



The ~~committee~~ very generous and considerable amount of vaccine by the USSR has, I might note, been the <sup>major</sup> ~~only~~ <sup>source</sup> ~~salvator~~ for the ~~problem~~ of vaccine shortages.

There are ~~some~~ <sup>the principle</sup> admin-ops. problems if you will

There are other problems of a technical sort - specifically ~~relating to~~ <sup>production</sup> process of adequate supplies of freeze-dried vaccine, <sup>problem on a practical + logistical side</sup> - <sup>many</sup> these are difficult but I believe we are in process of solving <sup>at least seeing the manner by which they might be solved</sup>

But our fundamental problems are administrative <sup>not so much technical as</sup> - both at a national and an international level. The most <sup>penetrating</sup> ~~concise~~ <sup>summary</sup> of the situation was provided by ~~Dr. Fred Cooper~~ <sup>a distinguished former Regional Director of WHO</sup> who was, as you know, <sup>formerly</sup> Director of the Regional Office for the Americas. In a ~~speech~~ <sup>paper</sup> at SE seminar in late 1965, he said as

"Our generation has no excuse to offer future generations if we continue to permit half of the human race to suffer from smallpox while we attempt to defend ourselves with costly and inefficient quarantine and vaccination certificates."

"The selling has been done; the tools are available; support has been assured; the programme is already well-advanced. The only question is whether our national and international administrative agencies can measure up to the challenge."

really good freeze-dried vaccine <sup>to</sup> ~~at~~ -37° (Cockburn)

unstable - room temp. - may be intact 1-3 days <sup>easy to produce + many labs. if you should be checking it out.</sup>

EXPAND - many countries, <sup>glycerinated</sup> ~~lyophilized~~ vaccine <sup>still</sup> used - one country - Arg. stability is nil.

other countries - freeze-dried vaccine  $\bar{c}$  incredibly low potencies but fewer labs. able to <sup>produce - on form of assistance + more countries producing</sup>

Many countries - doing enough vac. now -  $\bar{c}$  adeg. vaccine would eliminate the dis.

devotes a morning's conference to  
To discuss smallpox, let alone smallpox eradication, in a group so worldly  
health wise as this would seem a bit presumptuous for I venture to say there are  
few <sup>here</sup> who would not qualify themselves in the category as being at least intelligently  
knowledgable of the subject, <sup>and</sup> if not amateur experts, at least expert amateurs.  
For after all, everyone <sup>here</sup> has been vaccinated one or more times (at least I'll  
prosume so altho I'll not pursue the point further) <sup>and thus is not unacquainted with the procedures</sup>  
after all but simply vaccinating a population until the disease disappears. In fact,  
this <sup>approach</sup> ~~understanding~~, which I'm sure is ~~at~~ a minimum common denominator of our  
understanding, is reasonably correct.

No need to grapple with mosquitoes with latin names  
Problems <sup>type-specific strains of virus</sup> of vaccines, which may or may not be effective.  
Mysterious <sup>single</sup> reservoirs ~~of~~ disease.

I should like, therefore, to stand away from the problem just a bit to <sup>briefly try to</sup> explore the  
<sup>view with you</sup> ~~the~~ problem of smallpox in perspective and to say "why smallpox eradication";  
to explore certain <sup>then</sup> of the ~~theoretical~~ <sup>technical</sup> ~~practical~~ <sup>concurrent</sup> ~~problems~~ <sup>issues</sup> ~~the~~ <sup>practical</sup> ~~logistical~~ <sup>considerations</sup>;  
to touch briefly on <sup>principles</sup> ~~certain~~ <sup>principles</sup> ~~of the~~ <sup>in regard to</sup> ~~logistics~~ <sup>implementation</sup> and <sup>finally</sup> to conclude with ~~the~~ a  
summary of the <sup>problems</sup> ~~problems~~ <sup>confronting</sup> ~~us~~ <sup>in</sup> ~~this~~ <sup>the 14<sup>th</sup> month of the program</sup> ~~program~~ <sup>and some prospects</sup>  
~~of~~ ~~the~~ ~~future~~ ~~with~~ ~~regard~~ ~~for~~ ~~the~~ ~~fact~~ ~~that~~ ~~this~~ ~~is~~ ~~a~~ ~~closed~~ ~~meeting~~ ~~and~~ ~~a~~ ~~full~~ ~~expression~~  
~~of~~ ~~views~~ ~~has~~ ~~been~~ ~~made~~ ~~specifically~~ ~~that~~ ~~this~~ ~~is~~ ~~a~~ ~~closed~~ ~~meeting~~ ~~and~~ ~~a~~ ~~full~~ ~~expression~~  
~~of~~ ~~views~~ ~~has~~ ~~been~~ ~~made~~ ~~specifically~~ ~~that~~ ~~this~~ ~~is~~ ~~a~~ ~~closed~~ ~~meeting~~ ~~and~~ ~~a~~ ~~full~~ ~~expression~~  
I think a summary of the situation as possible ~~and~~ <sup>as we now see it.</sup>

last year - from entire world, ~~two~~ <sup>two</sup> cases of smallpox reported. Admittedly  
underreported but assuming this to be a half a quarter or a tenth of all cases, the  
number is not large. Reason ~~is~~ <sup>is</sup> for this is not particularly obscure,

There is in <sup>fact</sup> <sup>practically</sup> <sup>today</sup> in every country ~~of~~ <sup>of</sup> the world some form of smallpox control  
No other vaccine and, in fact, <sup>I venture to say</sup> no other preventive health measure is so widely or  
systematically employed.

~~With~~ <sup>now</sup> smallpox <sup>as remote</sup> as it is, tendency to forget the implications which the disease carries.

Disease dependent only on person to person spread - <sup>it's</sup> historically and potentially  
every population is <sup>a potential</sup> ~~potentially~~ <sup>victim</sup>.

Unvac. - variola major - mortality 40%. Assumed this India - <sup>in Pakistan</sup> <sup>very</sup> <sup>facilities</sup>  
and care not adequate to treat all. 1962 - U.K. 1963 - Sweden.

Potential of the disease is not forgotten -

Recent intro. Legation - for 1 case - 50,000 vaccinated over 100  
isolated. Admittedly a bit rigorous

Could not help reflect in USA, the irony of vaccinating  $\approx 16 \times 10^6$  / yr. for a disease in which last case dx 17 yrs. ago.

Reason - 120,000 cases only reported - based on a fear of <sup>the disease</sup> - none today which any where men approached it in potential for spread + mortality.

Endemic smallpox today - comparatively limited geographically

Brazil + some in bordering areas

Africa below the Sahara

~~SE~~ Asia - India, Pakistan, Nepal, Afghanistan, Indonesia  
perhaps a touch in Burma.

Other side of coin - N. + C America, Europe, North Africa, Middle Eastern countries, and ~~actually~~ <sup>12 yrs. since any spox in CA.</sup> many areas in ~~SE~~ Asia (Korea, Japan, China, P.I., Vietnam, Laos, Cambodia, Thailand, etc.)

Our program begins

Our problem simply - to keep the disease from re-infecting these areas while ~~the~~ vaccination activities are augmented in the endemic areas.

Smallpox is gone

The Organization is committed to two eradication programs - malaria and smallpox.

While on the surface, it ~~would~~ <sup>has</sup> appeared <sup>to many</sup> that a disease is a disease and eradication is eradication, the ~~ecology of malaria and the problems of~~ <sup>ecology of smallpox and the problems of</sup> the ~~two programs~~ of malaria eradication and smallpox eradication are totally dissimilar.

The tactics necessary for eradication are different and <sup>(spatially)</sup> the prospects for success.

1. Smallpox - transmitted only man-to-man - must keep the transmission cycle going if it is to persist.
2. Individual infected - capable of transmitting infection for 2-3 weeks at the most. At the end of this time, immune <sup>in fact</sup> ~~is not~~ more immune than if vaccinated for repeat cases are exceedingly rare. Thus, to the smallpox program - the

Problems:

1. ~~More cities remote, isolated, difficult of access villages are of <sup>little</sup> comparative little concern.~~
2. ~~India~~ Smallpox can not long persist in such location.
3. ~~Coordination~~ Illustrated, in fact, in areas such as Somalia, where disease introduced, burns briefly and dies.
4. ~~Expenses.~~

Key points

5. ~~1.~~ A good vaccine which confers a substantial ~~immunity~~ <sup>immunity</sup> for a long period. How substantial and how long. Need for re-vaccination annually? Perhaps - for virtually 100% protection. Exam. of data - even most pessimistic grant it 80% level at 10 years.

- 3. Do case rarely occurs in subclinical form - ~~but~~ <sup>the, reasonably readily</sup> detected. <sup>Months made of the typical time.</sup> When it does occur in modified form & - difficult diagnosis - does not appear to be transmitted easily or for a long period.
- 4. Spread is slow - 2 wk. incubation period - normally ~ 3-5 persons infected from a given case. Opportunity for containment.

Basic facts - Not go into all of the principles involved in development of the program

Increase immunes to the point where transmission ceases to occur.

1. Sutton's law - "mobile team"
2. Systematic vaccination with emphasis on areas where spread is most likely - densely crowded areas - major cities + maintain immunity. One distinguished consultant - 10 major cities in India for 3 years.
3. Development of a surveillance system for early detection and containment.

~~Underlying all of this is the need of course to~~  
I shall not dwell on the need for <sup>appropriate</sup> integration of these activities with the general health services and the importance of health education to the program; they are implicit to the basic skeleton I have given. Fundamental to any health program.

Where is the program today -

Get injectors (500 per 1000 / hr) capability under trial in these areas as well as Brazil

1. South America - moving aggressively with programs anticipated in every country by the end of 1967. Five year target. I'm counting on our last cases occurring in 1969.
2. Africa - US bilateral assistance in 19 West and Central African countries. Programs begun now in 15 - remainder by the close of 1967. Provided some reasonable political stability persists, I'm counting on our last cases there in 1970. In E. Africa, ~~plans of operations developed in Congo Kinshasa~~ <sup>plans of operations developed in Congo Kinshasa and Sudan</sup> and Tanzania with programs also likely this year in Kenya and Zambia extending to other countries in 1968. East Africa <sup>is</sup> more difficult to predict - Ethiopia will be a problem - large population, difficult transport. <sup>Portuguese areas may or may not keep pace;</sup> Congo Kinshasa is ~~not~~ a difficult problem. We have no communication in S. Africa. <sup>Coordination of the program on the part of the Regional Office will be requisite - whether this will be the difficult and taxing task at best demanding the maximum in skill and capability.</sup>

3. Asia - dealing with 5 countries India, Pakistan, Nepal, Afghanistan, Indonesia. The last two I am optimistic about. Afghanistan has had a <sup>developing</sup> program over the past 3 years and <sup>has made</sup> ~~is making~~ good progress. The population is comparatively scattered - only contact is ~~to~~ Pakistan and ~~the~~ movement across the border channelled. An imaginative program to terminate transmission in 2 or at most 3 years. Indonesia, assuming some element of <sup>political</sup> stability for a few years could readily do the job and has <sup>already</sup> shown it can do so. In 1960, as a matter of fact, its disease incidence had reached '0'. A pilot program of 500,000 persons was brilliantly carried out in West Java only last year.

India, Pakistan and, to a much lesser extent Nepal represent real headaches.

India completing a 3 year phase - 500,000,000 vaccinated in Pakistan <sup>rationally</sup> vaccinating 1/3 of the population annually altho <sup>more success</sup> ~~at least initially~~ can be said - never in the course of the history of smallpox eradication or control have so many been <sup>rationally</sup> vaccinated in such a short space of time with as little success. e.g. Delhi 140% vaccinated ~~to~~ epidemics - evaluation showed <sup>successfully vaccinated</sup> ~~290%~~ <sup>290%</sup> most cases occurring in even more poorly vaccinated fringe populations.

Programs in India <sup>comprehensively</sup> ~~well~~ assessed over 3 years ago (Dr. Gelfand helped establish) and repeatedly since. Program then as now criticized for

- 1) Incredibly complex and unworkable family registers system. <sup>No provision for</sup> ~~floating~~ population
- 2) Supervision which was <sup>virtually</sup> ~~in~~ formally nil. (Palaeolithic records ~~was~~ <sup>one entry in registry</sup> ~~uncommon~~ - ~~was~~ <sup>man</sup> ~~one~~ <sup>one</sup> ~~one~~ <sup>one</sup> - died 3 yrs. before).
- 3) Use of the rotary drill - wicked instrument. Condemned by the Expert Committee on smallpox + by Indian Advisory Groups.

No ~~being~~ <sup>being</sup> ~~in~~ <sup>in</sup> the program ~~virtually~~

Similar criticisms extend to Pakistan and Nepal. At present, <sup>disappointing that</sup> the federal structure for the program <sup>is</sup> about to be dissolved totally and the program handed to the states. This has been done, in major part already in several states. The result is a sharp increase in smallpox <sup>in India</sup> ~~this~~ <sup>year</sup>. In some states, <sup>this</sup> ~~perhaps~~ maybe the worst year in a decade.

I'm afraid not so difficult but similar problems prevail in ~~India~~ <sup>Pakistan and</sup> Nepal.