

## OPEN DISCUSSION

Moderator: Dr. Gratz

**Dr. Gratz:** I was particularly interested, Dr. Gaon, in your remark that the lousiness rate in some parts of Yugoslavia continues between 3 and 5 per cent year after year. This may be quite significant in the long run. Do you know why this persistence occurs?

**Dr. Gaon:** I suppose it is simply that lice are persistent. There is no country that does not have them; in mine they seem to occur in very remote mountain villages, though the rising standard of living in those villages has aided our louse control program and infestation is steadily declining. I was very pessimistic about the situation until about 10 years ago because in hundreds of villages lousiness afflicted 20 per cent of the population.

**Dr. Busvine:** Dr. Gratz asked why a small amount of lousiness persists in Yugoslavia. Why are 5 or 10 per cent of the children in Britain lousy? This is a very unsatisfactory situation. With all the insecticides and other control possibilities we have, we surely ought to get rid of lice. But what is more important than continuing minor lousiness is the possibility that if we continue our insecticide campaigns, we will end up with a residue not of 2 per cent lousiness but of 2 per cent resistant lousiness. Then we will lose the insecticidal weapon with which we could attack epidemics or the spread of lice in the future.

**Dr. Gratz:** Is the 5 to 10 per cent figure you mentioned of head or body lice?

**Dr. Busvine:** Head lice, but the general implications are the same.

**Dr. Wegner:** In connection with Dr. Busvine's remarks, I would like to mention that in Poland we use herbal extracts from widely growing plants for the individual control of head lice. These extracts are Delacet, which is produced from *Delphinium consolida*, and Artemisol, from *Tanacetum vulgare*. Both extracts are nontoxic for

humans and their effect on head lice is similar to that of sabadilla; after being exposed to Delacet or Artemisol for two to three hours, both lice and eggs are destroyed.

**Dr. Gaon:** In Yugoslavia we examine school children for lousiness because this gives us an indication whether lousiness is occurring in the general population, and then we go into households to see first how many people are lousy and then what the louse density is. We have always found more head lice than body lice.

**Dr. Fox:** The previous comments bring to mind the question, When should we really try to control lice? My own limited and relatively old experience has been in the Peruvian *altiplano*, but perhaps I can generalize from that to the louse situation in many underdeveloped areas. I would argue that it might be a mistake to try to eradicate lice by chemical and other specific means in underdeveloped areas unless or until there is some real prospect of getting rid of them once and for all. Otherwise the residual louse populations will become resistant to whatever insecticides are employed, and then there will be little that can be done about the resistance. Other health problems that peoples in underdeveloped areas face are usually more significant than the generally endemic diseases spread by lice.

**Dr. Gratz:** Dr. Gear, you noted the steady, apparently constant increase in the number of typhus cases in southern Africa since 1963. Is there any obvious reason for this? Is the reporting just better or do you think the increase in your country is real?

**Dr. Gear:** Before DDT became available the incidence of louse-borne typhus was high in South Africa, but since its introduction the reported number of cases has fallen from a thousand or more a year to one or two hundred. It remained at that level until two

or three years ago, and there has been an apparent increase since then. One reason for the apparent increase has been the small outbreaks that I mentioned in my paper. One of the two sharp typhus outbreaks this year in southern Africa was in northern Lesotho, an independent territory within the borders of the Republic of South Africa, and the other was in the Queenstown district near the border of the Transkei. The Lesotho outbreak caused hundreds of cases and many deaths. DDT brought both outbreaks quickly under control, though it is interesting to recall that one of the first reported instances of louse resistance to DDT was reported from Queenstown in the early 1950's. Our national health department has begun testing louse susceptibility to insecticides to see if resistance might play a role in such outbreaks.

**Dr. Smith:** Has carbaryl been used in the louse eradication program in South Africa?

**Dr. Gear:** Our main louse control insecticides have been DDT and BHC. Carbaryl is presumably available, but no special studies have been made of its use to control louse-borne typhus.

**Dr. Gerberg:** You mentioned that head lice were transmitters of epidemic louse-borne typhus. Has this been documented in the literature?

**Dr. Gear:** Yes, during World War II, when we investigated a typhus epidemic in the Transkei and showed that both head and body lice were harboring the infection, though I would not say we proved that both transmitted it. Pubic lice did not harbor it.

**Dr. Gaon:** We have easily infected head lice with *Rickettsia prowazeki* in the laboratory, but we have found it impossible to prove that they transmit the pathogen. In Yugoslavia, for instance, both head and body lice have been found in large numbers in many epidemics, but there has never been a case when only head lice were observed, even though 5 or 10 per cent of the people might

have had head louse infestations. Still, because head lice may transmit typhus, we must attach great importance to them as body lice disappear.

**Dr. Fabrikant:** Dr. Makara, you mentioned that lousiness persists in Hungary despite the use of both DDT and malathion. Are louse sensitivity data about each insecticide available, and for what purposes other than public health protection has malathion been used in your country?

**Dr. Makara:** We changed to malathion when DDT resistance was proved and now we use DDT much less, though malathion is used only in powder form. We feel malathion's best use is for impregnating clothing against body lice, and we do not use it against head lice at all. It is very little used outside public health work, and not at all in agriculture. Yes, tests in our central laboratories have shown that lice are sensitive to it.

I should note that the use of an insecticide against lice is compulsory in Hungary, and since it is free for that purpose it is readily available. It is required to use an insecticide on each lousy person once a month for three months, but I disagree with this policy because the procedure does not kill nits and the lousy person is back were he started a month after an insecticide is used on him.

**Dr. Traub:** Dr. Gaon, has Yugoslavia stockpiled standby insecticides for use if lousiness becomes a problem and lice are found resistant to present insecticides?

**Dr. Gaon:** In Bosnia we use DDT since there are no DDT-resistant louse strains there, but elsewhere we have switched to malathion because DDT's use has been prohibited in agriculture and so it is not produced any more. We hope to use malathion for three to five years, then go to BHC for two or three years, then to pyrethrins with synergists, and later to carbaryl, and so on. All these insecticides are produced in Yugoslavia and readily available.

**Dr. Wisseman:** Would either Dr. Tarase-

vich or Dr. Balayeva like to comment about the state of louse-borne typhus in the Soviet Union today? And can either of you describe control measures that are or have been successful?

**Dr. Tarasevich:** Epidemic typhus decreased in the Soviet Union following World War II, and there have been no reports of typhus cases or epidemics in recent years. But we do still have some cases of Brill-Zinsser disease. Our department, headed by Professor Zdrodovsky, has collected and studied sera from patients and healthy people. Serologic observations show that antibodies persist in the sera of healthy people, but only in those aged 50 years or more, which indicates World War II typhus.

As to lousiness, the only lice we have now are head lice in small numbers of school children. Though some of our peoples follow traditional customs—in Central Asia, for example—everyone is able to change and wash his clothes; we have no situations such as

have been described in Burundi and Bolivia. Since there is no problem with body lice, perhaps we should pay attention to head lice as a possible vector of typhus.

In our country there are epidemiologic regional stations in the capitals of many constituent republics of the U.S.S.R., as well as in other cities and towns, and we have spring and autumn disinsection to lower populations of house parasites such as flies. We use DDT and other insecticides.

There was an outbreak of rickettsial pox in a small town in the Central Ukraine for a short time just after World War II. An epidemiologic team found about 1,000 cases there, after which an eradication program was started. Over two or three years medical technicians went from house to house and sprayed 10 per cent DDT dust on everything, and thereafter we were unable to find rats, mice, or their ectoparasites. There were a lot of cats and dogs in the town, and we found no parasites on them.