A DYNAMIC TRIANGLE FOR MOSQUITO CONTROL

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There is sufficient technology available for practical and economical mosquito control, although much of it may not be used because of overly restrictive regulations, political considerations, lack of knowledge in depth, false economy, or for other reasons.

It is no accident that this technology has been developed and accumulated. The extraordinary historical accomplishments of yellow fever and malaria mosquito control in Havana and in Panama resulted from well-supported, applied technology based on research on mosquitoes. It is amazingly significant that these projects could have been classified as "integrated control" or "comprehensive control," although undertaken long before we had begun to use these terms and before the press had popularized the concepts of "PROTECTING THE ENVIRONMENT" and "ECOLOGICAL CONSIDERATIONS."

One may conclude that the early technical specialists upon whom responsibility devolved were certainly as intelligent and progressive as any of us, and that in the absence of pre-conditioning experience with procedures that have since become common, they must have carefully observed the causative conditions and applied the various remedies that appeared best suited to the individual problems. Note that they adapted various equipment and materials that had been devised for other purposes, as well as using customized approaches; and commercially-produced items played a part in their successes.

Through logic and analysis the first mosquito control workers arrived at a program which closely parallels those of which we today are so proud, and which have brought an extraordinary level of freedom from mosquito annoyance and mosquito-borne diseases to our citizens. Over time we have greatly improved the technology, but no great change has taken place in the principles applied.

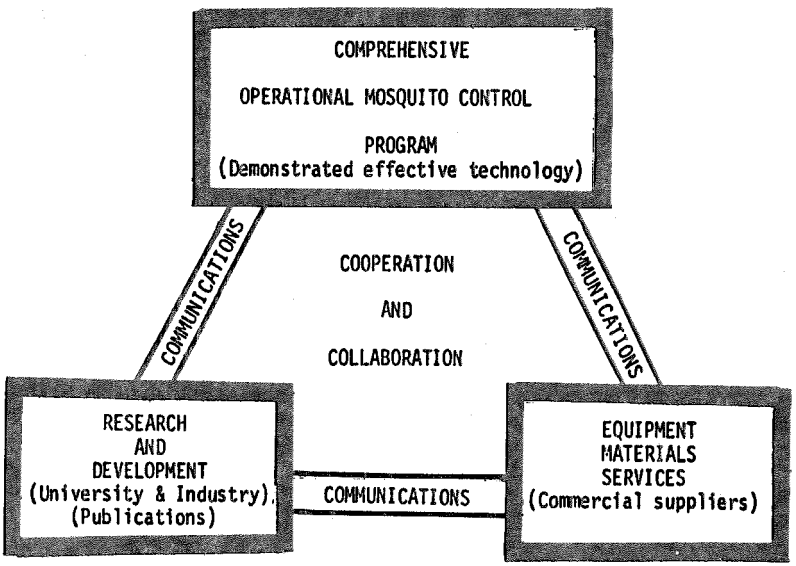
Let us try to summarize where we stand

today, perhaps as a basis for looking forward to an even more complex and more technical future. (See Fig. 1.)

One might call this "the eternal triangle of successful mosquito control." The spearpoint of this triangle is the COMPREHENSIVE OPERATIONAL MOSQUITO CONTROL PROGRAM. This is what it is all about—the operational districts, commissions, and other agencies that do the work in the field that protects the people and yields for them a more satisfactory environment for everyday life. Without these programs there would be no need for the other elements of the triangle, and workers in successful local programs may be proud of their accomplishments. Let us fully understand and appreciate that the mosquito workers of the USA collectively know more about mosquito control than any other group in the world, because more diversified problems here have been solved during nearly ¾ of a century of practical mosquito control, guided by unsurpassed management and by superb research and technical development.

If you can objectively examine your own program (perhaps it would be easier to be objective if you look over the fence at the neighbors program) and try to determine how much of the technology is original, and how much was drawn from some other successful operational or research programs, I'm confident that you will conclude that the selection and management of control measures in relation to your own problems are the principal factors that are original with you! Properly so, because if we are truly scientific and dedicated we will constantly be striving to find the best means of accomplishing our defined purpose! In my opinion, this is the primary basis upon which mosquito control associations (AMCA and others) are founded—mainly as a vehicle for the exchange of ideas and technology.

Most of the technology in daily operational use was developed 5 to 10 years or more earlier—and much of that in any single program was borrowed from other programs where it had been tested and proved successful. But there is another productive source of essential information—the universities and other research and development agencies, including also the commercial interests. Al-



though current research often may not surface as operational procedures for 5 to 10 years, without the continuing evolution of new or better techniques, materials, and procedures, we might well run out of effective technology. The research and development element must be supported and encouraged, as an essential part of the fundamental basis for continued success.

When surveys and studies reveal what we must do and we determine how we want to do it, we are invariably confronted with enormous needs for equipment, materials, supplies, and sometimes special services. Mosquito control agencies have shown great versatility in developing or adapting some of the items that they need and they are to be complimented and encouraged to go as far as they economically can, but what local agency can produce its own insecticides, vehicles, aircraft, tools, etc? For these supportive items they must turn to commercial suppliers. The commercial suppliers are essential partners in the work we are doing for the benefit of the public. Without them we could not function. True it is that they are motivated by a profit motive, but what is wrong with that? The profit factor is the insurance that provides continuity of essential supply. But commercial participation does not end there—many of the suppliers have provided valuable help in many ways to facilitate research, introduction of materials and techniques, public awareness and support, etc. For this we are grateful.

Our gratitude should take on a practical aspect: Where industry is hampered in producing products for our needs by unduly restrictive regulations, we should be seeking compatible ways of lessening the restrictions. An example is the case of new insecticides and the problems and costs of obtaining registration. It is costly to produce and test a pesticide to a degree that will permit the industry to consider marketing it for public health purposes. But we are told that there is then an additional enormous burden of testing that must be done to satisfy the regulatory agencies, and the cost may run from $3 million to $10 million for a single chemical. But the entire annual pesticide budget for all mosquito control agencies in the USA rarely if ever exceeds $10 million for an entire season. Obviously a chemical company cannot spend $10 million to register a pesticide if the entire potential market is less than that amount! The predictable consequence is that we shall run out of insecticides if some relief is not found!

What then is the answer? Since Congress created the barrier of restrictive legislation, and the ultimate consequence may be the severe impairment of the health and/or comfort of the people, would it not be logical to suggest that Congress provide support, and require the Public Health Service or the USDA to obtain at federal expense the registration of chemicals needed for public health purposes?

Referring again to the triangle chart, one may note that the role of AMCA and of the other scientific and educational vector control organizations is mainly one of providing communications and promoting cooperation and collaboration. By keeping each of three primary elemehts of this dynamic triangle healthy, strong, and functional, we can be assured of continuing successful mosquito control—but if any one of the three should be allowed to fail, then the consequences will be great indeed!

In conclusion, it is now popular to promote "integrated control," and it is implied that this is a newly discovered approach! Yet if you refer to Table 1, of the paper immediately preceding this one, it may be considered as a check list of commonly applied mosquito control measures in use throughout most of the long history of successful mosquito control, and then you will become fully aware that within operational mosquito control the term "integrated control" is merely a new name for a very old and very familiar balanced program, one that combines in optimum fashion biological control, physical control, and chemical control.