are going. Sometimes they do not like what they hear but we still have a responsibility to let them know.

Training and education of our personnel is lacking in some areas. Unfortunately, this type of problem reflects on us all. If we have 300 agencies in the country that are providing proper training and education for their personnel and 30 are not, the 30 that are not will cast a shadow over the others. If there are any new laws that should be passed, those requiring education and training for all personnel, especially those applying pesticides, should be considered. This means continuous training, with frequent updates under supervision. In most states pesticide applicators are now required to be certified.

I have concentrated on the problems of our profession now I would like to talk about the successes and how to address the problem. First of all, we have all become more acutely aware of impending legislation—federal, state and local. Environmental groups have networked successfully. We must do the same. We must all join together in this effort combining our knowledge, talents, political force and lobbies to obtain input into legislation and the rules and regulations that follow, prior to their passage. We must make ourselves and our mission known to legislators, to their aides, and follow and be familiar with the state and local political situations in order to be ready to get our message across. We need to be persistent and vigilant in this quest.

As we obtain input into legislation, we also get a better handle on funding. This is a tough problem for all and cannot be solved in everyone's best interest but we can compromise and communicate our needs. There will be times,

many times, we'll be ignored but again we must be persistent and organized. A well planned budget usually has the best chance of survival in the political process. If you are lucky enough to be asked to defend the budget, your chances of adequate funding increase. It is an important process. Many times we are not asked for input into financial planning and just have to take what we get but we still cannot stop trying.

Public education is something we can do; all of us. By running good service oriented programs, with special attention to complaints, the word gets around that we can help and that we do perform a service. We need to get our message across. Many universities have courses and local control districts conduct civic centered programs that provide insight into mosquito and vector control services and the reasons for these services. Education of school children is very important. These children are our future. If they learn early in school that mosquito control can be compatible with a clean environment (and they certainly are taught a great deal about the needs for a clean and healthy environment), then our future politicians and taxpayers might not have the unfavorable impressions that our programs generate today. How many of you have ever been asked, "what do you do in the winter?" How many of you are told, "I thought all you people did was ride up and down the street with a spray truck? I used to ride my bike in back of those things when I was a kid." I hope my grandchildren will not think that this is all we do and not even know mosquitoes can carry disease or think that personal protection is not their responsibility because mosquitoes are just a pain, not a risk.

What about tick-borne diseases? Lyme disease. Now this has captured the imagination of the press these days as much as anything can outside of AIDS. How much research has been funded? Probably more than mosquito research because the problem has been publicized. We need to educate the public continually at every opportunity. You might say, I don't have the time or the money. That was always my excuse. I'm too busy and I need to spend money on mosquito control not the press. I have come to realize today that if I do not take the time and the money to educate the public there will be no program with which to be busy. No excuses—just do it!

This meeting is an example of education by exchange of ideas and information at its best. This is AMCA's 56th such program. They must continue well into the future.

Lastly, training and education of our own people is a must. Many state associations and universities do an admirable job at this. The Florida Mosquito Control Association Work-

shop in which some of you will participate at this meeting, is an excellent example of employee training and certification. Even if you have a small association or if you do not have an organized state association in your town, county, parish or country, try to find at least one qualified expert or perhaps you yourself train the people involved in their job. Help them to understand why they do the things you tell them to do. They need to understand what species of mosquito or pest they are controlling; the habitat and the importance of control. So often managers do not take the time to communicate with the laborers, pesticide applicators and inspectors working in the district. It is not always possible with time constraints but care should be taken that they understand thoroughly their duties and the reasons behind them. They must be responsible for their actions. Qualified people must be hired. This is not always easy with less funding available and personnel restrictions such as civil service regulations and labor unions and political appointments. One qualified person is far better than four people who do not measure up to the standards necessary to produce a quality program.

#### FUTURE ROLE FOR AMCA

And finally, how can the American Mosquito Control Association take part in all of this? I have been talking about local control districts and researchers in universities, and perhaps the commercial applicators and those generally responsible for control and research programs individually. How about collectively? What can we do together?

I perceive in the future, AMCA taking a lead as a coordinating agency in mosquito and vector control. The public image of AMCA as a scientific-professional association has been built over the years as an organization with integrity that has emerged into the 1990s unscathed by unfavorable public sentiment. This Association has become international in flavor with regions extending outside the United States with many members from other countries. We welcome this and we can be a leader. This Association has the talent, knowledge, and skills in its membership that can lead us into the future on the right path. We are actively seeking to join with other societies to pursue the networking of legislative information so that it may be disseminated to our members. We are actively supporting training and educational programs in the universities, the most recent one at the University of South Carolina in McClellanville. We have formed committees to work toward input into the labeling process of chemicals with regards to mosquito vector control, and agencies such as EPA

are beginning to listen to our requests and ask for our input. We are opening our thoughts to the operational people who have good, sound, economical suggestions to make with regards to problems that arise during the course of the day out in the field and we are asking them to communicate with us so we may pass on the ideas to others.

Dr. Ronald Ward informed us in October of 1989, our journal, *Journal of the American Mosquito Control Association* is one of the top 15 international journals in the field of entomology. This is something of which we can be proud. We are providing educational tools, displays, visual aids for our members as well as updating bulletins that can be helpful to all. Our quarterly newsletter keeps us in touch. We need to promote within our universities the need for medical entomologists in the field. We can and must be progressive and take our message to the people and not sit back and wait to be asked. We must be proactive—not reactive. We must actively seek publicity and manage the outcome to the best of our ability. We must also recognize that a few people are anti-mosquito and vector control and a few are anti-everything. We must recognize this and not waste time on these situations. We must seek to educate those with an open mind or at least those who are interested in facts. We must not be afraid to talk about vector-borne diseases but we must not become sensationalists.

This past year, the AMCA has embarked on an ambitious plan to become progressive and proactive. We would like to provide more services to our members without membership becoming too much of an expense. We must set priorities. There are many irons in the fire as

we head to the future but it is going to take a concerted, united, organized effort to push ahead with our programs if we want them to be funded and successful in the 90s. We must be vigilant and most of all persistent. We must not see all as gloom and doom, because there is a much brighter side if we all work together. Through AMCA we can do this. This Association has been intact since 1935 and continues strong today. We are a healthier and longer-lived society today. This is a success story. Many of our distinguished colleagues of the past managed to get their message across. It is now our responsibility to carry the message to the future.

We have studied the past and opt for the future. It looks difficult but not insurmountable. Let's use AMCA as a central important tool in our race to the future.

I would like to thank you for allowing me to serve as your president this past year. It has been an honor and a pleasure.

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