In accepting the Martha M. Eliot Award last year in Detroit, Dr. Bierman considered how specialists in maternal and child health might throw off their specialist blinders, and look at the health problems of mothers and children in terms of root causes and their prevention. What she says applies not only to MCH, but with equal weight to all public health workers.

SOME THINGS LEARNED

Jessie M. Bierman, M.D., M.S.P.H., F.A.P.H.A.

I CHERISH the honor bestowed on me in the name of Martha Eliot. For it was she, more than any other, who provided the model and the motivation for my early days in public health. To her vision, courage, persistence, patience, and prodding, the field of Maternal and Child Health, and most of us who have tilled that field during the past 30-40 years, owe much.

My return to my native state of Montana has heightened by interest in the conservation of natural resources and I want to tell you about the trouble the osprey are having on my lake. For the nonornithologists among you, the osprey is a beautiful large hawk, rather rare, that lives and nests near bodies of fresh water, lives on fish, and catches them with great skill. His numbers on Flathead Lake have been drastically reduced the past few years, and the reason has been traced by scientists at the University of Montana Biological Station to the presence of DDT in the embryos. Most of the eggs fail to hatch. The insecticide is used by farmers miles away and washes into the river upstream, flows into the lake, is taken up and concentrated in the aquatic food chains from microorganisms through fish to birds and mammals, undoubtedly including man. The fate of the osprey is saddening to nature lovers. But more important, it is another signal that man is creating an environment hostile to many forms of life. By knowing what is going on through observation and research it is perfectly clear what has to be done not only to save the osprey but to prevent even greater catastrophes.

Warning Signals

For years now, we have been given warning signals that something is seriously wrong with the environment in which great numbers of our children are being born and growing up. The signals range from a stubbornly high infant mortality rate to the enormous numbers of children with achievement problems in school and our disaffected youth. And how have we in Maternal and Child Health been reacting to these signals?

Let us visualize what we might have done within the framework of our usual MCH activities if we had been called in to deal with the osprey problem. We would, no doubt, devote considerable time to calculate fetal and perinatal mortality rates for the osprey chicks, and make careful comparisons between the rates for our lake and those located far

away. We would arrange multidisciplinary examinations for all the female osprey we could lure into traps, and for any chicks who managed to hatch and fall from their nests. The team would be headed by a qualified veterinarian specializing in wild birds, and we would note if there were any serious flight problems in the surviving young birds that need corrective care, and the extent of their backwardness in learning to fish.

In general, we would become aware of the fact that things are not as they used to be around the lake. There is often smoke in the air, the water is not as clear, and the fishing not as good as it used to be. One has to expect a few changes with "Progress" and "Development." We would wish that "they," meaning the Chamber of Commerce, the sawmills, the farmers, the business interests, and the politicians would give greater consideration to the effects of their decisions on the natural beauty of the area. But most of us would not venture far up river, out of our own field, to find out what is going on and who makes the decisions that affect the whole area. And too few of us would stick our necks out on behalf of the osprey and the other creatures dependent upon the maintenance of an ecological balance.

I agree with the conclusions of Phillip Broughton in his provocative editorial which appeared in the August issue of this Journal.[1] He points out that the health professions—only he calls us the "sickness" professions — have exerted very little influence on the decisions—social, economic, and political—that are all important in determining the kinds of communities in which our people live, bear, and raise their children; decisions that determine the very nature and extent of many of our greatest public health problems. He says "like the nineteenth century family doctor, the health profession is called in after the patient is sick."

With these thoughts in mind, I considered some of the things I have learned since I was an MCH director many years ago, and what I would like to do if I had to do it all over again.

Some Basic Causes

I have indicated that I would involve myself to a much greater extent than I did during my first incarnation in real prevention. Prevention of the basic causes of reproductive deficiency—of lifetime neglect of health and nutrition, and of ignorance about health matters among the women and girls of my community. Prevention of all the conditions which interfere with children achieving their potentials for healthy growth and development — physically, emotionally, and intellectually.

This is much more complicated than figuring out the role of DDT on the food chain. We have very little precise knowledge about the nature of the relationships between poverty and health; about the pathways and mechanisms through which the various components of low socioeconomic status influence biological functionings and behavior. If I were to undertake another career in research, this is the area I would choose to study. But here I am considering what to do in the field of practice. A comparison of mortality and morbidity data for the highest 25 per cent and the lowest quarter of my population would probably show that, in general, the families at the upper end of the economic scale have higher levels of reproductive efficiency and lower mortality and morbidity rates than do those in the lowest economic group. Lacking more specific knowledge, my program would have to be based on the assumption that all measures that would result in better living standards among the poor families would contribute to improved maternal and child health. Therefore, I would concern myself with better housing, less

population density, better food, more stimulation to learning very early in life, better educational opportunities, as well as providing good health and medical care. I would think of these activities as ecological programing—an attempt to create an environment in which children could thrive. My role would be to interpret and constantly keep before the decision-makers, the needs of families with children; and I would need a great deal of help. Perhaps we could organize a sort of Sierra Club for the conservation of human resources.

This concern with prevention of the root causes would take me into unfamiliar territory way upstream from my office in the health department. But, hopefully, during my second round at a school of public health, the experience would prepare me far better for such activities than when I first got my public health degree. However, prepared or not, I would better devote my energies to these ends rather than go on and on fighting rear-guard actions. Setting up more and more clinics and special services to deal with an ever-increasing load of defects, deficits and disabilities of body, mind, and spirit may be necessary, but it would not be sufficiently challenging to me in my reincarnation.

If I inherited an ongoing program of traditional MCH activities, I would try to make some changes based on things I have learned—many of them in our Kauai Studies.

Maternal Health Services

Starting with maternal health services, I would reorganize and warm up the services in my jurisdiction. In our zeal to reduce the maternal mortality rate in the 1930's, we went all out for the notion that every pregnant woman should be seen regularly by a physician throughout pregnancy. We pushed for prenatal clinics—the institutionalized, bureaucratized and often dehumanized form of care for the poor. Blood pressures were taken; laboratory tests and gains in weight were recorded. Every woman was examined with a stethoscope. And it could be shown that women who faithfully attended prenatal clinics, or had private physician care, had better outcomes than the women who did not. Our biggest worry became—how to get all these other women in, the ones who seem to need it the most; those who have the most complications; who have repeated losses; and small weak babies who die in a few days, weeks, or months, and keep our infant mortality rates so disgracefully high. How to get them into our clinics? And if we get them in, would all these problems vanish? It is doubtful, because only a part of these women's problems are amenable to even the most skillful care and advice applied during a few weeks while they are pregnant.

A lifetime of neglected health and nutrition calls for rehabilitation, most of which is best carried out between pregnancies. I would, therefore, work hard to get these women into intensive medical and supportive care. Prenatal medical care services and interpregnancy care then would concentrate on high priority patients. For the great majority of women, general health supervision, supportive care, and an occasional medical examination will suffice. As a part of general health supervision, I would attempt to get the doctors to take a more positive attitude about good dietary habits and to cease their efforts to restrict gains in weight to unphysiological levels. Indeed, there are those who are suggesting that the preoccupation of American physicians with limiting weight gains during pregnancy, together with prevailing dietary attitudes on the part of the women, may be contributing to our continuing high incidence of low birth-weight babies.[2] The evidence appears quite clear that there are strong, positive associations between

maternal gain in weight during pregnancy and birth weight, and also between prepregnancy weight and birth weight.[3,4] Dr. Nicholson Eastman proposes that failure to gain a normal amount constitutes grounds for placing some women in the high-risk category.[4]

In addition to possible adverse effects on the growth of the fetus, the terrorization of the mother over gaining weight is unlikely to contribute to her emotional health. As I poured over the recorded interviews of the expectant mothers in the Kauai Pregnancy Study, I was struck by the apparent eagerness of the women to talk to someone who appeared to be really interested in them, in their questions, their little and big anxieties, their feelings. In the beginning, we felt apologetic about making home visits every few weeks, asking the women to answer a long list of our questions and to talk freely about themselves, but we need not have been. Later on, some of my graduate students, who had developed a formidable interview schedule for use in home interviews of high-risk mothers, reported that contrary to my predictions, the mothers were quite receptive to the idea. One woman who had had repeated pregnancy losses said "I didn't know anyone at the hospital was this interested in me; no one ever talked with me before."

Perhaps quiet, home interviews of all women are not feasible, but surely there should be someone in the prenatal clinic with the good warm blood of human kindness in her veins whose primary job would be to lend a sympathetic ear, say a few kind words, and give a little TLC. This might prove to be one of the most important ingredients in maternity care. In terms of the behavior of the patients, in improved feelings of personal worth, and in attitudes toward the coming baby, this warm, supportive care could be most rewarding. And the warming-up process, of course, needs to extend to care in the hospital during labor, delivery, and the postpartum period.

I am looking to nurse-midwifery to bring greatly needed improvements to maternity and newborn care in this country. I believe it will come into its own eventually. Our shortage of physicians will make it imperative. And let us hope our midwives are wise enough to place as high a priority on the art of their profession as on the science.

Better Hospital Service

I would work much more closely with the hospital in my community to help them do a better job in their functions that affect the public health. The time has come when the hospital should be given the responsibility of providing birth and death certificates. The present laws and customs originated in the days when the individual doctor, alone, officiated at births and deaths. He was the only source of information. Hospital records also contain what we need to know about congenital defects and birth injuries in the newborn if our Crippled Children's Services are to be effective in early case finding and prompt care. In the Kauai Study we found that of all the congenital defects identified when our study children were two years old, two-thirds had already been recognized by the attending physician and recorded in the newborn record or in his office records; less than a third were reported on the birth certificates.[5] Some of the time, effort, and funds now spent on processing poor data might better be devoted to working out plans with hospitals and practicing physicians to get better data, and for feedback to them so they can see some direct benefit to themselves.

Screening Examinations for Children

Turning to child health, I would work hard to see that every—and I

mean *every*—child in my community had at least one good medical and developmental screening examination in early childhood. Of course, comprehensive continuous health supervision from infancy would continue to be the goal; but after all these many years we are still far from attaining it. Witness the findings of the medical examinations of Head Start children! So I would make a gigantic effort to reach every child at least once before it was too late to institute some secondary preventive measures. Careful hearing and vision screening would be included in this examination, as would an appraisal of physical and mental development. The results could be tremendous in providing a specific focus for immunizations, early corrective medical and health services, and the possible prevention of crippling behavior and learning problems.

Of all the children in our study, who at ten years of age were found to be suffering from physical or mental handicaps severe enough to interfere with their progress in school, the overwhelming majority were identified in the screening examination provided at age two.[6] There is no excuse for us in this country to continue to allow enormous numbers of our children to reach school age with impaired health and nutritional status, emotional problems, and learning difficulties. I visualize this as a community-wide effort supported by the professions, schools, voluntary, and social agencies—with a centralized, computerized record system which would facilitate follow-up and get the necessary services organized and delivered.

Dealing with medical and health problems would be a small part of what the community needs to do for its children. From the ten-year follow-up of our Kauai children, we found that five times more children were having serious achievement problems in school than were suffering from health problems requiring medical care.[6] What can be done to identify these children early, and what might be done to prevent their drift into school failure? We found that the great majority of the poor achievers at age ten were considered to be within the range of normal intelligence at two years, and very few of them had shown any evidence of perinatal stress or any form of reproductive casualty at birth.[7] But there was a high association with low socioeconomic status of the family, low levels of educational stimulation in the home, and of emotional support. We therefore concluded that these children were in fact "environmental casualties," with the influence of a deprived environment already becoming apparent by age two; and that the real prevention of the majority of achievement problems must begin very early in life.

I would work with others in the community to establish day care centers for infants and young children. Such centers would make it possible for all agencies that serve young children to pool their resources so as to provide continuity of physical and mental health services, as well as cultural and educational stimulation for the children and their parents. In addition, they would serve a useful role in providing skilled care for the young children of mothers who work outside the home—an ever-growing need which we have disregarded far too long. This might be one way to stem the tide of poor school achievement problems which are overwhelming our schools.

Conclusions

Of course, in tackling this ambitious program I would not be working alone, nor only within the confines of the health department and its personnel. I would have to work with physicians and hospital administrators, midwives (hopefully) and psychologists, social agency personnel, school administrators and teachers, and very importantly with business men and the politicians in City

Hall. We would have some trouble understanding one another and trusting one another. Most of us in our professional education have been taught to see and to consider important only the things we have been prepared to do. We have become locked into the viewpoint of our particular specialties. There is practically no problem of any consequence any more that can be dealt with effectively by any of us who work alone. There is much talk and some practice of what is called the multidisciplinary approach to problems these days. But just because members of several disciplines are brought together does not necessarily mean very much. They sometimes remind me of two-year-olds playing together. It is really parallel play rather than any real communication or learning from one another. Our professional schools should be teaching us to play together at least at the three and a half-year level!

So, with these thoughts in mind, I would probably go back into teaching again. And I would try to learn with my students the difficult job of working up stream on the most important of all jobs facing America—how to provide fit communities for our children.

REFERENCES

1. Editorial. The Valley of Decision. A.J.P.H. 58:1317 (Aug.), 1968.
2. Niswander, K. R.; Singer, J.; Westphal, M.; and Weiss, M. Studies of Weight Gain During Pregnancy and Prepregnancy Weight. 1. Their Association with Birth Weight for Women of Term Gestation. (To be published in Obstetrics and Gynecology.)
3. Singer, J. E.; Westphal, M.; and Niswander, K. Relationship of Weight Gain During Pregnancy to Birth Weight and Infant Growth and Development in the First Year of Life. Obs. & Gynec. 31:417, 1968.
4. Eastman, N. J., and Jackson, E. The Bearing of Maternal Weight Gain and Pre-Pregnancy Weight on Birth Weight in Full Term Pregnancies. Obst. & Gynec. Surv. 23:1003–1025, 1968.
5. Bierman, J. M.; Siegel, E.; French, F. E.; and Connor, A. Community Impact of Handicaps of Prenatal or Natal Origin. Pub. Health Rep. 78:839 (Oct.), 1963.
6. French, F. E.; Connor, A.; Bierman, J. M.; Simonian, K. R.; and Smith, R. S. Congenital and Acquired Handicaps of Ten-Year-Olds—Report of a Follow-up Study, Kauai, Hawaii. A.J.P.H. 58:1388 (Aug.), 1968.
7. Werner, E.; Bierman, J. M.; French, F. E.; Simonian, K.; Connor, A.; Smith, R. S.; and Campbell, M. Reproductive and Environmental Casualties: Report of 10-Year Follow-up Study. Pediatrics 42:112 (July), 1968.

Dr. Bierman is Executive Director, Committee on Maternal Nutrition, National Research Council (2101 Constitution Ave.), Washington, D. C. 20418

The Martha Mary Eliot Award Lecture was given before the Maternal and Child Health Section of the American Public Health Association at the Ninety-Sixth Annual Meeting in Detroit, Mich., November 12, 1968.