

was quite directly ^{from asking} ~~asked~~ that question. ^{When program began} ~~At the start~~, all the textbooks stated

that smallpox vaccination conferred immunity for no more than 3 to 5 years and so, ^{systematically} ~~we set out to~~ ^{actively} vaccinate or revaccinate the population of each of the endemic

countries. ^{initial} ~~The~~ results were excellent. ~~The~~ ^{being independent teams,} we documented ^{as we proceeded,} that we

were reaching 80% of the population. ~~With~~ There was a general mood of satisfaction.

There was just one ^{major} ~~problem~~ ^{problem}. ^{From the beginning} ~~We~~ ^{we} ~~thought~~ ^{we} ~~to~~ ^{to} set up a surveillance scheme.

to detect cases and to obtain ^{the} ~~to~~ ^{basic} ~~information~~ ^{about them.} ~~at the time.~~ One piece of information was whether

a case had ever before been vaccinated. ^{(Vaccines) early} ~~The~~ ^{findings} were puzzling. ^{Virtually none} ~~of~~

~~the~~ ^{cases} ~~had~~ a vaccine scar. ~~(See below)~~ ^{Yet,} if the vaccine were effective for only 3-5 years,

we should expect to see, in areas not yet systematically vaccinated, a number of cases in

adults who had ^{not} been vaccinated ^{for many years, perhaps since childhood.} There were almost no

such cases. We dispatched a special team to check this out in detail - and to our surprise - we

found vaccine efficacy ^{rather} ~~of~~ ^{of} 790% after 20 years. ^{what became} ~~Vaccination policy~~ ^{clearly} ~~shifted~~

Partially protected individuals, when exposed to smallpox, got a subclinical infection with

major increase in antibody, ~~with the usual side effects~~ as much as happens with measles

^{in future} Today. However good our vaccination program was, we were obviously making a lot of response

and vaccine in non-vaccinating populations. We were doing things right but not the right things. We should direct it to focus on younger people and to get a ~~100%~~ vaccine as soon as we can.

A more egregious example of the observation that there is more to management than ~~getting~~ doing

things right comes from a supposed management critic's review of Schubert's Unfinished Symphony.

Attribution: Chairman of The London Observer. Anecdote about a management critic's review of Schubert's Unfinished Symphony

It appears that for a considerable period of time the four oboe players had nothing to do. The number should be reduced, and their work spread over the whole orchestra, thus eliminating peaks of activity.

All 12 violins were playing identical notes. This seems unnecessary duplication and the staff of the section should be drastically cut. If a large volume of sound is really required, this could be obtained through an electric amplifier.

No useful purpose is served by repeating with horns the passage that has already been handled by the strings. If all such redundant passages were eliminated, the concert could be reduced from two hours to 20 minutes. If Schubert had attended these matters, he would probably have finished his symphony.

Reads like a ~~GA~~ ^{GA} report. So much for management critics!

A third precept which has served me ^{especially} well over the years derives from ~~my~~ ^{my} just past
 It's an answer to what do you do when you don't know what to do. ^{by my experience}
 medical training at the U. of Rochester. ^{a problem} The point was made again and again that however
 puzzling ~~the~~ ^{a problem} case, however problematical the diagnosis, ~~the patient~~ ^{the patient} ~~and his family~~ ^{the history} provided
 by the patient and his family usually told you precisely what the problem was, ^{and} indeed, more often than not,
~~they would tell you~~ ^{they would tell you} the diagnosis itself. The secret was ^{careful, thorough} questioning and the
 key word was ^{to} LISTEN. How did this translate for me?

In some 10 years, I directed the E-I-S, all were on call 24 hours a day with the
 expectation that, if epidemic help was needed, you would get them (wherever there is) that day or early the
 next. Not surprisingly, it was the Chief EIS officer in the early days who was expected to deal with
 the really tough problems. I recall only too vividly ^{on too many} ^{to recount} occasions [flying into a city with
 some sort of mysterious outbreak, possibly food or water borne, only to be besieged ^{immediately} by public health
^{staff} the press, civic authorities and who knows ~~what~~ ^{who} all seeking ^{immediate answers} to ~~the~~ ^{the} ~~problem~~ ^{problem}.
 I often ^{found} ~~found~~ that I really didn't ~~know~~ ^{know} my self ~~to~~ ^{to} have a clue as to ^{thus} ~~what~~ ^{what} we might be dealing with, I ^{thus} ~~then~~ turned to the tried and
 adopting what I hoped was a confident - appearing and reflective demeanor ^{and}
 true method of asking question after question and LISTENING. ^{Most of} ~~the~~ ^{the} ~~time~~ ^{time}

would find a number of people who had a pretty clear idea not only of what the problem was but how it could be solved. It was simply that no one in authority ~~was~~ ^{was listening - and unfortunately deaf} ~~was listening~~ ^{was listening} - and unfortunately deaf authorities ~~are~~ ^{seem to be} in all too abundant supply in all too many organizations today, ^{at least}.

Thus, for our smallpox program, it was a rule that all staff spend $\frac{1}{2}$ of their time in the field with vaccinators and ^{lower level} supervisors - observing, questioning, listening. And so arose a surprising number of good ideas when one asked - how could this job be done better, or faster or more efficiently.

What ~~was~~ ^{could} we at state or national or international level provide which would ^{help} ~~assist~~ you do a better job.

One of the most surprising discoveries came from Indonesia. There, they had surveillance officers who went out each day by bus or bicycle to seek reports of smallpox ^{from clinics and village leaders.} One of the ^{staff} ~~officers~~ characterized as efficient but ^{possibly} basically lazy, returned ^{by noon} each day to HQ ^{but} with the most incredibly long list ^{of infected} villages - most of which were ^{but} comprised. ~~How he accomplished this, he offered no explanation.~~ ^{When we questioned him, he offered no explanation.} ^{a single list}

He had a pictorial training manual which we had prepared and carried it to ~~the~~ ^{our} elementary school ^{and}, class by class, showed the pictures of smallpox and asked if anyone had seen a patient such as that. It didn't take long to discover that 8 to 12 year old children generally know just about everything that went on in their villages and were more than enthusiastic to

For all. Thus on the WHO recognition card which came to be used in countries throughout the world.

Finally, ~~it would like to say that the~~ ^{it seems to me that the future} of public health and preventive medicine ^{heavily} rests with

research and that any public health program which does not embrace an active research program does

an enormous disservice to the program and, indeed, to our profession. ^{Now almost} I can hear ^{the} muttering

out there ~~that's~~ ^{Sure - sure -} but how many programs have a budget line marked "research"

^{a source} with all the demands of ~~the~~ program, who has time to do research. The bottom line is that of

^{our} ~~the~~ only concern is doing things right and ^{we} ~~are~~ ^{constantly} asking are we doing the right things ~~the~~ -

^{becomes} the program ~~is~~ locked with a rigid ~~official, the most efficient~~ ^{and} ~~rigidity~~ which ~~will fall far~~ ^{of a potential} can procedures not be more efficient, better, cheaper faster - the program becomes locked in a ^{less than optimal}

rigid framework, the staff becomes bored and major opportunities are lost. But ^{you say} ~~surely~~ ^{today}

some element of research ^{must be} ~~is~~ ^{at least a major} ~~integral~~ ^{part} of every program. Not so ~~easy~~ ^{to} ~~do~~ ^{as} ~~it~~ ^{seems} ~~to~~ ^{to} ~~be~~ ⁱⁿ ~~the~~ ^{public health} ~~field~~ ^{in general}. ~~More than this I~~ ^{apprehend} ~~that~~ ^{is} ~~the~~ ^{most} ~~fruitful~~ ^{source} ~~of~~ ^{of} ~~research~~ ^{programs}.

Let me illustrate. You may recall that in 1955 the WHO with substantial U.S. help launched

the world's largest eradication program - against malaria. More than \$2 billion was

ended in little more than 10 years. ~~As the program progressed,~~ ^{As the program progressed,} the mosquitoes grew increasingly resistant to insecticides

and the parasite became even more drug resistant but there were few alternatives to which to turn.

As the ^{lead} program began, the decision ^{had been} made that "we ~~know~~ have the tools to do the job, we know what to do; it's simply a matter of management and administration." Virtually all research effort was terminated.

A tightly managed, rigid ~~program~~ ^{program} went down the drain and left almost nothing for the expansion of PA bill in international health authorities to learn from?

Did they learn? ^{As smallpox eradication began in 1967,} I was told "we have the tools, we

know what to do; it's simply a matter of management and administration" and I was told that ^{properly used} research budget of \$40000 was ^{not} necessary. ^{With or without special research funds we} ~~then~~ ^{then} pursued an active research program with the result that

Virtually every component of the program changed - developed a new vaccination instrument, changed vaccine ^{our understanding of the epidemiology of smallpox had changed radically and this led to our} production standards, ^{repeatedly already and others} changed the strategy of the program, and were well on our way to completing work on a new vaccine.

Had we pursued our original plan and course of action, we would never have succeeded. Have we learned from this?

Not really. A polio eradication strategy evolved first in the Americas and with considerable research ^{or badly needed} intent. Then it moved to the global ^{scene} ~~scene~~. Research stopped; early efforts to develop a ~~vaccine~~ ^{vaccine}

heat-stable, more potent ^{polio} vaccine were terminated on the grounds that ~~the~~ ^{had been} polio ~~was~~ ^{was} successfully

(Global goals evaluation is ^{now} plodding toward a year 2000 goal ~~which~~, with no hope of reaching there before 2005.

announced in the Americas ~~with~~ despite use of a few from optimal preparation. Therefore it could be

done every where. ^{the development of} More recent proposals for exploring a measles vaccine which might be able to and to open the door to ^{the} possible vaccination effort

has given at a near ^{total} but they have been disparaged as being unnecessary as followed by the mantra "we have the tools, we know what to do, it's simply a matter of management and administration programs dealing with"

I could repeat the same story for functional deficiency disorders, contraceptive,

^{many} pharmaceutical products and the list goes on. Some how the bridge between bench and bench

must be ^{better} built. ^{will} If built, and given the incredible advances of biotechnology, there is

world of promise awaiting, a world of adventure, a world of achievement.

^{hopefully bridge-builders all}

I welcome you to the profession. Have fun - question and listen, do the

right things and never forget that it is ^{the} research ~~effort~~ which ~~can~~ can transform

~~stagnant~~ ~~stuff~~ ~~and~~ plodding programs into brilliant breakthroughs! ^{And do} ~~But~~ choose your

careers especially with care.