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The Secretary of the Expert Panel on Malaria has the honour to communicate hereunder the following note:

DO ANOPHELINES ACQUIRE RESISTANCE TO DDT ?

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In the year 1945 residual spraying with DDT was tried experimentally in Greece. The results achieved led to an immediate and radical modification of the anti-malaria programme conducted till that time in that country. Thus by 1946 a country-wide residual spraying programme was started, covering approximately a total population of five million living in the malarious areas. This programme since then was carried out without interruption up to 1950. The epidemiological data published on different occasions show that from the first year of operations, the trend of malaria manifested a remarkable decline, closely followed by a definite interruption of malaria transmission in the succeeding years. On the other hand, systematic searches of the vector species, A.elutus and A.superpictus, in sprayed premises gave constantly negative results whereas in unsprayed premises of sprayed areas, they revealed either a considerable reduction or were totally negative. Moreover, in many areas, as a result of the residual spraying, a definite reduction of the breeding of vectors was also noticed, especially in Attica and the Island of Crete. One single spray per year with a dose of 2.0 gr. per sq. meter was the practice adopted since the start of the spraying programme on a country-wide

*For reasons of economy, no translation made in French

scale. During the first year of operations, side by side with the disappearance of the anopheline population, all other domestic pests also disappeared from sprayed houses. In the following year (1947) a definite resistance of house-fly to DDT was first observed, and this fact was the cause of a great trouble to the public and a matter of great concern to the health authorities. In 1948 Culex autogenicus showed a definite resistance to DDT and in the same year the first apprehensions about a resistance acquired by fleas, which ever since the beginning of the campaign had totally disappeared from rural areas, arose. In 1949 resistance of fleas was well-established and the same phenomenon was generally noticed with bed-bugs as well.

The above disquieting facts, as is natural, drew in time our careful attention towards the anopheline vector species, inasmuch as since 1949 an unusual number of positive anopheline catches was reported in a sprayed area lying near the Albania border. In the spring of 1951, owing to lack of sufficient amount of DDT, we were compelled to exclude from the spraying programme, for the first time since 1946, two districts of the country, i.e. Peloponnesus and Crete with a total population of 1,800,000 approximately and 1,800 villages, sprayed in the previous years. At the same time systematic epidemiological investigations were intensified in these two districts in order to be able to intervene in due time in the event of an emergency. In this programme the study of a possible acquired resistance of vector species was also included. The assumption by the writer in August of his new duties as WHO Regional Adviser impeded the close follow up of the observations started on this subject. However, the data already collected from the field give rise to serious apprehensions. According to these data, in some sprayed villages of Peloponnesus, high densities of vector species were found some time after spraying. Thus in a village of Laconia where the appearance of high vector densities suggested an immediate spray in 26 July 1951, 2,040 specimens of A. elutus were caught in a routine search at 4 catching stations two months after spraying. In other villages 32 days after the spraying, undertaken in similar circumstances, 523 specimen of A. elutus were caught in 6 catching stations, and in another instance, 199 specimen of A. elutus were caught in 8 catching stations only 11 days after spraying. In a number of other villages, more or less the same conditions were encountered. According to information received from some very reliable malaria inspectors working in the field, a significant number of the vectors caught under similar circumstances were able to survive and lay eggs which later hatched to larvae.

It appears that the phenomenon observed in some regions of Greece during the current year in regard to anopheles vectors is, in some respects, of the same character as the phenomenon observed in connexion with house flies in 1947, and later with other domestic pests. Although the information given above is very general and still incomplete, and consequently any speedy conclusion must be carefully avoided, I thought that it would not be aimless to present this fact. Considering that the bell of danger has rung in other places also, I believe the subject is one which merits careful consideration. A timely study of the problem is likely to prevent eventual calamities, especially in such cases where the amount of immunity of the population has been greatly reduced as a result of residual spraying operations carried out for a certain period of years.