

Papers on diatoms dedicated to
KURT KRAMMER
on the 85th anniversary of his birthday

edited by

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Phot. Ditmar Metzeltin

FOREWORD

Dr. Kurt Krammer, friend and colleague to many diatomologists worldwide, distinguished scientist and, with Professor Horst Lange-Bertalot, co-author of a fundamental work on identification of freshwater diatoms, celebrates his 85th birthday this year. Here we present papers contributed to honor him on this occasion.

Dr. Krammer's devotion to diatoms has borne fruit in a great number of basic monographs on diatoms. The most famous publication, issued in five volumes within the series *Süßwasserflora von Mitteleuropa*, has had a huge impact on this field of research through the last few decades. Kurt Krammer was its senior author. Though it was intended as a guide for diatom identification in Central European inland and coastal marine waters, it was quickly adopted and became part of the canon of world literature on diatoms. And how much poorer the field of diatom research would be if not for his monographic series on diatom genera such as *Pinnularia* and on selected groups of taxa including cymbelloid diatoms. His output includes many more papers and books, but these mentioned publications are probably the high points. They will remain a model of diatom research and writing, grounded in Dr. Krammer's deep knowledge of classical taxonomy and giving essential information on the morphological variability, distribution and autecology of the studied diatoms. His focus has been on European diatoms but his contribution goes much further: he has described hundreds of diatom taxa, and what makes this part of his work so very useful is that the taxa he has analyzed are important bioindicators. In addition, his skill and enthusiasm in helping solve taxonomical problems are well known to beginners and others working in the field of diatomology. In this way he has contributed to

research on diatom species in a way that goes far beyond the subject matter of his publications.

For Dr. Kurt Krammer, biology is an obsession that began in his school days. Through the turmoil of the first years of World War Two he managed to complete his academic education in biology, as did Gisela, his university colleague and later wife. Kurt Krammer earned his Ph.D. in biology, but then had to take over the family business from his father, so he never became a university employee. His scientific activity went on under the umbrella of the Institute for Surface Analysis, a nonprofit organization.

Some of us have met Dr. Kurt Krammer a number of times during German-speaking diatomologists' meetings. Our impressions of him are these: always smiling, friendly, somewhat ironic, and surprisingly somewhat shy, but obviously happy in his private life and his research. Our colleague Ditmar Metzeltin has captured these qualities in his photo on the first page of this issue.

Kurt Krammer's life shows us that an academic career is not the only way for a scientist to succeed. A very well organized man with his own impressive arsenal of microscopy equipment (including SEM), and not burdened with institutional ballast, he enjoys the freedom of free-lance research. We admire his output even more when we remember that he started his scientific work quite late.

These papers published for our fellow diatomologists are a tribute to Dr. Kurt Krammer, his life and research. The project arose spontaneously among a group of his colleagues and friends. In this editorial effort we appreciate very much the help and cooperation of Professor Horst Lange-Bertalot and Dr. Ditmar Metzeltin, Kurt Krammer's true fellow warriors

in science. All the accepted papers passed through peer review, and we would like to express our gratitude to the referees. The contributions accepted for this number include many aspects of diatom research covered by Dr. Krammer. Opening the volume is a paper which relates morphological study of diatoms to nanotechnology applications. It is a fitting start,

as in his own work Dr. Kurt Krammer has never hesitated to embrace new technologies.

Many happy returns! Ad multos annos! Hoch soll er leben! Sto lat!

Andrzej WITKOWSKI,
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ON THE OCCASION OF DR. KURT KRAMMER'S 85TH BIRTHDAY

HORST LANGE-BERTALOT & DITMAR METZELTIN

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We would like to say only a few words before our ‘fellow warrior in science’ and friend tells something about his life. What would our world be without diatoms? Surely it would not be what it is like today. What is the modern human on this Earth? Since every fourth or fifth oxygen molecule we inhale is produced by diatoms, and since carbon dioxide is organically bound at the same time, there might be a problem. Kurt Krammer had the right instinct when he dealt with diatoms in good time. But he only did so incidentally, so to speak, because his dissertation in the field of zoological physiology and biochemistry dealt with an entirely different problem.

For Horst Lange-Bertalot, latterly his co-author, things developed quite similarly. He carried out research on the physiology of plants and as a professor taught general botany. Only lately, in the 1970s and by accident, he took note of the particular ecological properties of diatoms. We, the rather few diatomologists in Central Europe, somewhat envied Kurt Krammer for his highly efficient private SEM and his outstanding photography. Spontaneously the plan for close cooperation on a project was created, for which the community of applied hydrobiology was waiting particularly impatiently. Kurt Krammer was an expert on the principles of construction of different diatoms, on skeletons in general, and had a special interest in the genera of pristine waters. Horst Lange-Bertalot, however, was a specialist in autecology, and in particular, algae assemblages of highly eutrophic and more or less pol-

luted waters and the influence of those waters on their distribution. In quite a short time his cooperation produced five volumes on freshwater flora (*Süßwasserflora*), three critical supplementary volumes in the *Bibliotheca Diatomologica*, and numerous other joint publications in various scientific journals. The five volumes of *Diatoms of Europe* published since 2000 shall be followed by at least the same number of volumes again, in order to finish off the latest taxonomic findings adequately. There are still many species and genera for which until now no revision or critical appraisal of the existing selective revisions have been made. For these purposes, in the meantime *Süßwasserflora* is at least a helpful basis for further taxonomic research. It plays a leading role especially in the ever more important international ‘Water Quality Monitoring’, which cannot await more modern classification floras. From this point of view a competent voice from the circles of ecological research and academic teaching was very significant for us: ‘For students, *Süßwasserflora* serves as a general basis and as motivation, and it is indispensable; conditions have changed fundamentally; we distinguish the research period without *Süßwasserflora* from the period with it (from 1986 to 1991).’

But here Kurt Krammer shall speak for himself:

I was born on April 4th, 1925, in Franzensbad (Františkovy Lázně) next to Eger (Cheb), in the formerly Bohemian Egerland. Together with Marienbad (Mariánské Lázně) and Karlsbad (Karlovy Vary), Franzensbad formed the so-called ‘Triangle of Spas’, which, before the First World

War, was frequented not only by the upper class of the former Austro-Hungarian monarchy. From Eastern Europe as well, especially from Russia, lots of people came here looking for treatment, and made the Egerland a flourishing region. After 1919, when Czechoslovakia split away from the former Austro-Hungarian monarchy, these spas were cut from their hinterlands and had to face growing unemployment. My father, a young engineer, did not find any adequate work, so we moved to Tetschen-Bodenbach (Děčín) on the River Elbe in Northern Bohemia. My father was a nature lover, and he built, on high ground in the middle of the woods, a nice house in Bauhaus style.

As children we grew up in the middle of the woods, and our comrades were plants and animals. It was natural that we learned the names of the most important living things. When my mother was cooking she would, for example, send me out for three brown birch boletes, two penny buns (ceps), five goat lips and a small pot of mountain cranberries, and, apart from that, a mixture of different herbs for the salad. My passion for nature became even deeper with the help of a young lecturer in botany who was a friend of my parents and who worked at the Karl-University in Prague and at the Agriculture College in Tetschen. She early recommended that I read the *Strasburger Lehrbuch der Botanik* and not biological light reading. But there were still more ‘biological influences’ around me. One of my uncles was a biology teacher at a grammar school, and his hobby horses were beetles and butterflies. The whole school building was full of showcases with everything from egg to imago. His specialty was caterpillars. Everywhere in the school building stood cases with caterpillars, where butterflies were bred from eggs. Every morning the pupils had to feed the caterpillars with stinging nettle, beech sprigs, spurge and so on.

But my father mainly supported my enjoyment of biology. As a boy he went to grammar school in Eger and his biology teacher was Vinzenz Brehm (see *Cymbella brehmii* Hustedt 1912). He worked in the Austrian Hydrobiological Institute in Lunz am See, the Austrian

counterpart of Plön in Holstein. Brehm probably spent the whole time talking about algae, little crayfish, rotifers and the like, because on my father’s bookshelf I later found lots of exercise books with drawings of these living things. I was fascinated particularly by one exercise book written by Hustedt, *Germany’s Diatoms*, an edition from 1923. For Christmas I received a Kosmos microscope which enlarged by 630×, and from my pocket money I bought a plankton net and all things needed for making specimens. Then I started walking around in the Elbsandstein Mountains (Elbsandsteingebirge) and in the Bohemian low mountain range opposite, and explored the stretches of water there. Doing so as a young boy I already noticed that these two geologically very different areas had completely different diatom floras. It was not long after that the war began, and our biology teacher said we should not be too complacent about being 14 years of age. If this war lasts as long as the first one, it will also be our turn.

And that was what happened. I was not yet 18 years old when I had to go to war. Winter 1944 was very hard, and after suffering some smaller wounds my toes got frostbitten. But I was lucky and arrived at a military hospital in Western Germany. I was surprised because in the bed next to mine lay a young American. Almost the whole military hospital was full of Americans and Englishmen who had been made prisoners in the Battle of Arnhem. They were the first ‘Western’ people I got to know in my life, and again there was a young biologist among them, who told me a lot of things about his country. April 4th, 1945, was then the happiest day in my life, because the British Army finally occupied our military hospital. For our having behaved well the British returned the favour and suddenly we got good bread, butter and black tea. All these were real delights. In autumn, when I was set free, I had no connection with my parents anymore, who in the meantime had to leave the Sudetenland. So I became a farmhand, and during the cold autumn days I had to pull turnips in the fields and clean the clay from them, which was quite a heavy job to do, having lain in bed for months

before. Then I tried to become a bricklayer, participating in the reconstruction of a hospital in Osnabrück; mainly we had to work with the old bricks found in the war ruins. Finally I found my parents, who had gone to Halle/Saale in Eastern Germany at that time.

Of course I immediately started thinking about studying biology, but it was not easy to get authorization for this. Finally a friend of mine helped me. He had connections to the Soviet administration and took me with him to the military governor of the city, who was a jovial man. He looked at me and said 'You will study medicine!' and conveyed his order (*ukaz*) directly to the university. Thus I was registered there and did not study medicine, of course, but biology. In Halle at that time, zoology was not so well filled, but botany was, for example with Meusel the phytosociologist, or Buder, another phytosociologist who had come from Breslau (Wrocław). I was particularly impressed by Meusel's lectures about plant systematics. His two-hour lectures started at six o'clock in the morning, but he drew lots of diagrams on the blackboard, which one had to remember. The early morning and the constant repetition of diagrams often put the students into a drowse. For the group, consisting of a little more than twenty students, attendance was compulsory. The lectures about plant physiology were much more exciting. Apart from that I was rather more interested in developmental physiological processes, especially the studies by Josef Spek, a zoologist from Heidelberg, who had worked at the Oceanographic Institution in Woods Hole (U.S.A.) for several years. Spek was offered a professorship at the University of Rostock and I followed him there. There, Gisela Schröer, my later wife, and I worked together on our dissertations, in which I had to carry out examinations of the bipolar differentiation of the egg of the Teleostei (Actinopterygii). After my dissertation I initially wanted to qualify as a university lecturer in Rostock, but the political circumstances in the GDR noticeably deteriorated.

So we moved to Düsseldorf, where my father was already making progress reestablishing his former technical publishing house. I intended to

find employment at a West German university but suddenly had to take over my father's publishing house because of his serious illness. One of my uncles, a biologist as well, encouraged me by saying a biologist could manage everything if obliged to. The first years were quite difficult because I had to deal with balance sheets, credits and taxes, which were fields of work a biologist usually does not know. In the 1960s the enterprise took a turn for the better and that success satisfied me in a certain way. Not until the end of the 1970s could I start thinking about biology again. Having examined the functions of transmission of songbirds' signals, I returned to my 'childhood sweetheart', the diatoms. I set up a private laboratory with several Zeiss microscopes and one electron microscope, which was as a nonprofit institution as the Institute for Surface Analysis (registered association). Several students from the Technical College in Aachen used the available equipment to work on their theses and dissertations. Surface structures of materials have much in common with the structures of diatoms. My son Klaus has also worked there on his dissertation. As earlier, again I observed in studies that many diatoms cannot be assigned to any category because their characteristics are based on the insufficient scientific findings of the 19th century. Professor Gerloff from Berlin therefore asked Professor Lange-Bertalot and me to fundamentally revise Hustedt (1930), which was a kind of handbook commonly used for classification. The result of our revision was a work of five volumes, of which several reprints have been published and a large number of partial translations in facsimile, for example in Japanese. But in our opus as well, for many groups of diatoms only a temporary revision could be made, so we decided to revise the freshwater diatoms completely and to publish a new revised edition.

Due to my advanced years only some volumes could be completed, in which the genera *Cymbella senu lato* and *Pinnularia* especially concerned me. Preparation work for revision of the genera *Neidium* and *Caloneis* could not yet be done, and its continuation should be entrusted to younger colleagues. Let me close by thanking all

those who have helped me throughout the three decades of my work on diatoms. I wish a successful future to those who are devoting their efforts to diatom research.

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LIST OF NEW NEMES AND COMBINATIONS BY
KURT KRAMMER

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Cymbella alpestris Krammer, Diatoms of Europe 3: 163, Pl. 33, figs 1–13. 2002.

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Cymbella cistuliformis Krammer, Diatoms of Europe 3: 170, Pl. 101, figs 1–4, Pl. 102, figs 1–5. 2002.

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