

There's no use running if you're on the wrong road.

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Environmental health capacity building occurs in a variety of ways. Among this audience, most of you know the saga of my friend Herb Dunsmore, an outstanding Public Health Engineer, who was Environmental Health Director for Allegheny Co. a half century ago. Herb recounted to me how he lined up the early day sanitary police, placed a barrel on each side of the line, and had them place their revolvers in one barrel and their badges in another. That was essential capacity building.

About the same era, I was appointed Chief Sanitarian in a municipal health department that was rudderless and rife with incompetence and dishonesty. Sanitary inspectors recommended products during their rounds, only to return after hours to sell the products to operators. Inspection fees collected on site never got to the City Treasurer. Many employees gathered for morning coffee, and then returned to their own businesses and were not seen again until the next morning. Mileage for the use of personal autos magically approximated the amount needed for personal monthly auto payments. The Department Director would not take action as he was of the same ilk. It was a lonely existence for a young public health professional fresh out of a school of public health and full of grand ideas. I commenced mandatory training courses all day Fridays, and this affront caused a number of the most incompetent to resign. It took somewhat longer to rid the department of all the others and replace them with qualified,

motivated personnel. Some of this occurred only after I became Department Director. This was also essential capacity building that is no longer relevant or useful in textbooks or in the content of workshops such as this except for historical amusement.

However, I did not come here to spend time on the past, as it is much more productive to consider issues associated with the future of environmental health.

It is often forgotten that the practice of environmental health is an art as well a science. Today, I will discuss a few aspects of the art, rather than the science, of environmental health capacity building. I will address those who desire to look to the future, lead and change the status quo rather than play “follow the leader” as many are content to do. Many appear content to utilize the cookie cutter approach, and few appear to think outside the prescribed box.

I have articulated some of my thoughts a number of times. But as Albert Schweitzer noted, *“No ray of sunshine is ever lost, but the green which it awakes into existence needs time to sprout, and is not always granted to the sower to see the harvest. All that is worth anything is done in faith.”* Many of us, therefore, continue with patience and faith.

Your capacities as practitioners are basic to your performance and your careers, as well as future of environmental health. It is essential that you have capacity for **vision**, capacity to develop **competencies**, capacity to understand **risk**, capacity to build **bridges of communication**, capacity in **public relations**, capacity to achieve **top leadership positions** in a variety of public and private agencies, and capacity to understand and **market the benefits of environmental health**. If you build such capacities, the future of environmental health will be in good hands.

I commenced my career as a local sanitarian and am proud of having served as a county sanitarian, a district sanitarian, the state food sanitarian, and the chief sanitarian in a metropolitan health department. These positions were rewarding experiences and

precursors to a public service journey of promotions and appointments to a dozen managerial and policy roles in official and voluntary organizations, as well as in academia. But I am only one of numerous environmental health practitioners who have taken advantage of opportunities to earn top positions in the public and private sectors as well as in academia. Experience as an environmental health practitioner is an excellent route to pursue a variety of managerial and policy roles in the broad and complex field of environmental health, as well as in the parental field of public health. Environmental health practitioners have earned positions as state health directors, state environmental directors, state cabinet secretaries, state laboratory directors, deans of schools of public health, high level officials in the departments of defense and energy, as well as admirals and other important professionals in the U.S. Public Health Service. These achievers have clearly demonstrated the opportunities available to those who have the necessary capacity.

Environmental health practitioners not only manage a wide variety of environmental health problems, but **should** also be involved in epidemiology, risk assessment, risk communication, risk management, public relations, community planning, regulation, policy development, technical reports, sampling and surveillance, analyses and interpretation of analyses, developing priorities, program design and evaluation, and administration.

Now, let's turn our attention to a few of the areas in which practitioners need to build capacity. These include:

- The capacity to exhibit positive attitudes and actions, rather than bemoaning **perceived** negatives.
- The capacity to understand and embrace the **comprehensive** field of environmental health
- The capacity to develop that **special attribute**, the gift of vision
- The capacity to convert vision into reality through **leadership**
- The capacity to practice good **public relations**
- The capacity to **market** your services

- The capacity to **plan for environmental health**
- The capacity to embrace **ecological** issues
- The capacity to **assess, communicate, and manage risk**
- The capacity to build and travel **bridges of communication**, and
- The capacity to prepare for the **future of environmental health**.

Now, we will discuss the foregoing in more detail. First,

CAPACITY FOR POSITIVE ATTITUDES

I hear “woe is me” from many environmental health practitioners who **choose** to perceive that their glasses are half-empty rather than half-full. Some proclaim they “get no respect,” they moan their negativism in publications and at various conferences, they engage in the blame game, and they ignore their individual responsibilities for problem solving. Many practitioners believe that some "magic bullet" such as recognition through certification, registration or licensure is an answer. Such recognition is professionally satisfying, but is not an answer to perceived woes. Elected officials and other policy officials are seldom impressed by such measures. Many feel an infusion of federal funding granted without regard for merit is necessary, but this is not an answer. Many believe that talking to each other is doing something, and that someone else is going to lead the way and remedy their problems. However, as in the title of a popular country-western song, this syndrome is “*Looking for Love in All the Wrong Places*,” and is not an answer.

The “defeatist and blame someone else” attitude appears to have increased during this era in which environmental health is a high priority issue demanded by the public, demanded by political leaders, and widely considered to be an entitlement. Thankfully, numerous outstanding environmental health leaders have not fallen into the trap of defeatism and victimization, and continue to exhibit the capacity to earn recognition.

Many environmental health practitioners need to lift themselves out of their conventional mindsets. They are available, they want to serve, but they do not have clear

concepts of ensuring accomplishment and recognition. Many have not developed internal gyroscopes and do not understand who they are, or their potentials. When referring to our State Legislature, one Governor for whom I worked frequently quipped: *"Blessed are those who expect little for they shall not be disappointed."* Likewise, those environmental health practitioners who expect little will not be disappointed. Conversely, those who expect accomplishment and have the necessary capacity will not be disappointed.

CAPACITY TO EMBRACE THE COMPREHENSIVE FIELD OF ENVIRONMENTAL HEALTH

When I use the term environmental health, I use it to embrace the terms environmental health **and** environmental protection. Most environmental protection programs were originally administered by public health departments and were termed environmental health. Thomas Wolfe was correct when he wrote *"You Can't Go Home Again,"* and these words have direct applicability to the field of environmental health. The content and public health goal of those programs now commonly termed environmental protection did not change with their assignment to other agencies. For more than thirty years, many public health leaders have been shooting themselves in their collective foot by proclaiming environmental protection as something different and apart, rather than fully embracing and leading environmental health **and** protection efforts. Instead of following the suggestion *"When you leave me, I'll go with you,"* many public health leaders opted for *"Sleeping Single in a Double Bed."* This dichotomy has resulted in creating organizational barriers rather than effective bridges of understanding and cooperation. This has proven that *"Our Marriage Was A Failure, But Our Divorce Ain't Working Either."*

The problem of identification continues to plague environmental health practitioners. Many environmental health practitioners believe that opportunities begin and end within the scope of their own organizations, and definitions of environmental health vary accordingly. Instead of defining broadly and embracing the **comprehensive**

field and associated opportunities, they misguidedly define narrowly and develop **organizational and mental barriers** by believing that environmental health practice is limited to health departments rather than the **challenging spectrum** of public and private entities involved. Opportunities for careers and leadership abound in a diverse assortment of organizations at the local, state and federal levels, as well as in academia and the private sector. Another song title may be instructive: *"I Don't Know What It Is, but I Sure Miss It When It's Gone."*

Various federal, state and local environmental health organizations continue to define and redefine to the detriment of a clear, consistent, comprehensive and marketable understanding of environmental health. The **"Committee on the Future of Environmental Health"** recommended a comprehensive approach designed to embrace the field of practice. This Committee, following widespread input and peer review from such groups as NEHA, CDC, NCEH, APHA, HRSA, EPA, ATSDR, ASPH, NCLEHA, various state and local health departments, ASTHO, NACCHO and others -----, defined Environmental Health as follows:

Environmental health is the art and science of protecting against environmental factors that may adversely impact human health or the ecological balances essential to long-term human health and environmental quality. Such factors include, but are not limited to: air, food and water contaminants; radiation; toxic chemicals; disease vectors; safety hazards; and habitat alterations.

In the absence of this widely referenced and accepted definition, practitioners do not know if they are marketing **a buggy whip or a rocket ship**. Environmental health must be consistently marketed in an organized fashion to ensure the understanding and support of the public, including the media, civic leaders and elected officials. Environmental health is **valuable**, environmental health is **essential**, and environmental health is **marketable**. We should coin a slogan for environmental health such as: **"Environmental Health: You can't live without it."** This should be on environmental health agency letterheads, documents, leaflets, reports and bumper stickers.

A few facts regarding the size and complexity of the field of environmental health practice are important to understand:

1. First, environmental health is a high priority issue in our society. It is demanded by the public, the media and political leaders, and is widely considered to be an entitlement. Practitioners must take advantage of the magnitude and societal importance of their field of practice.
2. Secondly, environmental health is a profoundly complex, multifaceted, multidisciplinary and interdisciplinary field of practice engaged in by scores of disciplines and professions within a broad array of public and private organizations.
3. Thirdly, 90 to 95% of state level environmental health activities are assigned to agencies other than health departments, and there is a similar trend at the local level.
4. And finally, at the state levels, environmental health expenditures and numbers of personnel account for roughly 50% of the field of public health practice and is, therefore, the largest single component of the field of public health.

The foregoing facts signify numerous opportunities for environmental health practitioners. The opportunities are particularly outstanding for individuals having the capacity and desire to engage in policy and top management roles in the varied and complex spectrum of public and private agencies having environmental health responsibilities. Necessary changes are made at policy levels. Most practitioners, however, apparently feel more comfortable and competent in technical roles than in managerial and policy roles.

Regrettably, many uninformed individuals in the public health establishment tend to view environmental health as a minor and frequently controversial single activity, instead of a major spectrum of essential programs of community and indoor air quality, food protection, water supply, solid and hazardous wastes, toxic chemicals, housing hygiene, water pollution control, industrial hygiene, ionizing radiation, land use planning and

vector control.

CAPACITY TO ARTICULATE AND PURSUE A COMPREHENSIVE VISION

When I consider a vision for environmental health, I am reminded to the title of another country/western song: *“I’m going someplace I hope I find.”*

The articulated community environmental health vision statements I have reviewed from scores of agencies vary widely from no concept, through a meaningless short sentence such as “Healthy People in Healthy Communities,” to a few well developed statements. Some acknowledge only a fragment or the tantalizing rainbow-like spectrum of a vision. This remarkable variation is due to lack of a common understanding of the field of practice, as well as a paucity of imagination on the part of many individuals in managerial roles.

The following quote from Alice in Wonderland is instructive for all of us regarding the need for a vision:

“Would you tell me, please, which way I ought to go from here?” asked Alice.

“That depends a good deal on where you want to get to,” said the cat.

“I don’t much care where,” said Alice.

“Then it doesn’t matter which way you go,” said the cat.

As we consider elements of a vision for environmental health, it may be that, like Alice, many practitioners don’t care where they go. For them, it certainly doesn’t matter whether they have a vision or not.

Every practitioner should be an active participant in developing and pursuing a meaningful vision for community environmental health that should be more than blurred imagination.

- You **should** envision communities in which environmental health measures contribute substantially to preventing disease and disability, as well as reducing health care costs.
- You **should** envision communities in which the public considers environmental health to be an important entitlement for the common good.

- You **should** envision communities in which environmental health problems are measured and defined **prior** to designing and implementing programs.
- You **should** envision communities in which environmental health is based on sound risk assessment and epidemiology, as well as the primacy of prevention.
- You **should** envision communities in which ecological considerations are embraced as components of environmental health because, in the long run, a deteriorating environment is a threat to public health and the economy.
- You **should** envision communities in which citizens understand that a quality environment is an important factor in sound economic vitality.
- You **should** envision communities in which environmental health outcomes contribute to minimizing social problems.
- You **should** envision communities in which the quality of the environment contributes positively to educational achievement.
- You **should** envision communities in which the quality of life is enhanced by effective environmental health services.
- You **should** envision communities in which environmental health practitioners have the capacity to effectively address community environmental health problems.
- You **should** envision communities in which the public, the media, and public policy makers constantly travel broad two-way environmental health communication bridges.
- You **should** envision communities in which public and private sector officials seek the input of environmental health practitioners **prior** to developing policy and taking actions that impact environmental health.

If environmental health practitioners and community leaders embrace the foregoing as components of a vision for environmental health, then environmental health policy, environmental health goals, environmental health objectives, environmental health program design and environmental health priorities will be developed to achieve the vision.

Developing and pursuing a vision is a continuing journey rather than a destination. It is not a single step exercise for a staff meeting or retreat.

CAPACITY TO CONVERT VISION INTO REALITY THROUGH LEADERSHIP

Many outstanding environmental health leaders consistently exhibit the capacity to earn recognition by their peers, recognition by the public and private sectors, and respect and recognition by public policy leaders and elected officials. However, many others are content to simply complain. So what leadership traits are necessary to convert vision into reality?

Here are a few traits practiced by scores of real environmental health leaders:

- They constantly pursue that coherent vision that provides a platform on which to base and market their mission, their goals, their objectives, their programs and their policy recommendations.
- They have the capacity and are confident in applying their knowledge, skills, and abilities.
- They have the commitment to change the status quo.
- They stand up for their beliefs, they practice persistence and resilience, and they accept the fact that if you want a place in the sun you have to expect a few blisters.
- They engage in controversial issues as appropriate, and realize that trying to please everyone is a key to failure.
- They do not rely on someone else to solve their problems.
- They are the change agents they want to see.
- They recognize that while talking to each other may be satisfying, it is not a solution to inadequate achievement and recognition.
- They understand and impact the political process, rather than viewing it with disdain.
- They lead in developing public policy, rather than simply following and reacting.
- They seek to be accountable by developing and striving for measurable outcomes.
- They consistently market the benefits of environmental health that include:

- reduced disease and disability,
 - lower health care costs,
 - enhanced community economic vitality,
 - enhanced productivity,
 - enhanced community educational achievement,
 - fewer social problems, and
 - enhanced quality of life in a more livable environment.
- They routinely utilize the complex array of essential public information, networking and marketing possibilities to ensure support.
 - They do not blame someone else for their perceived problems. They look **inward** for solutions!
 - They understand that professionalism is in the eye of the beholder and must be derived from achievement and resultant recognition by peers, subordinates, the public, and public policy leaders.
 - They take the “*The Road Less Traveled.*” They think **outside** the box, they are willing to be out of step with their peers, and they realize that loyalty to a petrified opinion never broke a chain or freed a human soul. And finally,
 - They understand that support and recognition must be achieved the old fashioned way: **They Earn It!**

Effective environmental health leadership is profoundly complex, frequently controversial, and is invariably the result of individual capacity and initiatives. Many of our great environmental health leaders have been dedicated individuals who achieved eminence not because they wore the right labels or belonged to the right organization, but because they had the right ideas, the right information and the right leadership at the right time. The mantle of leadership falls to those who earn it, and belongs to no group by divine right.

Leadership continues to be a prominent challenge. Environmental health leaders must take the lead in making it all happen! Otherwise, we are simply talking to each other, and believing that talking to each other is accomplishing something. Do not

assume that others will address the challenges of your field of practice. Leadership depends on individual environmental health practitioners fulfilling their responsibilities.

As noted previously, environmental health practitioners have a solid record of achievement in a wide spectrum of roles in a variety of public, private and academic organizations. But many environmental health practitioners appear reluctant to engage in the controversies inherent in policy and management roles. Most top management positions do not offer career protection beyond the ability of an individual to earn the respect and support of peers, subordinates, the public, the media and elected officials.

Leadership on the road to improved environmental health is not an easy route. Leadership requires **vision**, leadership requires **competence**, and leadership requires **commitment**. Remember that only **dead** fish move **with** the current.

CAPACITY TO PRACTICE POSITIVE PUBLIC RELATIONS

Abraham Lincoln stated that:

“Public sentiment is everything, with it nothing can fail, without it nothing can succeed. He who molds public sentiment goes deeper than he who enacts statutes or pronounces decisions. He makes statutes or decisions possible or impossible to execute.”

Some environmental health practitioners disdain public relations, as well as the person whose role is to enhance public understanding of the agency. They fail to realize that everything they do and the manner in which they do it is public relations and that each individual is responsible for the agency’s positive or negative image. Public relations encompass everything that creates an impression of the practitioner, the agency and the activities. The impression is created through the manner in which practitioners conduct their affairs, through their appearances, through their interpersonal relations, through their competence and vision, through their attitudes and openness, and through all of their actions.

Environmental health is the **public's** business, and will not be properly understood or supported in the absence of **continuing** public information to the news media, target groups, citizen groups, professional groups, elected officials, and other agencies involved in the field of environmental health.

News media receive uncounted numbers of "canned" news releases, and these frequently go unnoticed. The **personal** touch is much more effective. Everything in an official agency should be open to the media unless specifically legally prohibited. Be honest and be open. Make frequent contact with the reporters covering your agency or functions. Go out of your way to impart information. Develop a calendar or timely seasonal information items. Have a cup of coffee with the reporter. Tell the reporter of your needs and problems as well as your successes. Encourage qualified personnel at all levels to impart information within their spheres of responsibility. For major issues, request a meeting with news editors to gain editorial understanding and support. Do these things routinely and develop sound media relationships rather than expecting immediate support during an unforeseen emergency.

And practice public relations with your elected officials. Again, many practitioners disdain what they consider "politics," but outreach to politicians helps them to understand and meet the needs of their constituents. A few recommendations: Meet elected officials in person. Give them tours of their districts pointing out environmental health problems that you have impacted or still need to solve. Create maps of their jurisdictions indicating the locations of environmental health problems.

I continue to hear about the "invisible profession." As a long time practitioner, I find this invisibility **unbelievable**. If a given program or agency is "invisible," practitioners should re-evaluate their own attitudes and efforts. The fault is invariably with the **messengers** rather than the **messages**. For years, my various agencies were extremely visible. We had TV, radio and print media messages emanating from a variety of departmental personnel several times weekly. Environmental health is of profound interest to the public. Do not blame the media!

And, do not hide **your** lights under a bushel!

CAPACITY TO MARKET YOUR SERVICES

Machiavelli wrote that, *"All armed prophets have been victorious, and all unarmed prophets have been destroyed."*

Marketing and marketing research are environmental health armaments that have not been effectively utilized for the field of environmental health. Many practitioners view marketing and market research tools with disdain. Many confuse marketing with public relations. News releases, pamphlets, leaflets, media appearances and other similar tools are valuable, but are not marketing.

Effective marketing requires a working knowledge of the benefits of environmental health, as well as a comprehensive vision for environmental health.

A simple definition of marketing for the field of environmental health is:

The process of planning and executing the conception, the promotion, and the distribution of ideas and services that satisfy environmental health objectives.

However, marketing in the absence of prior **marketing research** usually results in an expensive and ineffective shotgun approach rather than a targeted effective approach. It is implementation without planning.

Marketing research is the function that links the public to the marketer through information designed to identify and define marketing opportunities and problems; that generates, refines and evaluates marketing actions; and that improves marketing as a process.

I repeat that environmental health is **valuable**, environmental health is **essential** and environmental health is **marketable**. But effective marketing research and marketing have not been conducted for the field of environmental health. The **market** has not been

analyzed and understood, and **marketing efforts** have been launched with no defined targets in sight and have failed to reach and effectively impact the market.

Marketing research is widely utilized by the private sector, but has been ignored as an essential tool to achieve the objectives of environmental health.

Agencies such as the NCEH and EPA should cooperatively develop a national marketing strategy that will be an effective tool for state and local environmental health agencies.

CAPACITY TO ENSURE AN APPROPRIATE TERRORISM ROLE

Our Nation's environmental health workforce varies tremendously in competencies to effectively address potential terrorism issues. This large and important public health workforce should be in a position to play a key role in preventing and responding to terrorism events. Currently, most disaster preparedness plans suggest limited roles for environmental health and place practitioners in support roles for other public health functions and even for health care.

Environmental health practitioners have skills, competencies and legal responsibilities to routinely address vital health and safety problems related to water supply, toxic chemicals, hazardous wastes, water pollution, disease vectors, food safety, community air pollution, indoor air quality, industrial health and safety, and ionizing radiation. However, with few exceptions, these environmental health practitioners would be in disarray or ignored in the event of a terrorism episode. This lack of role definition and defined competencies and training for environmental health practitioners for terrorism preparedness constitutes a disservice to our nation's public health efforts and citizens.

Strong bridges of cooperation linking the scores of agencies delivering environmental health programs at the local, state and federal levels should be developed to ensure a comprehensive environmental health approach to terrorism prevention and

response.

CAPACITY TO EMBRACE ECOLOGICAL ISSUES

Environmental health programs have traditionally been justified, designed, and administered based on a public health rationale. As environmental problems, priorities, public and political perception, public involvement, goals, and public policy have evolved; ecological considerations have become increasingly important. Whatever long-term health threats exist, the public and public policy leaders know that pollution kills fish, limits visibility, creates foul stench, ruins lakes and rivers, degrades recreational areas, and endangers plant and animal life. Environmental health practitioners must develop the capacity to embrace ecological issues as precursors to health problems. They must understand that ecological changes are previews of incipient public health problems. Failure to embrace ecological components has been among the reasons many environmental health responsibilities have been assigned to agencies other than health departments.

The U.S. Environmental Protection Agency's Science Advisory Board stated that:
... there is no doubt that over time the quality of human life declines as the quality of natural ecosystems declines ... over the past 20 years and especially over the past decade, EPA has paid too little attention to natural ecosystems. The Agency has considered the protection of public health to be its primary mission, and it has been less concerned about risks posed to ecosystems... EPA's response to human health risks as compared to ecological risks is inappropriate, because, in the real world, there is little distinction between the two. Over the long term, ecological degradation either directly or indirectly degrades human health and the economy... human health and welfare ultimately rely upon the life support systems and natural resources provided by healthy ecosystems.

Except for the voices of a few leaders, environmental health input is noticeably absent in the current debates over such global issues as ozone depletion, global warming, population pressures, global toxification, desertification, and

deforestation, all of which pose threats to human health and world ecology. Environmental health leaders need to be prepared to be constructively involved in the planning to counter such global threats to our delicate ecological system.

CAPACITY TO ASSESS, COMMUNICATE, AND MANAGE RISK

Everything in the practice of environmental health is based on risk ---- risk assessment, risk communication, and risk management involving one or more environmental health problems. The issue of how risk is assessed, communicated and managed is among the most critical environmental health problems faced by society. Public perception drives the actions of elected officials. However, public perception of environmental health priorities and problems frequently differs from that of environmental health practitioners.

Considering the serious differences in perceived priorities between scientists and those of the public and political leaders, risk assessment must be considered an environmental health tool to be utilized by all interests involved in protecting the health of the public and the quality of the environment. Utilizing sound scientific principles to **assess** risk is vital to **communicating** risk, **recommending** priorities, **designing and administering** risk management programs, **requesting** funds, and **evaluating** control efforts.

Risk assessment has always been utilized informally and even intuitively by public policy makers and environmental health practitioners. Risk assessment mathematical models have been comparatively recent developments. Whenever a decision or recommendation has been made to develop a policy or manage an environmental problem based on available information, a risk assessment has been performed.

Frequently, environmental health practitioners must make emergency decisions based on incomplete but compelling information without having the luxury of waiting until incontrovertible evidence is available. This practice is performed daily by

environmental health practitioners charged with managing such risks as food, water, air, radiation, toxics, noise, and unintentional injuries.

Risk communication ranks high among the more significant environmental health capacity needs. Risk assessment is merely academic in the absence of continuing effective risk communication with the general public, with various interest groups, with public and private organizations, and with public policy officials. Many practitioners continue to view risk communication as a one-way process composed of official pronouncements, advisories, letters, leaflets, booklets, and other such materials. As a group, environmental health practitioners have been particularly inadequate as risk communicators.

Effective risk communication requires complete openness throughout the process, and requires the involvement of the public as actions are being planned, rather than after the fact. Lack of risk communication results in priorities and policies that differ considerably from those based on sound environmental health science.

Effective risk communication requires a continuing relationship between practitioners and the public even in the absence of a crisis. Risk communication on a single-issue crisis basis is usually less than optimal.

The environment and the health of the public will be best served by prioritizing problems based on the best of risk assessment measures and experienced professional judgment, coupled with effective risk communication and risk management.

CAPACITY TO PLAN FOR ENVIRONMENTAL HEALTH

Planning for environmental health (as differed from program planning) is a fundamental prevention function. Environmental health should be grounded in prevention, but a preponderance of efforts and funds are currently devoted to remediation of problems created as a result of earlier actions taken by other interests in the public and private sectors. Environmental health practitioners must have the capacity to become

effectively involved in prevention during the planning, design and construction stages of:

- energy development and production,
- land use,
- transportation methods and systems,
- facilities,
- resource development and utilization, and
- product design and development.

Developing the capacity and the **authority** to function effectively in planning for environmental health is necessary for environmental health practitioners to function in a primary prevention mode, rather than secondary prevention or treatment of the environment after the contamination or pollution has been produced and emitted.

CAPACITY TO CONSTRUCT AND TRAVEL COMMUNICATION BRIDGES

Environmental health practitioners must develop and constantly travel bridges of communication and cooperation connecting a wide variety of groups and agencies involved in the struggle for a quality environment and enhanced public health. A few such interests include land use, energy production, transportation, resource development, health care, public works, agriculture, conservation, engineering, architecture, colleges and universities, economic development, chambers of commerce, advocacy groups, trade and industry groups, and elected officials. These relationships should be dictated by organizational policy, rather than being left to chance or the ever-changing parade of personalities.

CAPACITY TO EDUCATE ENVIRONMENTAL HEALTH LEADERS

Interest in the quality of our environment and related public health implications has never been more intense. Political leaders, whether liberal, moderate, or conservative, know that they must at least profess to provide leadership for a wide variety of environmental health issues.

The United States is spending billions of dollars to manage and clean up our environment, but there are not nearly enough well qualified practitioners to implement these programs. This personnel shortage is serious. It could very well lead to a worsening of the present crisis in spite of the money being spent.

It is no longer a question of *whether* our environment will be managed, but rather *how* and by *whom*. The *by whom* is at least as important as the *how*, since the priorities and methodologies of the *how* are largely determined by the nature and quality of the environmental health workforce.

Schools of Public Health have not perceived the environmental health workforce as a priority or as their responsibility for the past 20 years. To paraphrase Robert Frost, "*Two roads diverged in a wood,*" and schools of public health followed the money trail that lead toward health care and basic science research rather than the field of environmental health practice, "*and that has made all the difference.*"

This abrogation of leadership for educating environmental health practitioners has contributed to the widespread deficits of properly trained environmental health personnel. Environmental activists without public health training are exerting greater influence on environmental health policies and priorities than the public health community. Individuals with little knowledge of epidemiology, biostatistics, toxicology, and risk assessment are filling key environmental health agency positions that require such knowledge.

The Bureau of Health Professions concluded that there are shortages of environmental health personnel in nearly every category, and that only 11 percent have formal education in public health. (Parenthetically, I believe the figure is closer to 5 percent).

Some of today's environmental health practitioners are being trained in accredited environmental health programs outside schools of public health, but the

vast majority are products of other disciplines and professions such as geology, chemistry, biology, law, administration, political science, social science, and economics. While these latter practitioners do not have capacity in the basic public health sciences, they are nonetheless essential partners in the struggle for a healthy environment.

The environmental health workforce requires a spectrum of practitioners ranging from sub-baccalaureate surveillance and inspectional personnel through masters and doctoral levels. Most leadership positions will continue to be filled by individuals possessing graduate academic credentials.

Accredited schools and programs are not adequately addressing the need and potential market for undergraduate or graduate practitioners. Environmental health policies and priorities are the responsibility of those engaged at the more rarified administrative and policy levels of the public and private sector. Until such personnel are made available by our nation's schools of public health and environmental health science and protection programs, most leadership and policy positions will continue to be filled by individuals possessing other credentials. Schools of public health, once the prime incubators for public health practitioners, have gravitated away from developing environmental health practitioners as they follow the money trail toward emphasizing basic science research and health care rather than public health practice. Courses in health law are usually health care law, courses in health administration are usually health care administration, courses in health policy are usually health care policy, and courses in health financing and economics are usually health care financing and economics. Competencies necessary for the field of environmental health **practice** have not been an important consideration, and course content in environmental health finance, environmental health policy, environmental health law, and environmental health administration, as well as a philosophy and vision of environmental health is somewhere between rare and non-existent.

Most environmental health faculty members in schools of public health are basic science researchers rather than academically qualified generalists or practitioners. This change is reflected by the type of graduates, their competencies, and the nature of their careers. Academicians become mentors and role models, and most schools of public health are not providing role models and mentors for those who might otherwise enter the field of practice rather than teaching and research.

Accreditation criteria of the National Environmental Health Science and Protection Accreditation Council are more relevant to the field of practice than are those of the Council on Education for Public Health, the accrediting agency for schools of public health. Undergraduates produced by accredited environmental health programs generally have the capacity needed for practice at the entrance and journeyman levels. Unfortunately, there are only three accredited environmental health graduate programs.

In the early 90's, the Captain Barry Stern of the USPHS Bureau of Health Professions funded the Association of Schools of Public Health to develop a report regarding the educational needs of environmental health practitioners. ASPH contracted with me to actually write the report that was titled "*Year 2000 Education Plan for Environmental Health Science and Protection Professionals.*" The final report included draft legislation designed to significantly increase funding for accredited schools and programs educating environmental health graduate and undergraduate practitioners. I was unable to garner support from any of the major national groups such as ASPH, APHA, NEHA, ASTHO or NACCHO. It is now another dust covered report.

And we are now faced with a personnel crisis. The leadership workforce is aging and the pool of professional environmental health replacements is inadequate in quantity. The leadership positions will be filled by personnel lacking training in the basic public health sciences thus creating a disservice to the public and the environment. It would now require years to develop the funding, facilities, and faculty to commence the necessary education. I have no illusions and see no hope for such action at this point. **The crisis that could have been averted is now playing out in slow motion.**

We should all wonder why institutions such as the Kennedy School at Harvard and scores of others rather than schools of public health and accredited environmental health programs are preparing students for environmental health policy and leadership roles.

CAPACITY FOR THE FUTURE OF ENVIRONMENTAL HEALTH

Environmental health will continue to increase in complexity, and the public will increasingly expect and demand effective services. Demographic changes, resource development and consumption, product and materials manufacturing and utilization, wastes, global environmental deterioration, technological development, international terrorism, changing patterns of land use, population pressures, transportation methodologies, energy development and utilization, and continuing organizational diversification of environmental health will create additional and unanticipated challenges and opportunities for those having the necessary capacities. Those who have the capacity to market the benefits of environmental health through leadership, relationships and creativity will transform the field.

Practitioners must understand that they are building castles rather than merely laying bricks. They must manage the environment utilizing a plethora of tools, rather than merely inspecting and reacting. Environmental health practitioners must have a vision, a philosophy, a comprehensive view of the field of practice, and understand and market the benefits of environmental health.

The future of environmental health is bright for those who have the capacity. There are many potholes in the course of protecting public health and environmental quality. The journey requires vision and steadfastness of purpose, as it is beset by difficult pressures, tempting comfortable detours, political surprises, and frequently offers no short-term gratification or pay-off. There are no rest stops along the way for those wishing to lead.

Environmental health will continue to be basic to the health of the public and the quality of our environment. Environmental health problems, programs, organizations and requisite practitioner capacities will evolve in ways that are as yet unforeseen. Anticipating and meeting the future of environmental health will ensure a bright future for those practitioners who have the necessary capacities.

And finally, I offer a few relevant quotes from Kent M. Keith's Paradoxical Commandments that many of you have heard. They are particularly appropriate for leaders.

If you are successful, you will win false friends and true enemies.
Succeed anyway.

Honesty and frankness make you vulnerable.
Be honest and frank anyway.

The biggest men and women with the biggest ideas can be shot down by the smallest men and women with the smallest minds.
Think big anyway.

People favor underdogs but follow only top dogs.
Fight for a few underdogs anyway.

What you spend years building may be destroyed overnight.
Build anyway.

People really need help but may attack you if you do help them.
Help people anyway.

Give the world the best you have and you'll get kicked in the teeth.
Give the world the best you have anyway.

