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THE YEARS SPENT BY TIBOR JERMY ACADEMICIAN IN KESZTHELY (1952–1967)

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PRELIMINARIES

The first occurrence of the Colorado potato beetle (*Leptinotarsa decemlineata*) at Hédervár (Győr County) in 1947 gave impetus to zoological research in Hungary. TIBOR JERMY having returned from captivity on 10 July 1947 was commissioned by the Plant Protection Service of the Ministry of Agriculture to investigate the new pest.

Following its first appearance the pest spread rapidly. At the beginning, it occupied South-Transdanubia, afterward the whole country.

The Zoological Section of the Research Institute of Plant Protection (Budapest) where TIBOR JERMY was nominated for a post in 1949, operated a temporary laboratory in Zalaegerszeg in the summer of 1951 completed with a mobile laboratory mounted on a microbus as suggested and planned by JERMY. With this mobile laboratory the research workers sought out the infested areas and recorded the number of the individuals in different development stages found there. Then they made proposals for the method of control (collecting by hand if the larvae or adults were few; carbon bisulphide (CS_2) to destroy the pupae in the soil; finally, in the case of a large number of larvae and adults dusting or spraying with some pesticide containing DDT or HCH).

THE WORK IN KESZTHELY

The material of the Zalaegerszeg laboratory was transferred on 2 May 1952 to Keszthely, to a glasshouse in the former Festetics garden (Georgikon garden) transformed for entomological purposes (Figs 1–5). In this simple laboratory TIBOR JERMY and GYULA SÁRINGER, for the first time in the world, started investigations on the diapause of *L. decemlineata*.

Making use of the new possibilities offered by the available experimental areas with large numbers of various insect pests, experiments began here. Starting from experience obtained in the course of series of breeding, experimental insect

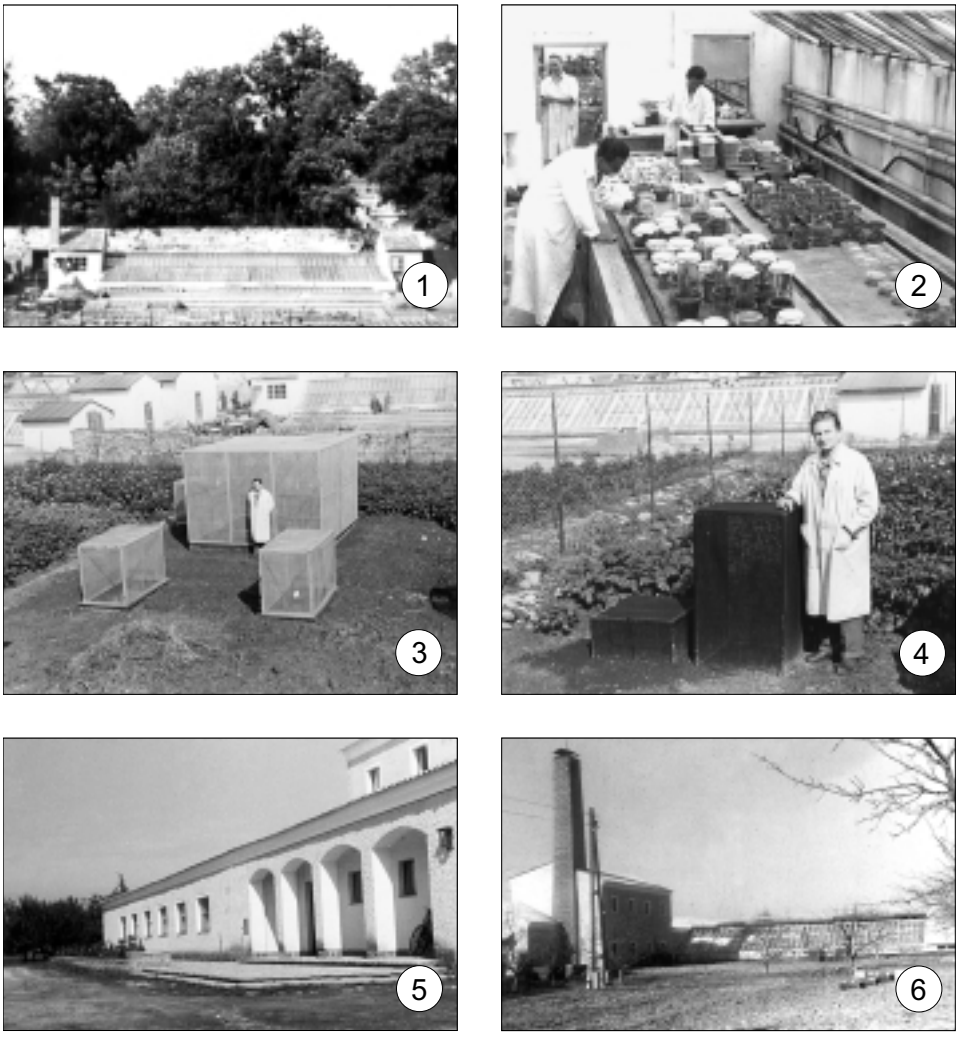

Fig. 1. Temporary greenhouse laboratory in Keszthely in the Georgikon garden (Photo: SÁRINGER, G.)

Fig. 2. Inner space of the temporary greenhouse laboratory (Photo: MÓCZÁR, L.)

Fig. 3. Wire cages for rearing insects in the Georgikon garden (Photo: JERMY, T.)

Fig. 4. Cages for the overwintering of *L. decemlineata* (Photo: JERMY, T.)

Fig. 5. Main building of the new laboratory in Keszthely (Vásártér) (Photo: SÁRINGER, G.)

Fig. 6. A greenhouse of the new laboratory (Photo: SÁRINGER, G.)

ecological research was initiated in Hungary. Compared with the earlier research methods, this meant a real paradigm shift. (On the paradigm see KUHN (1970).)

The glasshouse laboratory in the Georgikon garden functioned until the end of 1957. At a congress held in Moscow in 1954 the socialist countries of that time passed a resolution that the countries infested with *L. decemlineata*, i.e. the German Democratic Republic, Poland and Hungary should establish laboratories specially engaged in *L. decemlineata* research for a specific purpose: results obtained should prevent the dangerous pest from spreading eastward. Those who knew the relevant international literature were fully aware that the eastward invasion of the pest could not be arrested. On JERMY's suggestion the Ministry of Agriculture chose Keszthely as the place where the new laboratory was to be built up, since the Agricultural Academy founded by GYÖRGY FESTETICS in 1797, as well as the West-Transdanubian Agricultural Research Institute also functioned there.

On 2 May 1955 the foundation-stone of the new laboratory was laid in a 4.4 ha mixed orchard at the Vásártér (Keszthely). The ground-plan of building was prepared by ÉVA B. MUELLER, architect, on the basis of JERMY's motions. The building was executed by the State Building Company of Zala County. Owing to the 1956 fight for freedom research work in the new laboratory began only on 9 January 1958. Between 1952 and 1967 TIBOR JERMY worked in the laboratory from early in May to the beginning of September, that is, he spent the growing season in Keszthely. The laboratory was given the name: Keszthely Laboratory of the Research Institute for Plant Protection, Budapest.

The laboratory consisted of 4 work-rooms, 1 photo laboratory, 1 scullery, 3 rooms with controlled temperature, and two 25 × 5 m greenhouses half sunk in the soil, closely attached to the building in west-east direction (Figs 6 and 7). The southern wing of the building was two-storeyed with 2 guest rooms (4 beds) and a shower stall. One of the guest rooms was occupied by TIBOR JERMY and his wife (Fig. 8). For research, it was a great advantage to live next door to the laboratory. In the building, there was a toxicological laboratory opening from outside, where the action of imported pesticides and those produced by domestic factories were studied. The building also contained a room with separate entrance for poisons, a garage and a workshop. At a distance of about 15 m from the building there was a three-room official residence where from 15 October 1956 GYULA SÁRINGER lived with his family.

The controlled temperature rooms were the most valuable rooms of the laboratory. In each room there were 5 so called "photoboxes" adjustable to different day-lengths making the examination of the role of photoperiod possible.

Since the laboratory was surrounded by an orchard, it seemed reasonable for JERMY to examine pests of great economic importance (e.g., *Cydia pomonella*) besides *L. decemlineata*.

The first results of the *L. decemlineata* research were published in 1951 (JERMY 1951). This paper summarized the data of the experiments at Hédervár.

The first summary of *L. decemlineata* investigations carried out in Keszthely is found in the monograph (JERMY & SÁRINGER 1955*a*). This work also contains results of some importance published in the relevant international literature. The work has been translated into German, Polish and Russian as well.

In Keszthely again the diapause of *L. decemlineata* was the first subject we were concerned with. The results are contained in JERMY and SÁRINGER (1956).

According to the data of foreign literature published before the investigations started in Keszthely, it was the senescence of the foliage of potato as a food plant that caused the diapause. At the beginning of August when the foliage of potato began to dry up JERMY fed the young adults with leaves grown from freshly germinated tubers and found that they went into diapause after feeding for 13–14 days. This gave us the idea that something else besides the quality of the food plant was behind the phenomenon. After various possibilities had been taken into consideration, the photoperiod as an abiotic factor remained the only possible reason for beetles entering diapause. The subsequent photoperiod experiments resulted in the above cited paper published in German. At that time it was a conception of so great importance that DE WILDE, J., president of the Holland Royal Academy came to Keszthely and asked me: "when did you realize that the photoperiod was the factor that determined the diapause of *L. decemlineata*?" I answered: "It was in 1952–53. Then you come first, because I found it out only in 1954" – he remarked. However, under the difficult conditions of that time our paper appeared only in 1956. Books and papers on the diapause of *L. decemlineata* have ever since cited the above work.

When the *L. decemlineata* settled finally in Hungary the question of studying the possibility of biological control arose. As the course of development of the pest was known by then, the difficulties of the biological control became clear. Those interested in the subject can find detailed information in the paper JERMY and SÁRINGER (1955*b*).

In the first half of the fifties JERMY's interest turned toward the science of zoocenology. His interest was aroused by the book of BALOGH (1953). Reading the book he made about 50 pages of comments on it and sent them to professor BALOGH, who revised his work accordingly and published it under a new title: Lebensgemeinschaften der Landtiere. Ihre Erforschung unter besonderer Berüchsichtigung der zoocönologischen Arbeitsmethoden. Akademie-Verlag, Budapest–Berlin in 1958 on 560 pages. JERMY's thoughts concerning the subject were published in JERMY (1955).

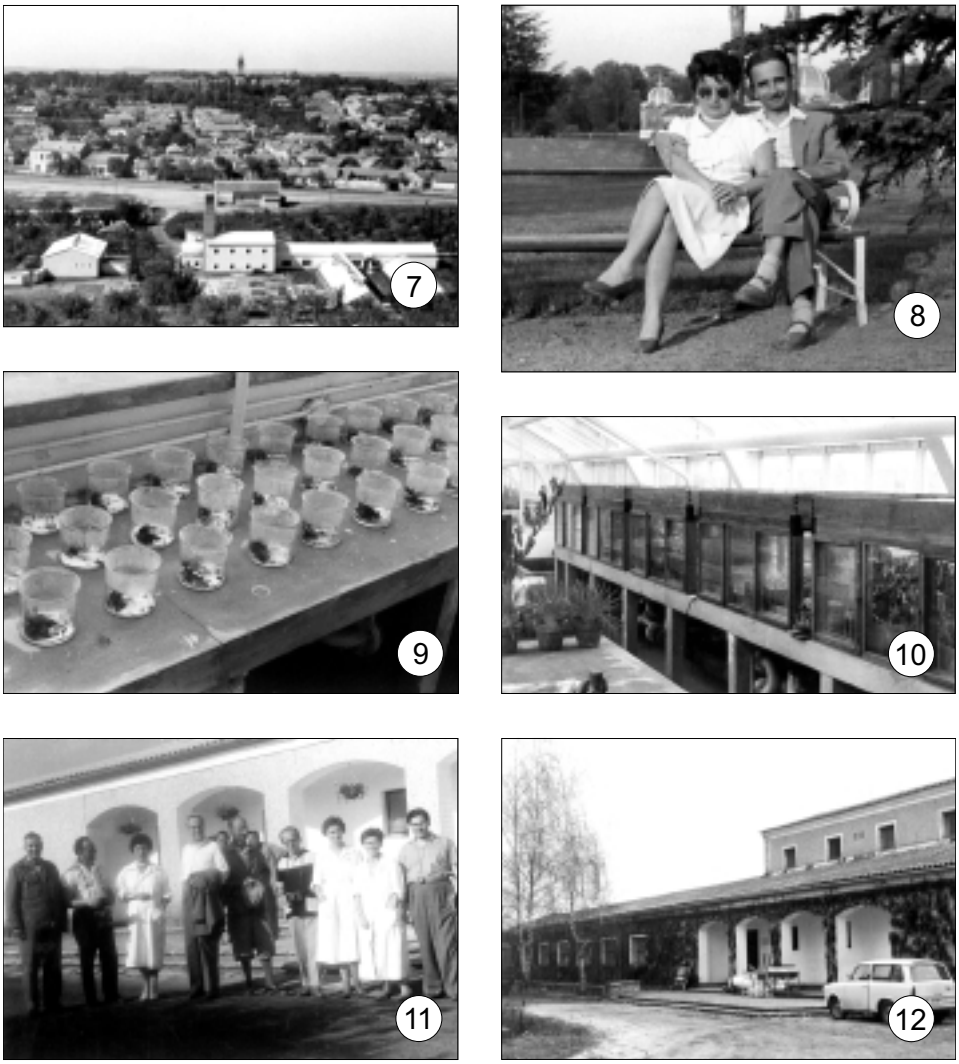

Fig. 7. The new laboratory with official residence as seen from the tower of the Karmelita church (Photo: JERMY, T.)

Fig. 8. TIBOR JERMY and his wife at Héviz (Photo: not known)

Fig. 9. Mass cultures of *Perillus bioculatus* F. on the table of the glasshouse laboratory (Photo: SÁRINGER, G.)

Fig. 10. Mass cultures of *Leptinotarsa decemlineata* SAY on the table of the greenhouse laboratory (Photo: SÁRINGER, G.)

Fig. 11. Some of the numerous foreign visitors (From the left: MANOLACHE, LEBERRE, Ms. JERMY, GHILAROV, BERZSENYI-JANOSITS, CANIA, Ms. DERGOVICS, Ms. SÁRINGER, (Photo: SÁRINGER, G.)

Fig. 12. The laboratory on 17 December, 1977 while cleared (Photo: SÁRINGER, G.)

In the mid-fifties, the cenological view gained ground in the treatment of agricultural zoology subjects too. The paper of JERMY (1956) was written on this subject.

JERMY investigated the zoocenoses from the point of view of production biology as well. The results are summarized in JERMY (1957a).

The *L. decemlineata*, as an animal relatively easy to breed in laboratory, offered opportunity to TIBOR JERMY to set about investigations on the food specialization of insects. He started from the working hypothesis that the relation between an insect pest and its food plant could somehow be disturbed. In experiments carried out with insects he succeeded in inhibiting the effect of stimulants eliciting the feeding reflexes of insects with various substances (e.g., copper compounds, solutions of various alkaloids, sodium tartarate solution). He found out that the resistance to *L. decemlineata* of the different plants could be traced back either to the presence of substances inhibiting the feeding reflexes (e.g., in the case of *Nicandra physaloides*) or to the absence of feeding stimulants (e.g., in the case of *Galinsoga parviflora*). The results are summarized in JERMY (1957*b*). The same subject is treated in the following works: JERMY (1961*a*, 1966), JERMY and MATOLCSY (1967), MATOLCSY *et al.* (1968).

TIBOR JERMY was the first in the world to critically examine the concept of "biological balance". His starting point was that in a given biocenosis this concept could not exactly be defined. His ideas can be read in his paper (JERMY 1957*c*) regrettably published only in Hungarian language.

Of the problems of the production biology of terrestrial biocenoses JERMY gave an account again at the end of the 1950's (JERMY 1958*a*, 1959).

In the late fifties, when hot debates were going on in Hungary between JÁNOS BALOGH professor and GUSZTÁV SZELÉNYI, head of the Department of Zoology of the Plant Protection Institute, on the question of biocenology, was the pioneer work of JERMY and SZELÉNYI (1958) published.

In the same period JERMY summarized his investigations concerning food finding and food choice by *L. decemlineata*, as a result of experiment series carried out in several repetitions in the Keszthely laboratory (JERMY 1958*b*). A paper on the Hungarian food plants of *L. decemlineata* prepared on the basis of exhaustive study by JERMY and SÁRINGER (1959) also appeared in that period.

In the early 1960's further important works gave accounts of JERMY's experiments on the food specialization of insects (JERMY 1961*b, c*).

Pioneer experiments were conducted concerning the orientation of phytophagous insects related with the incidence of the solar radiation. With the aid of a simple swivel chair JERMY pointed out that the *L. decemlineata* always advanced

at a certain angle to the solar ray. In cloudy weather the polarized light helped the insect in orientating. This is the subject of the paper JERMY (1961*d*).

JERMY's investigation on the swarming of insects flying to light, and the realization of his ideas about light-traps came out at the beginning of the 1960's. The first light-trap was set up in 1955 in front of the glasshouse laboratory of the Georgikon Garden (Fig. 1). Seeing the favourable result, he advised setting up light-traps at various sites in the country. The data from this light trapping were worked up in the Hungarian Natural History Museum (Budapest) under the guidance of LAJOS KOVÁCS, lepidopterologist. JERMY's first work on this subject was: JERMY (1961*e*).

On the difficulties of the biological control of *L. decemlineata* we already wrote with TIBOR JERMY a paper at the end of the 1950's. In the same period of time the idea of biological control was again put on the agenda. Prof. Dr. F. M. FRANZ, (Darmstadt) institute leader, brought the carnivorous plant bug *Perillus bioculatus* F. from the USA into Europe. TIBOR JERMY began collaborating with the professor and acquired the bug for the Keszthely laboratory. Egg groups were regularly sent from Darmstadt to Keszthely where they were multiplied (Figs 9–10). The examinations began in 1959. At first, ecological and ethological examinations were carried out. It was found that the bug population placed in the open rapidly dispersed; this showed that the species could be settled only with a large number of individuals placed out. At an international conference held in Czechoslovakia (Smolenice) in September 1962 TIBOR JERMY suggested releasing the larvae obtained from egg groups of *Perillus* bred in the different countries in a single place. Hungary was the country chosen for this purpose, so the egg material came to Keszthely from Belgium, Czechoslovakia, France, Poland, the German Democratic Republic, the German Federal Republic and the Soviet Union. The larvae were released in spring 1964 and 1965 in a severely infected potato field of half of a ha between Keszthely and Fenékpuszta. In the first year 41,831, in the second year 57,633 bug larvae were released. At the site of release and in the neighbourhood not a single overwintered adult was found in the following years. The causes of the prospective failure were indicated by JERMY (JERMY 1962*a*). Further works in this subject are: JERMY (1962*b, c, d*).

Besides the *Perillus* work, TIBOR JERMY started experiments in 1964 with the introduction of *Prospaltella perniciosa* Tower. He thought this parasitoid would be successful against the scale, *Quadraspidiotus perniciosus*, but the experiments gave negative results (JERMY 1967*a*).

From an autoecological point of view, the differences between the temperature at the four cardinal points of the apple-tree are of special importance. The rate of development of *Cydia pomonella* larvae greatly varies according to the side of

the tree where the larvae develop in the apples. The results of the studies on this are contained in the paper JERMY (1964).

Experiments with the sterile male control method, one of the autocide methods, began in the mid-sixties in Hungary. In the Keszthely laboratory, TIBOR JERMY started experiments in this subject with *Cydia pomonella*. The basic condition of the method was the mass production of *C. pomonella* pupae. This required a knowledge of how to stop the diapause of *C. pomonella*. In his experiments JERMY found that the larvae raised under long-day (L:D/17:7) conditions continued developing without diapause. The results of the experiment are found in JERMY (1967*b*).

Besides, the above activities pursued in the Keszthely laboratory TIBOR JERMY was occupied with many minor subjects.

In connection with subjects of higher importance JERMY established contact with many internationally known researcher, European and American scientists of fame visited the laboratory. Some of them even spent months there. Several names from the visitors' book of the laboratory: GHILAROV (1960 Soviet Union), MANOLACHE (1960 Rumania), LABEYRIE (1960 France), SCHWARZ (1961 GDR), ABO-ELGHAR (1963 Egypt), LEBERRE (1964 France), BILIOTTI (1964 France), MOREAU (1964 France) HUBA and JASIČ (1964 Czechoslovakia), SZMIDT (1964 Poland), MOENS (1964 Belgium), OKÁLI (1965 Czechoslovakia), ČAMPRAG (1966 Yugoslavia), CANIA (1967 Poland), BUTT (1971 USA), ALI (1971–74 Egypt), WAHEEB (1973–77 Egypt), HAFEZ (1973 Egypt), YADAR (1972 India), SCHMELZER (1973 GDR), DE WILDE (1973 the Netherlands), WETZEL (1974 GDR) (Fig. 11).

A few words must be said about TIBOR JERMY's working method. He was the one who elaborated the technique of mass breeding for experiments (Fig. 9). The cages and equipments (Fig. 10) required were fabricated under his guidance by the unforgettable jack-of-all-trades GYÖRGY HAJDÚ. Since the beginning, JERMY used statistical methods to evaluate experimental results.

It was in the Keszthely laboratory planned by TIBOR JERMY that the discipline of "experimental insect ecology" came into life in Hungary; it had influence on the research of agricultural entomology all over the country. The results attained in the laboratory led to international appreciation.

I think that for the work in the Keszthely laboratory from 1952 to 1977 TIBOR JERMY deserves permanent credit. The 15 years spent by him always in the laboratory during the growing season will be written in gold letters in the history of agricultural entomology in Hungary.

The Keszthely laboratory planned by him closed down on 31 December 1977 (Fig. 12).

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