EDITORIAL

Ladies and gentlemen,
Dear colleagues and students

It was really distressing information for me that Dr. Z. Šesták had passed away and will no more care for *Photosynthetica*.

I have known this journal and Dr. Z. Šesták since my university studies in the sixties. Dr. Šesták initiated and established *Photosynthetica* and settled its scientific profile. As the Editor-in-Chief, he had worked hard, carefully and devotedly for more than 40 years. He required detailed presentation of results, consistent style of figures and tables, exact references and uniformity of measured quantities and their units. The System International (SI) of units has been strictly adhered to.

At the time of the journal´s establishment also the main fields of interest were set. Although the journal was open to all fields of photosynthesis research, soon the papers on physiology and ecology of photosynthesis including analyses of primary photosynthetic plant production prevailed. Publishing complete bibliographies of photosynthetic papers, reviews and methodological papers were found very useful at that time. The journal soon gained global audience and contributors from most continents.

I was honored by the offer to become the Editor-in-Chief of this journal. This will be rather difficult task for me because I can hardly provide the exactness, rigorous approach and long scientific experience of Dr. Šesták.

I have been working for more than 30 years as a university teacher in the Czech Republic (Charles University in Prague, Palacky University in Olomouc and shortly in Masaryk Univeresity in Brno), teaching mainly biophysical methods and biophysics of photosynthesis. I still have in my library one of the first Czech university textbooks about photosynthesis written by Dr. Z. Šesták in the sixties which helped me during my first teaching steps. My scientific interests are basic properties of chlorophyll fluorescence (reabsorption, induction, temperature dependence) in relation to leaf optics and plant stress. I started with *in vitro* model systems (e.g. phosphorescence of chlorophylls) and soon I focused my research on living photosynthetic systems. For more information about me and our laboratory, please consult http://exfyz.upol.cz/bf/en.

In this new situation I would like to stress that the main rules for publishing in *Photosynthetica* established by Dr. Z. Šesták will be obeyed and followed in the future. For instance, detailed presentation of Materials and methods will be required. See the new Notice to Contributors for details on these requirements.

I would like to encourage the authors still hesitating to publish in *Photosynthetica* to send their manuscripts and present their work here. During the last 40 years the research of photosynthesis has moved from the physiological leaf level more to the level of chloroplasts, membranes, membranes fraction and protein complexes. Not only the basic molecular, cellular and organ photosynthetic mechanisms were studied but a lot of interest and efforts are now devoted to studies of **stress behavior, alternative functional pathways, acclimation and regulation of photosynthetic apparatus.**

In the following text, I would like to highlight some of my ideas on broadening the subject areas for presentation in *Photosynthetica.*

In the last decades, rapid boom of gasometric and chlorophyll fluorescence methods occurred. Hundreds of laboratories are now equipped with instruments and are applying these methods to whole leaves either attached or detached from the plant. However, these methods have also some **weak points** or special features which should be evaluated and considered with care. Methodological manuscripts in this respect will be welcome.

I would like to enlarge the number of papers dealing with the basic analysis of **biophysical signals and methods** used in photosynthesis. Among these, probably the most frequent are the **luminescence methods** (including chlorophyll fluorescence). However, in most cases, the optical signals alone are **not specific enough** to be sufficient for full interpretation. As a result, some speculative or uncertain interpretations often appear. Additional experimental methods and model experiments including mathematical modeling should be useful and recommended. *Photosynthetica* will provide space for more rigorous analysis of optical signals, including chlorophyll fluorescence.

Photosynthesis is necessarily connected with the shape, structure and optical properties of leaves, needles, stems or suspensions of cells, organelles or membranes. The geometrical character of the light beam, either incident or within the leaf, the spectrum, polarization, intensity gradients and time courses affect the photosynthetic function. *Photosynthetica* will offer a platform for presenting papers regarding **optical properties of leaves,** plants, algal suspensions or canopies.

Among other important physical and mechanical phenomena belong **movements** of leaves, stomata, and chloroplasts in reaction to **local or whole plant stress**. There is a systemic physical (electrical or hydraulic) and chemical (plant hormones, small signal molecules) reaction of plant and photosynthesis to local effects. **The systemic reactions** of a plant on the level of photosynthetic apparatus in relation to signals remain an interesting and unresolved question that will be given space in *Photosynthetica*.

Similarly, the **mutual relations** of photosynthetic CO_2 assimilation, transpiration, stomata opening, intercellular CO_2 concentration, respiration, photorespiration and leaf structure form also a very complex phenomena deserving further research.

This journal has accumulated a large amount of data on individual **plant stress responses**. Very often the photosynthetic apparatus was used as a **stress indicator**. However, the **relations between changes of photosynthesis and other plant physiological functions** are still not fully understood. From this point of view, we encourage qualified **reviews** that will try to accumulate, describe and generalize the responses to individual stresses. A mere accumulation of data should be now followed by a real and deep synthesis. That should increase the value of previous results and increase citation by other researchers.

The journal will not be limited only to photosynthesis of higher plants. It will be open in the same way to studies on algae and photosynthetic bacteria, including specific methods used in this area of photosynthesis research.

Dr. Šesták and referees of *Photosynthetica* very strictly demanded the correct **statistical approach.** I would like to continue in this trend. I think that in experiments where the statistical treatment is necessary and possible, it should be performed with full responsibility and understanding. It is not enough just to use the mathematical formulas without deeper understanding. As an example, statistical treatment in case of only three replicates including the t-test usually has not enough statistical power and is not substantiated. These cases should be judged more carefully and some of them might be designated as irrelevant and not suitable for publishing. So I encourage the authors to plan experiments with more replicates or, if necessary, to substantiate a low number of replicates.

Sometimes one performs just pilot experiments measuring one or two photosynthetic parameters. Usually such measurements indicate a certain trend, mechanism or phenomenon but the number of independent methods is not large enough to support the hypothesis reliably. So the use of a **greater number of independent methods** for solving a problem will be encouraged. Use of only a single method might be regarded as insufficient for an acceptable manuscript.

In general terms, papers that are published in *Photosynthetica* may be divided into descriptive ones and mechanistic ones. The former only accumulate data without deeper understanding or revealing the underlying dependences. The latter include hypotheses on the mechanisms of the studied process. *Photosynthetica* will support publication of **papers having the idea and hypotheses** rather than only presenting data. Another frequent problem is the excessive extent of Discussion. Reasonable compromise between length and depth of discussion has to be found to prevent futile words or mere speculations. However, stimulating well based hypotheses ready for testing are useful for further research and may be incorporated.

In my opinion and experience, the References often represent only a very selected choice of relevant papers (authors´ opinion) neglecting a number of important papers in the same field. Sometimes papers of

only two or three laboratories are cited supporting just one view of the problem. Attention needs to be paid to **more comprehensive spectrum of references** and deeper survey of the analysed problem not ignoring the earlier original papers. This should prevent repetition of results or ideas or even support of misleading ideas. I ask the authors and reviewers to pay attention to this aspect of the manuscripts.

In summary, in the preceding text I tried to present my ideas about the field of interest and content of papers to be published in *Photosynthetica.* I would like very much to encourage authors to present manuscripts dealing not only with ecophysiology of photosynthesis but also with biophysics, biochemistry and molecular biology of photosynthesis, papers with mathematical and physical models of optical, fluorescence, thermal and other physical phenomena accompanying photosynthesis, papers describing complex documentation and hypotheses of relation between plant stress and photosynthesis. New results of photosynthetic processes on all levels of structure, starting with canopy and leaves and ending on the level of individual molecules will be always welcome in this journal.

I would like to thank all authors, reviewers, editorial staff and members of the editorial board of *Photosynthetica* for their work and express my wish and hope that they will continue in this demanding and very important work in the future. New ideas, criticism or suggestions for improvement of our work are welcome.

I wish success in revealing reliable new results to researchers and I hope that the journal *Photosynthetica* will continue to publish papers containing interesting and stimulating information on the fascinating phenomenon of life – photosynthesis.

Jan NAUŠ

In Olomouc, February 2009

Zdeněk Šesták

4 August 1932 – 14 November 2008

On 14th November 2008, the journal Photosynthetica suffered a hard blow. Its Editor-in-Chief Dr. Zdeněk Šesták, DrSc., passed away immediately after a difficult heart operation. Born in Prague on 4th August 1932, he studied plant physiology and anatomy at Charles University of Prague in 1951-56. He elaborated a methodologically important M.Sc. thesis on the determination of organic carbon and chlorophyll contents in natural waters, under the supervision of Prof. S. Prát and Dr. Ivan Šetlík. It was the latter supervisor that triggered off Zdeněk's interest in the photosynthetic pigments. Already at that time, Zdeněk became a gifted and meticulous experimenter. From those times, we keep good memories of Zdeněk's active involvement in a group of students who attended semi-legal seminars on various aspects of plant physiology, organized beyond the rather toughly prescribed official curriculum.

For two years, 1957-58, after his graduation, Zdeněk worked at the documentation service for agricultural research. From there originated his lifelong keen and deep interest in all kinds of problems associated with scientific communication, also including editorial work. Soon he did learn to understand the value of transmitting the results of one's research clearly and concisely to the scientific community.

Since 1958 Zdeněk had been actively involved in scientific research at the present Institute of Experimental Botany of the Czech Academy of Sciences in Prague. Here, above all, he further developed his interest in photosynthesis. In 1961, he submitted his Ph.D. thesis on "Chlorophyll Amount and Photosynthetic Rate" based on research directed by his own ideas under the formal supervision by Prof. R. Řetovský. Later, as a member of the Institute's laboratory for studies of plant water relations and photosynthesis, headed by Dr. B. Slavík, he developed the hypothesis of the chlorophyll compensation concentration.

Gradually, the scope of Zdeněk's scientific interests was widening towards the relationship between the age of a leaf and its photosynthetic performance. This topic was first summarized in his DrSc. dissertation entitled "Chlorophyll and Photosynthetic Activity during Leaf Ontogenesis". His involvement in the study of this problem then culminated in his editorship of a comprehensive book

written by him and several of his colleagues, on "Photosynthesis during Leaf Development", published by Academia, Prague, and Dr. W. Junk, Publ., Dordrecht – Boston – Lancaster, 1985.

Along with his photosynthesis research, Zdeněk permanently cultivated his other favourite field, namely the scientific communication. The combination of these two loves stimulated his idea to establish a scientific journal devoted to all types of photosynthesis research. After an appreciable amount of lobbying within the Academy of Sciences, the journal named Photosynthetica eventually came into being in 1967. It was then the world's first journal of its kind. In a certain perspective still more important than that was the fact, that Photosynthetica was declared as an international journal in which articles could be published in English, French or German. Photosynthetica thus allowed the scientists from countries behind the iron curtain, hindered in publishing in the western journals by strict political bans, to get their papers accessible even on the other side. Readers not familiar with the atmosphere in the East European countries during the cold war cannot imagine how important this was for us and how much persistence, patience and courage it required from Zdeněk to keep this possibility open.

Zdeněk Šesták justly became the journal's first executive editor, while the Editor-in-Chief was Prof. Ivan Málek who immediately and sincerely supported this idea. At that time Málek occupied a high position in the Czechoslovak Academy of Sciences and apart from putting through the edition of a new international journal, he arranged all necessary infrastructure. From the early days of Photosynthetica, it was Zdeněk's determination and editorial skills that kept this journal going even in the politically unfavourable years following the defeat of the 1968 "Prague Spring". B. Slavík succeeded I. Málek as the Editor-in-Chief of Photosynthetica in 1971. After Slavík´s retirement in 1991, Zdeněk took over his position in which he served the journal until the end of his life, with a lot of self-sacrifice, especially in his last years. As the members of this journal's Editorial Board, we highly value Zdeněk's impartial and down-to-the-point treatment of the manuscripts submitted for publication. As the contributors to two books edited by him, especially the classical "Plant Photosynthetic Production. Manual of Methods" (Dr. W. Junk, Publ., The Hague, 1971,) we can well appreciate Zdeněk's qualities as a demanding editor. Our burdensome slowness in writing the reviews of the papers submitted to his journal, or of the book chapters, caused him a lot of worries. But his sometimes rather serious reproaches never passed beyond the border of deep friendship to us. His gentle style of reminding us of our obligations resembled that of a father speaking to children who evidently are not aware of the troubles they are causing. A more detailed description of the uneasy beginnings of Photosynthetica in relation to the later more widely dispersed journal Photosyntesis Research edited by Govindjee, can be found in the article: Govindjee, Šesták, Z. and Peters, W. R.: The early history of Photosynthetica, Photosynthesis Research, and their publishers [Photosynthetica 40(1): 1-11, 2002].

From the very beginning, Zdeněk Šesták together with his late colleague and friend Jiří Čatský put Photosynthetica in the service of tracing and documenting the progress of photosynthesis research in the world. The journal's section "Bibliography of Reviews and Methods of Photosynthesis" has had 90 parts by now. Besides, in 1974-98, Z. Šesták and J. Čatský edited a 25-volume series of books named "Photosynthesis Bibliography", published by Dr. W. Junk and Kluwer, respectively.

For the most part, this obituary has tried to accentuate Zdeněk's achievements that were connected with his main research themes and his activities and merits associated either directly or indirectly with Photosynthetica.

There is no room here for a detailed presentation and evaluation of all achievements of such an active, hard-working and open-minded personality as Zdeněk Šesták. He was also deeply interested in arts and history, particularly in that of his home district of Prague named Žižkov, a very

characteristic and picturesque suburb of Prague in the years before and between the two wars of the last century. About it he published three popular books. Other books written by him that should be at least mentioned here are his manuals of scientific writing. Last but not least, it would perhaps be unfair not to mention his interest in marionette theatre, which he also actively practiced in a marionettes club, showing his deep understanding for childern´s minds.

For a detailed account of the life of Zdeněk Šesták and of all his important achievements until 2002, we refer the readers to the article by J. Čatský, honouring Zdeněk's 70th birthday [Biologia Plantarum 45(4), 2002].

We are sure that Zdeněk Šesták is missed and will be remembered by everyone that has ever been associated with Photosynthetica in any way. He will occupy a prominent place in the memories of his colleagues, friends, students and all those who have experienced his bright intellect and kind heart. He left behind two mourning daughters, one son and four grandchildren. They all have our sympathies and we mourn with them.

Jan KVĚT and Ivan ŠETLÍK
Třeboň