Questions

Reminiscence of the obvious: as concerns the problem of the real world —

To the extent that advanced countries already perceive needs for health cooperation, they will have advanced their own initiatives. I believe that perception is unrealistically shallow (i.e. threats of yet-age dissemination of serious human disease are surely discounted, even in the face of disasters like corn blight in U.S. or hoof & mouth disease in British cattle. I

For them, and even more for the poor countries we must still deal with these problems in the light of their perceptions, as much as of "objective facts." Who they are is also an issue — diplomat? center government? ministry of health? press? physicians? elements influencing communication among those prejudices may be the most important (and challenging) task.

It may be futile, even disastrous to attempt to deal with the "health issue" out of harmony with other agents of national development — economic growth, social policy, education, etc. (Many of these may be beyond the usual reach of outside forces). What use to fruitless child survival without adult check on population growth?

* Further, some of the programs hereafter may have political ramifications that outweigh other values; they may still have some precedent values. (E.g. - "later - rights in tradition of plants")
However, in many areas (including the U.S!.) the cycle of poverty - disease - education/fertility may be the central misjudgment to economic advance. Thus schistosomiasis disease is a drag on productivity in Egypt as hookworm once was in U.S. and Wales elsewhere. The disease component may be a crucial target for breaking the vicious cycle.

There are 3 main elements:

1. Nutrition
2. Environmental sanitation (controlling vectors, transit and routes of contagion through water and food contamination)
3. Specific therapy and prophylaxis - vaccines, drugs, etc.

This is now mostly a question of public administration & finance. It is hard to see how much sophistication can be added within realistic costs. However, it has an important international element - rejecting and quarantine procedures. The problem is not the lack of US cooperation. Still we might add something here through some research on very early disease recognition and identification to spot diseases before they have penetrated too far beyond a national boundary. (Imagine an automated breath or saliva test on
debarking passengers as an extrapolation of some proposed gadgets for bed monitoring. A useful fever-sitter at an acceptable cost, especially within the state-of-the-art!

But our travel has become so fast that many infections will still be surmised between takeoff and landing.

In areas (like much of India) with very high water tables—rice paddies country—we may have to investigate and devise new different approaches to sanitary degerm. How we are accustomed to cheap pellicle disinfectants for water sources are still a research challenge, but few traditions sanitarians will admit this. How much chlorine do you want in your water!

We have to be very careful about partial solutions. Nothing would be worse than a water supply that was clean 365 days, heavily polluted only once per year! For the population would then be deprived of the “natural” chemical insults that lead to low-grade disease and immunity to many infections.

The WHO does put clean water supplies very high on its list of (unfilled) priorities.
2. Nutrition may be the most favorable arena for scientific cooperation — as the hill Rice Research Institute of El Salvador’s works in Mexico well illustrate.

Malnutrition may irreversibly impair the quality of a child’s brain. It also weakens individual resistance to every other disease, and saps productivity.

Research on the improving the quality, as well as yield, of indigenous crops would undoubtedly be the most fruitful investment. There is no reason in principle why plant crosses should not be developed that are as nutritious as meat. The techniques of genetic engineering used so far in plant breeding are relatively crude and there has still been a minimus of effective communication between plant breeders and molecular biology researchers within the U.S. How much more distant they are when the field work must be done abroad! Unless potatoes and rice crops are programmed.

The success of dwarf rice and wheat shows how exportable this kind of advance can be.

As an interim, potato crops can also be upgraded.
by synthetic supplements, e.g. lysine. Obviously, the chemical industry involved should be peripheralized as far as possible. Microbial (such as) protein grown on oil and vacuum wastes also plays a role here. I do not believe they will have a long-term future in competition with an intensified agriculture.

Line-bred cresses, as we learned with grief from the outbreak of corn blight, are at risk of being conquered by a specific plant pest; work on anticipating and controlling these must be part of any new efforts.

New approaches to plant-breeding may also enlarge the utilization of semi-wild or latent or other under-utilized land areas.
2. SUMMARY

A. Methods for identifying specific deficiencies in different populations.
   (You would not believe how badly we understand this in the US!)
   (Obviously you can't treat lysine deficiency with vitamin B1. But different continents must have different care problems.)
   Individual variation in nutrient needs — age, occupation, health, pregnancy, etc. (FAO standards are crude approximations.)
   Role of trace metals (remaining frontier of science. Need knowledge at qualitative level.)
   Is chromium a dietary essential?

Secondary problems: Health implications of imbalance in sugar, fat, etc.
B. Modernize plant breeding by crossbreeding with cell and molecular biology.

MUTATION studies: Engineering seed proteins to upgrade food quality.

Laboratory studies on hybrid cell cultures (and readily manipulated) prior to field tests on entire crops. Systematic development of more sophisticated evaluation of new strains.

Wide crosses

Cell fusion (to allow otherwise impossible hybrids).

Engineering "friendly" viruses to modify plant properties.

Specific mixed crop associations e.g. different legumes with each other or with other crops (immediately overlooked as too labor-intensive in advanced countries).

Scientific breakthrough are imminent. Some area as I fear for application to seed engineering.
INFECTIONOUS DISEASE

Generally speaking, the main infectious disease problems of the advanced world are acute epidemics — influenza, hepatitis, encephalitis — while mortality is the hazard. High technology still has many tests left.

The poor countries are not immune to these, but they face still more severe problems of chronic disease where the consequence is debilitation (and the poverty cycle), blindness, mental. These are the problems structurally reinforced by social traditions and nutritional and educational failure.
(3) Medical treatment and prophylaxis of infectious disease.

The existing major waste is to:

- malaria
- smallpox
- schistosomiasis disease
- trachoma
- leprosy
- tuberculosis
- and to a lesser extent
- cholera and typhoid
- amebic dysentery
- bacillary dysentery (ubiquitous but less lethal)
- and a host of syphiliotic diseases that flare up periodically
- plague, typhus fever,
- several diseases
- and innumerable worms.

Except for VD.

None of these is now a major problem in advanced countries; but there is a perpetual threat of emergence of virulent strains or other breakthroughs. There are also many "exotic diseases", poorly known, like dengue fever or Marburg virus that might become catastrophic threats to the US population (like 10% mortality) at any time. It would be in our interest to develop well-equipped
field (or mobile) laboratories that could be deployed at infectious agents (1) to maximize benefits to local populations and (2) minimize the risk of importing a new disease into the U.S. before we understood it. A CSA with built-in disinfecting gear, or deployed from a properly equipped base would, of course handle the latest requirements and offer some variety of tactical training experience to its pilots.

The real job that needs to be done is the painstaking study of all viruses as potential disease agents. Major classes of viruses probably still remain to be uncovered. A great deal of work is, of course, ongoing and it would be difficult to improve much until structure on basic research. However, the WHO certainly could help to stimulate such viral activity in many countries and help communicate within US and European experts who can help chart the most promising unexplored territories. This is one area where a formal international conference about every 3 years would be most useful.

Such a conference would obviate our own agenda for areas of research emphasis. However, some highlights would surely include:
Patterns for answers
(technical aspects of questions are not political favoured)

Forms of cooperation and US participation therein.

A) More money for WHO.

Federal Taxes – gifts.

Obvious drawbacks.

Legy on intercontinental air travel (tuery fox)

a) to fund coordinating role of WHO.

b) to acknowledge benefit to the families of health
improvement at his destination.

Royalties on certain kinds of drugs.

a) those based on folk-medicine. A kind of cognition
for the exploitation of the fruits of another culture.

Kynamite; digitalis (English); Pancreon (Indian)
are spectacular examples. There may be many
more in the offing.

WHO could accelerate their orderly exploitation.

1) Perhaps a convention against “stealing”
valuable medicinal plants or animals.

Cf. Marca Polo and the wildebeest eggs.

2) or other medicinal sources. The “buy” that makes
chloramphenicol was taken from Venezuelan soil.

2) Special case. Modern jungle yam as
source of steroids is not a medicinal plant
if still should be protected by convention from
being taken out of Illinois for progestins elsewhere without a license.

c) "drugs from the sea": Extension of seabed concept.

d) Drugs tested on other country populations - this also could be facilitated by WHO. This would be politically delicate but the same country (say pregnancy) was prevalent enough in a rich country to allow its screening testing there.

Contributions pressure on behalf of medically trained migrants

A brain drain tax. US sends up an enormous number of foreign MB's. Direct part of their income tax, or gift payments to WHO, etc.

All of these items could be reduced to paper calculations and assessed as being from contributions from various countries.
High technology and its transfer

1. World scientific conferences (PROG, GENES, CELLS, LIFE FOR PEACE) in
   model of Atmosphere Peace.
   WHO Assemblies are political.
   Specialist conferences too narrow.
   
   Biologists &
   Biochemists have never been brought together
   with practical medical & agricultural
   work in the context of a world mission

(Cf. my proposal to the Nobel Foundation, which has not been adopted, perhaps owing to the generally cool reaction to the Sept. 1969 conference. It was badly out of focus.)
2. World Health Institute. (Back to money)

Grants programs administered by UND organizations, analogous to NIH.

Even if geographic factors must dominate country allocations, a central agency can provide the staff competence (like NIH) for efficient and minimally politicized choices of meritorious projects.

3. U.S. National Institute of Health. (Back to money)

Had de facto standing a few years ago, was killed by the gold drain problem. We could still:

a) put higher priority on NIH-oriented research in NIH.

b) make further use of counterpart funds.

4a. Revive the Fulbright exchange program in health

b. Better variant: designate specific pairs of institutions to manage exchanges, giving them some latitude for free validating exchanges. (E.G. Stanford could accept a sister's fellow to Berkeley.)

We have a very successful program with Paris under
a US-Italian treaty for science cooperation
managed by NSF. Our fellows are well screened
and we have fewer brain drain problems
when the fellows know they can come back
to the US periodically.

5. Everything costs money. But some of it can be
in better accordance.

Health might be given a preferred standing for
"gifts of unusual capacity in transport and
communications on a standby basis. What
this "costs" is a matter of accounting philosophy.

The free tickets on national airlines for students
or patients should be counted as matching funds.
Even give the coupons to WHO for distribution and
negotiate the subsidy rates demonstrably. (The
airlines have to be subsidized and taxed many dif-
ferent ways anyhow; they surely get a large subsidy
in the net outcome).

Apply to all health-connected transfers: fellows,
doctors, consultants, patients for specialized care,
students, publications, equipment....

to communications - e.g. in government +
intergovernment subsidized satellites, get back
part of the investment this way.
Classification - identification - taxonomy of viruses. Their evolutionary relationships to microorganisms and to normal cell constituents.

Sensitive detection (monitoring) methods

Approaches to chemotherapy. Certain bacteria, viruses are still generally beyond the reach of antibiotics. But some drugs are emerging. Interferon.

Basic studies on the life cycle of viruses in cells. Next to, and overlapping, "genes", at the center of molecular biology.

Virus genetics - for understanding bases of virulence of certain strains, and for rational production of vaccines. (Sabin's approach on polio was as empirical as Pasteur's had been on rabies).

Validation of a library of cell types on which live viruses can be rapidly grown. A critical delay in response to Hong Kong flu was a consequence of its poor growth in the traditional chick embryo. Our health authorities have been confused for a decade on the utilization of peritoneal culture.
- but we still produce polo virus in monkey tissue known to be risky for contamination by other viruses.

Closely related - the management of wildlife and animal resources for virus research and production. We are slaughtering monkeys, where we all know some domestic fowl animals for pest might do as well. The real cost of importing monkeys, as with many other costly renewable resources, is probably underestimated.

Since vaccination is the keystone of preventive for direct-catastrophic diseases, the process of immunity to viruses must be understood. We still have only a superficial idea of what happens in vaccination, where the vaccinee is which elements of the virus particle are crucial for eliciting immunity and why. How to purify viruses for safety, stability & efficacy. (Most commercial vaccines are grossly inexact.)

Producing antibodies synthetically or in cell culture for passive immunization, which can be applied for immediate therapy as well as short-term (3-6 month) prophylaxis.
New approaches to vector (insect, flea, mite, tick, snail) control.

New & safer pesticides as adopted, e.g. to topical conditions.

Biological control.

Fleas

Biological tricks on the pests.

Merges with problem of plant pests.

All of above have vital application to veterinary as well as human health!

FOCUSED attack on major specific disease (Bearing in mind what we already know perhaps more emphasis in higher sophistication of approach.)

Priorities:

WORMS

TRACHOMA

Other viruses

Bacterial infections
Offer Ft. Detrick (at least as a physical facility) to WHO for world health/ infectious disease research on premise that further arrangements will be worked out for cooperative funding of operating costs. Go as far as deeding title to UK.

[Signature]

Can be nucleus of campus of a World Health University.