RESEARCH INTO THE LIFE OF THE TISZA
CONFERENCE ON TISZA RESEARCH IN 1973

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In recent years it has become customary to hold a Tisza Research Conference, and such a conference was again held in 1973. This took place on 28 April, in the Assembly Hall of the Club-house of the Academy Committee in Szeged, with a total of 12 lectures. The topics varied from regional ecological problems of the Tisza valley to research into micro- and macrovegetation, and from the zooplankton to an account of the mammalian fauna of this valley.

Below are given brief summaries of the individual lectures and the contributed comments. (Those lectures which have since been published are indicated only by their titles.)

After the chairman's address by Dr. IMRE HORVÁTH, the lecture series began with a topic from the field of natural geography.

1. M. ANDÓ:

Regional ecological conditions of the Region-Conservation District at Mártély—Körtvélyes

The Mártély—Sasér area consists of homologous ecological facies closely connected to each other genetically, and of a group of these. In a regional sense the area forms part of the South Tisza valley, where only a small proportion of the homologous facies groups have remained in their natural state, the natural ecotope ghoup; here too in the bulk there are many close-lying economic ecotopes affected by anthropogenic activity. In the examination of the regions consisting of the various ecotypes in the course of the research into the regional areal elements it is also necessary to explain and investigate the natural and social-historical aspects, for in a geographical environment transformed to a considerable extent by the social-economic activity the natural factors similarly act to a changed extent and at a different rate.

Since this area has been increasingly under the effects of human activity since the turn of the century, the results of anthropogenic activity frequently fuse units differing ecologically from one another, possibly into a uniform areal type. (For example, the flood-free meadows transformed to plough-land have merged already ecologically with the cultivated steppe-meadows.)

One such ecological type is provided by the economically cultivated areas (ploughland) on the flood-land. The plough-land occupies about 10% of the area

of the district, and lies mainly on the backs of the riverside dunes on the higher parts of the flood-land. Nowadays these areas to a considerable extent already possess an excellent soil structure. The character of the soil is developing from the meadow irrigation to the open country soil type.

Prior to the flood-water regulation these parts were not covered by flood-water. They have been inundated only since the construction of the embankment systems. In the course of the surface development here a complex of ecotypes differing sharply from the aquatic environment can be observed in the case of the soil and the individual surface substrates.

The effects of human activity are less significant on the areas of the flood-area grassy surfaces (meadows, pastures). The flood-area meadows occur sporadically. A larger unified area is observed in the region of Körtvélyes and on the widened flood-land lying to the south of this. In certain places the grassy surfaces are utilized for pasturing and for hay-making, but complex pasture and meadow farming does not take place on them at all. As a consequence the interactions of the natural processes now taking place proceed relatively naturally in the stock types of the individual grass vegetations.

As regards the open-country (meadow and flood-area pastures) ecotypes it can be noted that the mutual correlations of the natural geographical factors are sharply reflected in the individual qualitative and quantitative features. For example, the micro-relief of the terrain and the related hydrological conditions stand out significantly in the composition of the vegetation.

Since the flood-plain of the Tisza is involved, one might think that the water is not a problem here. It can be proved, however, that the flood-area is one of those areal groups where there is at times plenty of water, but at other times only a little, i.e. as regards the water-household it can be classified as very extreme. To outline briefly the hydrogeographic conditions (one of the most decisive factors here) on the area of the flood-land, it may be stated that the state of the layer-water below the flood-plain surface varies in parallel with the water-level in the living river. Since the water-level of the Tisza is low, particularly in the vegetation period, it follows that the soil-water too lies deep down below the level of the terrain. The soil-water level of the flood-plain is not raised either by the soil-water flowing in from the area of the Hungarian Plain, since the flood-land environment lying outside the embankment systems is 2—3 metres lower on average than the flood-area level. Consequently, the soil-water flowing into the valley of the Tisza runs off to a considerable extent by flowing down from the surface via the drainage channels, and passes directly into the living river. As a result of the water-sealing effect of the deposit of the flood-area surface, the precipitation falling on the surface flows off predominantly on the surface. This quantity of water does not reach the level of the soil-water either, so that the local precipitation does not mean a replacement either for the soil-water reserve of the flood-plain. In contrast, it frequently occurs that surface waters form on the occasions of heavier precipitations in the low spots of the flood-plain; these evaporate rapidly in the summer period, and hence the water-vapour content of the air of the flood-plain increases. Particularly on the flood-area meadows it is possible to find surface water which are relatively well-protected from the wind among the woods of the flood-plain. Favourable moisture conditions develop on such type of meadow and open-country ecotopes, as observed on meadows outside the flood-area. Where the meadows are not protected from the wind there is a difference of 10—15% in the humidity content in the flood-plain too.

In the flood-plain perhaps one of the most significant natural and anthropogenic ecotope groups is the flood-area wood population. On the Mártély—Sasér flood-plain this ecotype exhibits a considerable heterogeneity in the non-distribution of the species (from the plane tree to the willow). The appreciable effect of the anthropogenic factor is reflected by the colony types, which can not always be brought into correlation with the relief of the terrain and with the other natural features.

However, on this area there are also small woods remaining, where the state before the flood-water is reflected, i.e. as a consequence of the current natural factors characteristic forms are developing, which differ from the anthropogenic ecotopes. Such, for instance, are the wood populations to be found on the deeper parts lying between oxbow-lakes, or the oxbow lakes themselves on partially filling marsh-land.

Since 75% of the surface of the area is covered by woods, the work already carried out as regards the terrain investigations has been concentrated on the study of the woodland ecotopes. During the past 20 years a terrain investigation has been performed in a cross-section of the Tisza flood-plain at Algyő, Sasér, Ludvár and Körtvélyes.

The natural and artificial wood population of the flood-plain serves to decrease the force and rate of the flood-wave. Consequently, the possibilities of the danger of flooding in Szeged and its district are reduced. This is of particular importance when the flood-wave of the Tisza coincides with that of the Maros. In order to avoid this situation completely, anthropogenic intervention has been performed to produce woods on the flood-plain.

In the flood-area wooded environment developed since the turn of the century numerous residual ecotypes are encountered, where the natural geographical processes are being considerably enhanced and the anthropogenic effects are decreasing. Such areas are the standing-water surfaces of the oxbow-lakes, and the areas of the partially filled oxbox-lake marshes.

Contributions to the discussion:

B. Szőkefalvi-Nagy: The scientific work is an aid to raising the level of tourism, and is an effective supporter of conservation of the biosphere (pollution, biological equilibrium, etc.).

I. Kiss: Attention is drawn to the connection between flood-defence work and sodification: the dangers of breaks in embankments and inundation by water because of embankments constructed from sodic soil.

Gy. Bodrogközy: The regional ecological examinations provide a good basis for other biological researches. The maps prepared are considered of particular value. However, a survey of the soil-geographical development is required.

M. Marián: The preparation of the maps should be continued. The occurrence of Trochosa singoriensis at Mártély had become understandable; this species could maintain itself only on a dry island before the regulation too. In connection with the drying-out of the flood-area grove-woods, the destructive activity of man was suggested.

The lecturer's reply: He wished to give a soil-ecological picture, with special regard to the perspective anthropogenic effects.

2. T. Kiss Keve:

Conditions of the development of plankton algae population maxima in the Eastern Main Canal and the Tisza

In the Eastern Main Canal, where a water-purification plant is being built, a particular worry at the time of the plankton algae population maxima is the ensuring of drinking-water of good quality. The algae may give rise to taste and smell problems,

and may make filtration difficult. Accordingly, it is important to examine those factors which affect the rapid multiplication of the phytoplankton.

The development of a population maximum characterized by a dominance of *Cyclotella* has been observed at the beginning of the year in every year since 1969 in the Eastern Main Canal. The main constituents of the algal association were *Cyclotella kützingiana* and *Cyclotella meneghiniana*.

The spring silicaceous-algae maximum has been described by very many authors, primarily from lakes. In their view a significant factor in the development of the diatom maxima is that during the winter the phosphorus, nitrate and silicate accumulate in the water; the amounts of these decrease in parallel with the rapid multiplication of the algae. Other essential factors are considered to be increasing water temperature and the light.

There are no exact data with regard to the phosphorus, nitrogen and silicate contents of the Eastern Main Canal; it is assumed merely that they must be present in concentrations favourable for a *Cyclotella* maximum.

The role of temperature in the canal has not been clarified completely. In some cases the temperature of the water increased in parallel with a rapid multiplication of the algae (in 1969 from 6 to 9.5 °C; in 1970 from 3 to 8 °C; in the period 15—29 March 1971 the water-temperature rose from 2.7 to 9.8 °C, while the number of algae increased from 50—100 thousand to 1000—8000 thousand individuals per litre). At other times, however, the temperature fell when the maximum was developing.

In the case of the Eastern Main Canal it was observed that an important role is played in the development of the plankton algae population maximum by the light conditions prevailing in the water. *Cyclotella* maxima develop only when the suspended-matter content is low, the turbity of the water is low (a turbidity less than 3 mg mastix per litre), and the translucence is high.

Contribution to the discussion:

M. ANDÓ: How was the translucence of the water measured?
The lecturer's reply: A selenium-cell luxmeter was employed.

3. G. UHERKOVICH:

The occurrence of *Biddulphia levis* EHRBG. in the Tisza

(Because of the absence of the author, the lecture was read by Dr. M. MARIÁN.)

The *Biddulphia* (GRAY 1831) silicaceous alga family contains about 100 species. The majority of these are marine organisms, and some of them also pass over into brackish water. There are also two species in the family which at times pass over from brackish water into fresh water, but these occurrences can not be regarded as typical fresh-water occurrences.

One of these *Biddulphia* species which has also been observed in a few cases in "fresh water" is *Biddulphia levis* EHRBG. This organism has been found in the Tisza too. The author has found it on threads of the characteristic red alga of the Tisza, *Thorea ramosissima* BORY, colonized directly below the water-line on floating objects at Szeged.

A closer ecological analysis of the habitat revealed the following: The water of the Maros has an NaCl content far in excess of the fresh-water average (expressed

as Cl ion, it is generally 150—230 mg/l). As a result of this high content in the Maros, the NaCl content of the Tisza too rises below the mouth of the Maros, and at Szeged has a value of 90—120 mg/l (expressed as Cl ion). The high NaCl content compared with other fresh waters is one of the reasons for the occurrence of *Biddulphia* here. Nevertheless, in itself the NaCl concentration would not be enough to explain the occurrence of *Biddulphia.*

As regards the oxygen and other dissolved substances, it has long been shown that the lower concentrations of certain substances in river water is sufficient to satisfy the special demands of living species, for fresh doses of these substances can be taken up continuously from the river water flowing past the body surface. Thus, the river water may represent physiologically higher concentrations of certain substances than standing water containing the same concentrations. In the present case too the not insignificant NaCl content corresponds to a physiologically higher concentration. Further, the presence of the halophyton *Nitzschia filiformis* (W. SMITH) HUST. of the other silicaceous algae, living adhering on the assimilation hairs of the Szeged Thorea ramosissima, indicates that this biotope with its characteristic ecology is to be regarded physiologically as a limiting case in a certain respect of the fresh-water biotopes.

Contribution to the lecture:

I. KISS: The speaker gave an account of and praised the book of Gábor Uherkovich: The phytoseston of the Tisza. This book summarizes the results of 10 years' alga research. It is a work striving for completeness, and lays claim to international interest too. The results of examinations along the length-profile of the Tisza are compared with the data for other Central European rivers.

4. L. GALLÉ:

Plant ecological and teratological observations on the flood-areas of the Tisza

A certain correlation can be established between the floodings, the artificial irrigations and the occurrence of the teratological phenomena. Most plants do not benefit from a prolonged period of inundation, and those organs which developed in the dry are not developed further. Primarily the leaves are destroyed. As a consequence of the inundation, however, it is possible to observe the teratologic change not only of the leaves, but also of the flowers, which tend to turn green (chlorantia). In this phenomenon the petals may be transformed to upper leaves or broad leaves, but every part of the flower may appear in the form of green leaf structures.

The chlorantia can be well observed in *Ranunculus sceleratus, Limosella aquatica, Bidnes tripartitus, Potentilla supina, Juncus bufonius* and *Cyperus fuscus,* and in *Senecio vulgaris* may sometimes attain nearly 50%.

In flooding areas other abnormalities too can occur: e.g. twin-leaves and ascidia in *Euphorbia* and *E. virgata*; many scapus-fasciato in the *Taraxacum* family; twin-leaves in *Xanthium strumarium* and *Salix alba*×*triandra* hybrid; twin-flowers in *Malva silvestris* and double, imparripinate leaves in *Fraxinus pennsylvanica.*

As the inducing factors, mention may be made of the qualitative and quantitative changes in the nutriments as a result of the inundation; the changes in the physiological state of the plants; and secondary virus infections.

Contribution to the discussion:

I. HORVÁTH: In the case of the teratologic changes, does the function play a primary or a secondary role, and is it a matter of nutriment enrichment?

The lecturer's reply: The abnormalities are caused by chromosome aberrations and polyploidy but the effects of the nutritional factors are beyond doubt. The fact of the inundation is considered to be a strongly-acting factor.

5. GY. BODROGKÖZY and I. HORVÁTH:

Production examinations on the hayfields of the Mártély—Körtvélyes Region-Conservation District

Contributions to the discussion:

M. ANDÓ: Does the plant production vary in time (compared to the 1950 data)?

I. KISS: Attention is drawn to the fact that examination of the root mass is of importance as regards production biology (N equilibrium).

The lecturer's reply: The interaction of the relief conditions and the vegetation is beyond doubt. There was not an extensive change during the past 20 years, but a new survey would be necessary to record the certain shifts.

6. M. MARIÁN:

The present state of the zoological research in the Region-Conservation District at Mártély—Körtvélyes

A survey is given of the results and problems of the zoologists of the Tisza-Research Working Committee who are carrying out research in this region. The basic aim is the ecological faunistic elucidation of the district, in the interest of the future zoological reconstruction. These examinations will be followed by production-biological, ethological and other researches.

At present 13 specialists are studying 16 systematic groups or zoocoenoses (Zooplankton, Benthos, Collembola, Ephemeroptera, Odonata, Plecoptera, Orthoptera, Formicoidea, Rhynchota, Lepidoptera, Oribatiformes, Pisces, Amphibia, Reptilia, Aves, Mammalia).

From a comparison of the supply of specialists in the Working Committee and the number of taxonomic units and zoocoenoses investigated with the corresponding data for other research communities, it is found that Szeged is in a much better position than the Hungarian Danube Research Station or the Sodic Working Community of the SZAB, but from such an aspect the situation is not so good as in the Bakony Research Working Community, where more specialists carry out research in more directions.

90% of the work of the researches is restricted to Körtvélyes island. Investigations must be extended to the Barc meadow, to Kutyafenék and to Mártély island.

How much progress has been made by the ecological and faunistic research? From the reports given it has turned out that the working group can give a fauna list on 8 systematic groups, and similarly 8 investigators can characterize the zoospecies of their special fields from a zoogeographical point of view.

For the time being some interesting contradictions appear in the results: some investigators emphasize that hill-living species are not found; in contrast, others stress that the fauna of the area examined exhibits many related features to those of the Upper Tisza fauna. It turns out from all this that many investigations will

be required before the Working Community can make a satisfactory proposal with regard to the fauna reconstruction.

To summarize, it is stated that, with the exception of one or two systematic groups, the study of the essential taxonomic units has begun well. It is proposed that the present year is an exceptional one, when the spring flood-water did not cover the flood-plain, and should be well utilized for research. In this "dry" year a significant proportion of the fauna will regenerate well. Thus, the examination results can be usefully compared in the future with the results of the normal "flood-water years".

Contributions to the discussion:

D. GÁL: As supplementation it is reported that Dr. LÁSZLÓ MÓCZÁR too is making collections.
M. FERENCZ: The question of the necessity of water-chemical examinations is raised, this being closely connected with water-pollution problems.
K. KISS: In addition to water-chemical examinations, investigations of the phytoplankton too are considered necessary.
S. TÓTH: A complex entomological collection is considered useful. Attention is drawn to the fact that Coleoptera trapping would be necessary.
L. GALLÉ: Seasonal entomological collection is considered important, all the more so since new data can be expected in this field (see Á. UHERKOVICH who described a new butterfly subspecies from this area).
I. DOSZTÁL: Offers his help in the carrying-out of water-chemical examinations.
I. HORVÁTH: Similar surveys are seen to be very useful, all the more so since in this way the tasks of the future can be laid down.
The lecturer's reply: The water-chemical examinations have not been solved for the moment (perspective: assistance from water-conservancy and Dosztál). The participation of specialists in the entomological collections is considered useful.

7. D. GÁL:

Zooplankton of the Dead-Tisza at Körtvélyes in 1972

From February until November 1972 zooplankton collections were made monthly from 3 points of the Dead-Tisza at Körtvélyes. From February until May the total zooplankton amount increases steadily (from 8900 to 64,200 individuals per 10 litres). In May it attains the maximum, and then decreases continuously to nearly half (37,800 individuals per 10 litres). In October the total number of individuals increases somewhat (51,100 per 10 litres), and then again decreases in November.

With the exception of April, the Rotatoria species always dominate as regards both the number of species in the zooplankton and the number of individuals. The Protozoa are generally low, while the Entomostraca family appears with moderate numbers of species and individuals.

The species characteristic of the dead-arm, and occurring most frequently, in the highest numbers of individuals, are as follows:

Protozoa: *Arcella discoides* EHRENBERG, *Difflugia globulosa* DUJARDIN, *Centropyxis aculeata* EHRENBERG, *Centropyxis constricta* DEFLANDRE, *Codonella cratera* LEIDY, *Vorticella campanula* EHRENBERG, *Stylonychia mytilus* EHRENBERG.

Rotatoria: *Polyarthra vulgaris* CARLIN, *Keratella cochlearis* GOSSE, *Brachionus angularis* GOSSE, *Lecane luna* MÜLLER.

Entomostraca: *Moina rectirostris* LEYDI, *Bosmina longirostris*-typica MÜLLER, *Chydorus sphaericus* MÜLLER, *Megacyclops viridis* JURINE.

In the course of the year the saprobiological quality of the water also changed substantially. From February until May the oligosaprobe and beta mesosaprobe

species dominate (o—b: 43.5%, b: 38.9%), while the beta—alpha-mesosaprobe species are present to a much lower extent (13.9%). In the summer months the quality of the water progressively worsens, and the numbers of individuals and species characteristic of beta—alpha-mesosaprobe water increase. The quality of the water in the dead-arm is worst in August, when the total number of individuals of the oligo—beta-mesosaprobe species decreases (32.7%), and in their place appear the beta—alpha-mesosaprobe species, in higher numbers of individuals (27.8%).

Contributions to the discussion:

GY. CSIZMAZIA: It is asked whether the Mártély or the Körtvélyes dead-arm is the more polluted.
GY. BODROGKÖZY: It is asked whether the effects of poisoning materials could be demonstrated, whether there is a correlation between the higher-order aquatic plants and the zooplankton, and whether special dead-arm species should be recommended as protected.
M. ANDÓ: It is considered interesting to explain the distribution of the zooplankton by air-motion. It would be worth determining the pollution at the time the water of the rice-fields is run off.
The lecturer's reply: The water of the Mártély dead-arm is shifted towards alpha-mesosaprobe. The effects of poisonous substances were not examined, though it is considered conceivable, particularly in the case of the Rotatoria. An undoubted connection was found between the higher-order plants and the zooplankton. At present not a single species can be recommended for protection.

8. S. TÓTH:

Dipterological researches in the region of the series of locks, Tisza II

Contributions to the discussion:

M. MARIÁN: Proposes the clarification of possible Culicida research now under way in this area.
L. GALLÉ: Asks whether there is a danger of malaria today along the Tisza.
The lecturer's reply: The discovery of Culicida examinations in the region of Kisköre is difficult; apart from those of FERENC MIHÁLYI, only sporadic data appear to be available. The lecturer does not know of malarial diseases, but *Anopheles maculipennis* does live along the Tisza too, and frequently in masses.

9. A. BANKOVICS:

The spreading of the olivaceous warbler along the Tisza

Contributions to the discussion:

P. BERETZK: The olivaceous warbler was first found at Szeged, and since then appears annually. In its spreading it follows the line of the Tisza.
M. MARIÁN: The lecturer's investigations are followed with interest abroad too. It is asked what occupies this species if it can be found in both gardens and flood-area.
GY. CSIZMAZIA: The explosion-like spreading of the olivaceous warbler (1958—61) has stopped. What is the cause of this? The questioner attributes it to the selecting action of the cuckoo.
M. ANDÓ: The extent of spreading of the olivaceous warbler can probably be explained by its climatic sensitivity.
The lecturer's reply: The true habitat of the olivaceous warbler is the flood-area wood, though it does also occur in towns. The cause of the high number of individuals around Szeged may indeed well be climatological. Its climatic sensitivity is undisputed. When driven from the flood-area at the time of flooding, in its need it also makes use of other habitats too.

10. A. LEGÁNY:

The study of bird associations on the Upper Tisza

As a consequence of human activity transforming nature, it is increasingly more urgent to take the natural environment into consideration. An assessment must be made of what dangers threaten the present living world, and how it is possible to ensure the biological conservation and equilibrium of the environment.

With this aim the lecturer has carried out ornithological observations in the area of the Tisza from Tokaj to Záhony, and prepared coenological recordings by the square and band method. The most productive biotope and nesting association were sought for.

In the course of the investigations a separate analysis was made of the individual biotopes (sand-pit wood, willow-poplar grove-wood, willow wood, acacias, mixed wood, poplars, orchards, pastures, ploughland, oxbow lakes, flood-defence embankments and the flowing Tisza). It was found that the most productive habitats as regards the nesting species are the woods. Of these, special mention must be made of the sand-pit woods (5185 g/ha) and the mixed woods (6505 g/ha). The numbers of species and nesting pairs also attained the maximum here. The poorness in species and low production of the poplars planted in place of the indigenous flood-area woods were marked; this should be stopped by means of mixed colonization and with artificial nesting sites. The wood biotopes at the leafy crown and trunk levels are the most favourable for the breeding species, and mainly for the insectivores.

The pastures and orchards primarily come into consideration as feeding areas. The numbers of species and individuals nesting were low, but the mass of those arriving merely to feed was more significant.

In the case of the ploughland and the flood-defence embankments (with the exception of the piles of wattle mats on the embankments), nesting species were not observed. These biotopes were important as sources of food. The mainly unusable ploughland areas might be made more mobile with half-wild pheasant breeding.

The low number of oxbow lakes with the insignificant quantity of ornifauna do not play an important role in the movement of material in the flood-area. They form an ecological unit fairly independent of the neighbouring biotopes.

The ornithological role of the river Tisza too is seen to be that of a resting area rather. This is so particularly at the time of migration. The consumption of food by the low number of species occurring (almost individualized) was not appreciable

Contributions to the discussion:

M. MARIÁN: The lecturer has carried out modern research on a little-studied and interesting area, and has also made useful proposals for the protection of the avifauna. It is asked to what extent the equilibrium of the avifauna is affected by the telephone poles there. In his view the hydro-meso-xerophil avifauna determination is questionable.

P. BERETZK: Because of the disappearance of certain species it would be interesting to take into account the effects of pesticides too.

K. BÁBA: It is asked whether chemical insecticides are used in the Upper Tisza area.

L. GALLÉ: It is asked what the enemies of the birds are on the cut pastures.

The lecturer's reply: The biological protection of the embankments is closely correlated with the telephone poles and wires. Chemical herbicides have not been observed on the flood-plain, but they have in the apple orchards; thus, a change is to be expected in the fauna. On the mown meadows where the avifauna is richer, the birds find food more easily, though their enemies, the fox and man, can also approach them more easily.

11. Gy. Csizmazia:

The mammalian fauna of the Region-Conservation District at Mártély—Körtvélyes

Contributions to the discussion:

M. Andó: The Upper and Lower Tisza districts are similar microclimatologically. It is proposed that steps be taken against the elimination of the big game in the area of Körtvélyes.
Gy. Bodrogközy: The lecturer is asked to collect the nature-conservance proposals and to submit them to the County Nature-Conservance Committee.
P. Beretzk: It is proposed that the otter should be declared a protected animal.
A. Bankovics: The recolonizing of the deer is not recommended before the regional reconstruction.
The lecturer's reply: In his view the differences in the Lower and Middle Tisza are caused by the microclimate.

Dr. Imre Horváth thanked the lectures and contributors, and made special mention of the fundamentally important lectures of Dr. Mihály Andó and Dr. Miklós Marián.

Announcements:

1. New members of the Working Group: Dr. Sándor Újhelyi and István Dosztál. For the time being Mária Tóth has left the Group.
2. A base-house is being constructed at Körtvélyes for purposes of accommodation and storage. A meteorological station is also planned at this site.
3. Tiscia will appear in two numbers this year. It is requested that articles be submitted in June—July.