

Professor Hynek Burda septuagenarian

Jaroslav ČERVENÝ

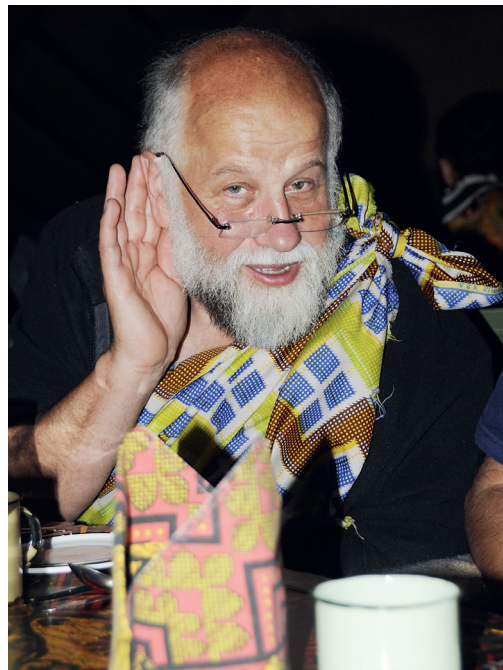
Department of Game Management and Wildlife Biology, Czech University of Life Sciences,
Kamýčká 1176, CZ–165 21 Praha 6, Czech Republic; cerveny@fld.czu.cz

received on 4 November 2022

Time passes inexorably and many of us still have fresh memories of the round sixtieth or even fiftieth birthday of the outstanding Czech zoologist Professor Hynek BURDA, who is also well known in zoologist circles outside the Czech Republic. I have known Hynek for much longer than I did not know him and being his contemporary, it should not surprise me, but for many of his students it may be hard to believe that he is celebrating his 70th birthday this year.

Hynek was born on 27 November 1952 in Chlumec nad Cidlinou. He spent his pre-school years in the East Bohemian countryside, where he was influenced by nature and farming. His father, an agricultural engineer and teacher, got a job in Prague and the family moved to the city still before Hynek started primary school. Nevertheless, he spent most of school holidays with his grandparents in the East Bohemian village of Dobřenice and thus stayed in touch with nature.

He attended high school in Prague specialized in humanities and was not sure whether to start studying archaeology (he was particularly interested in Egyptology) or zoology. However, in 1971, the year of his graduation, the study of Egyptology was not open, and so it was decided. In fact, interest in zoology prevailed, and from 1970 to 1973 Hynek worked at least two months every year as an animal keeper in the zoological garden in Dvůr Králové specialized in keeping and breeding large African ungulates. Hynek's dream was to study large African mammals in the field, and he began learning Swahili as early as 1969. He mastered the language, passed the state examination and together with a well-known Czech Africanist, Luboš KROPÁČEK, he compiled a Czech-Swahili dictionary and grammar and published it in 1980.



doi: 10.37520/lynx.2022.001

In 1971 he began studying zoology at the Faculty of Science of Charles University in Prague. Here he studied together with Martin BRANIŠ, Ivan HORÁČEK and Jan ZIMA among others, under the auspices of prominent Czech zoologists such as Professors Vladimír HANÁK (taxonomist and field ecologist), Vratislav MAZÁK (evolutionary biologist), Leo SIGMUND (morphologist) and Zdeněk VESELOVSKÝ (ethologist, then a director of the Prague Zoo). They all (and the intellectual environment of the Charles University *per se*) had a great influence on Hynek and shaped his later academic career, in which he always combined the given research fields, approaches, knowledge, and views.

In fact, there was another focus in Hynek BURDA's career that should not be forgotten, namely biomedical sciences. As part of his Master thesis (on the comparative morphology of the ear in "insectivores" – today we would say in Eulipotyphla) and his PhD thesis (on the ear in laboratory and wild rats, genus *Rattus*), he did research in the Laboratory of Hearing Research at the Institute of Experimental Medicine, which was then housed in the premises of the University Teaching Hospital, Department of Otolaryngology. His mentor, Luboš VOLDŘICH, and daily contact and friendship with surgeons and physicians certainly had strong influence on Hynek's thinking.

Hynek's first period of research was dominated by comparative and functional anatomy of the ear (particularly the cochlea). He mastered a delicate method of preparing surface specimens of the organ of Corti and published a number of papers that are still cited today. In 1981, he convened a symposium on ear and hearing research at the World Mammalogical (then Theriological) Congress in Helsinki. Here he met and became friends with Neels COETZEE, Gil DRYDEN, Waldo MEESTER, Walter PODUSCHKA, among others, all of whom in some way influenced the course of his further life and academic career. Particularly fateful (in a positive sense!), however, was the friendship and established collaboration with Volkmar BRUNS, hearing researcher, from the J. W. Goethe University in Frankfurt am Main (Germany).

But Africa's calling has not been silenced. And so Hynek applied for a position as a senior lecturer in vertebrate zoology at the University of Zambia in Lusaka, which he got. Here he met William BANAGE and Geoffrey HOWARD, among others. The years 1984–1986 in Zambia again influenced (imprinted) him and his family (wife Jana and sons Tomáš and Jan who accompanied him) in a most positive way, like probably no other two years in their lives. Here, the second research phase of his academic career was initiated: the study of the biology and evolution of subterranean mammals, especially African mole-rats (Bathyergidae). The friendship and fruitful collaboration with his Zambian assistant and later PhD student Mathias KAWALIKA was instrumental in advancing this research.

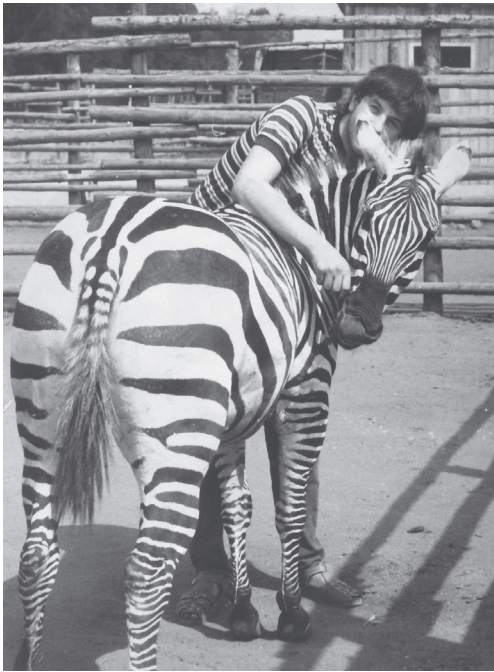
When the end of his contract in Zambia loomed and the political leadership and director of the Institute of Experimental Medicine changed, Hynek was not allowed to prolongate his stay in Zambia and was asked to return home. At that time, however, he was invited by Volkmar BRUNS for a short research stay at the Zoological Institute in Frankfurt and encouraged by BRUNS (and Hynek's former "Doktorvater" Leo SIGMUND) to apply for a prestigious German Alexander von Humboldt Fellowship. Hynek followed their advice and was successful. However, his former employer in Czechoslovakia refused to accept the scholarship and ordered the family to return home. The answer was that in 1986, three years before the Velvet Revolution of 1989, which no one dared to dream of at that time, the family decided not to return home but to stay in Germany.

For his Humboldt studies, Hynek brought several live Zambian mole-rats (now denoted as *Fukomys anelli*, a new species and new genus also described by him and colleagues) to Europe. At the same time as and independently of his South African colleagues, Hynek was the first to succeed in breeding of hairy African mole-rats in captivity and to describe their unique reprodu-

ctive biology, eusocial mating system, incest avoidance, chromosome diversity, low-frequency hearing and ear specializations, as well as other sensory adaptations, diverse morphological (particularly sensory) and ethological adaptations. In 1993, together with Mathias KAWALIKA, he described for the first time, many unexpected (and at the time hard to believe) aspects of the biology of the giant mole-rats (*Fukomys mechowii*), an enigmatic species whose biology was unknown to scientists, although it is a conspicuous, widely distributed mole-rat species well known to locals in Zambia.

During the stay at the Zoological Institute in Frankfurt in Volkmar BRUNS' lab, Hynek's third research interest, namely magnetoreception, was awakened. Next door to BRUNS' lab, was the department of Wolfgang WILTSCHKO, the man who had demonstrated magnetic compass orientation in the robin in the mid-1960s, for the first time in an animal. And as Hynek later noted, it did not require too much imagination in this constellation to suspect that magnetoreception could also be useful for orientation in labyrinths and keeping the course of digging in mole-rats that live in the darkness of their underground burrows. Although the story of this discovery is exciting and instructive, I must keep it brief here and give it in a dry text: The Ansell's mole-rat was the first mammal for which magnetoreception could be unambiguously demonstrated under controlled laboratory conditions, it has become the mammalian model species for biomagnetic research, and Hynek's "nest building assay" has become an experimental paradigm in the study of spatial orientation in small mammals. I will return to Hynek's biomagnetic research later.

In 1989, Hynek habilitated at the Zoological Institute in Frankfurt. The reviewers of his habilitation thesis dealing with *sensory ecology*, were the renowned zoologists Gerhard NEUWEILER,





Dietrich STARCK and Wolfgang WILTSCHKO. Professor STARCK also recommended Hynek to Jürgen WINCKLER, director of the Institute of Anatomy at the Faculty of Human Medicine at the University in Frankfurt am Main, and Hynek became WINCKLER's assistant and senior lecturer in human anatomy in 1989. He attended all theoretical and practical courses in human anatomy and histology for medical students, but had freedom and full support from WINCKLER in research on mole-rats and their keeping and breeding on the premises of the Anatomical Institute.

In 1994, Hynek was appointed full professor (chair, ordinarius) of the Department General Zoology at the University of Essen (later University of Duisburg-Essen). He worked there until his retirement in 2018. He supervised countless Bachelor and Master students as well as several doctoral students (to name just a few: Sabine BEGALL, Radim ŠUMBERA, Philip DAMMANN, Pascal MALKEMPER, Regina WEGNER, and Yoshiyuki HENNING). He and his lectures were extremely popular, so it is not surprising that he was awarded several times by the students and rector as the best teacher of the faculty or even of the entire university. He and his group members collaborated closely with many mammalogists, and in his lab in Essen he also hosted Rodney HONEYCUTT (Texas A&M University), Eviatar (Eibi) NEVO (University of Haifa), Adel SAHIN (University of Cairo), Pavel NĚMEC (Charles University Prague), and Giora HETH and Josephine TODRANK (University of Haifa). Sabine still keeps and breeds various species of mole-rats in Essen carrying on Hynek's legacy.

Noteworthy and absolutely legendary were the one-week field excursions for German students that Hynek organized and conducted with his academic assistant Marcus SCHMITT and technical assistant, Gerd HAMANN twice a year from 1997 until 2016 to the Šumava National Park (Bohemian Forest) in south-western Bohemia and, since 2010, also to the Podyjí National

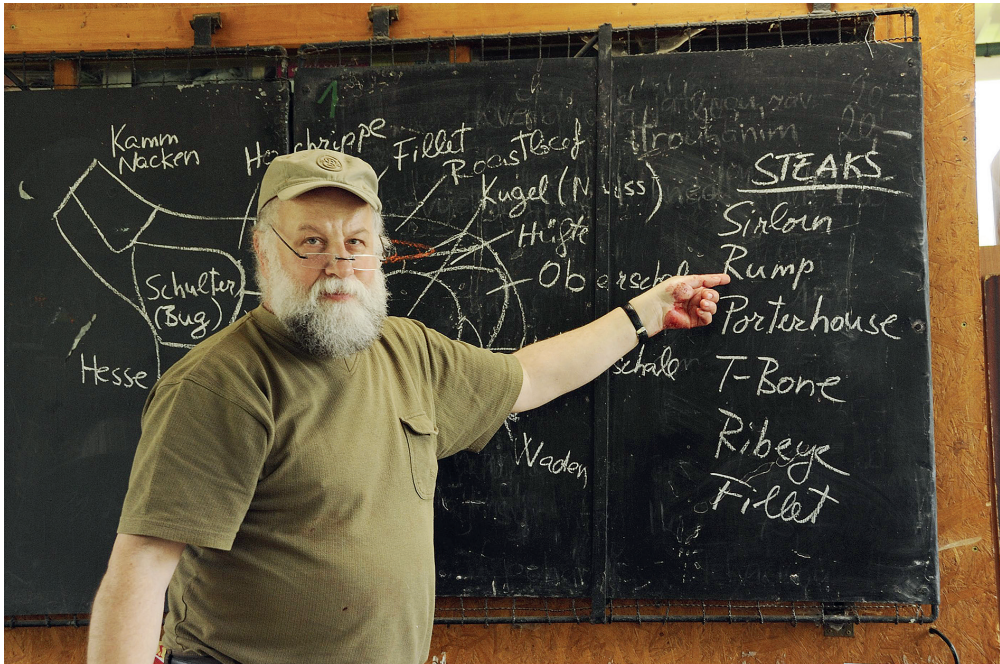
Park (Thayatal) in southern Moravia. I myself accompanied and co-supervised these excursions and received a lot of feedback from German students proving how extraordinary and important they were for them. The dissection courses of game (roe deer, red deer, wild boar) were also unforgettable, where five students at a time were given a killed animal, had to skin it and dissect it according to Hynek's instructions. He is a talented painter and drew anatomical sketches on a blackboard. He himself called this practical course "Anatomy for cooks" and instructed us how to use certain pieces of meat according to the scheme: "This is the *musculus iliopsoas*, but my wife calls it fillet, you also use it to prepare chateaubriand steaks, and you yourself need this muscle to flex the hip and ..." And the next day we had excellent deer goulash prepared by Jana ...

Since 2000 Hynek has been a visiting professor at the University of South Bohemia in České Budějovice, and since 2009 he has also been a visiting professor at the Faculty of Forestry and Wood Sciences at the Czech University of Life Sciences in Prague. He is currently leading a team there that is working on the sensory ecology of domestic and game animals within the framework of an excellent research project.

His former students (and especially Radim ŠUMBERA's team) advance BURDA's pioneering studies in Africa, but Hynek still coordinates and consults many such field studies and helps with advice and arranging contacts. He himself (and, in fact, we collectively) visited Africa several times since his Zambia sojourn, but mostly as a tourist and participant of various scientific meetings. However, there was one important exception – namely, his (and his wife Jana's) participation in Peter OVERTON's expedition to the Nyika Mountains in Malawi in 1997, when he made important discoveries within one month concerning the silvery mole-rats (*Heliophobius argenteocinereus*), Whyte's mole-rats (*Fukomys whytei*), several species of mice and dormice, and most importantly, a new record (after a hundred years) of a rarely collected fruit bat, *Plerotes anchietae* (only nine specimens were previously known). This one-month stay by Hynek on the Nyika Plateau was the catalyst and stimulus for many years of field research to follow there.

According to Web of Science's dry bibliometric statistics, Hynek has published 170 papers that have been cited more than 4,000 times, and his Hirsch-index is 38 (which is certainly an impressive figure for a "classical mammalogist" studying animals and phenomena that most of his colleagues have heard of but are not the subject of their own research).





His (and his colleagues’) research topics are spectacular and attract the attention of the public, the scientific community and the media – to name just a few examples (short running titles are given): “Are naked mole-rats eusocial and if so, why?”, “Magnetic alignment in cattle”, “Individual recognition and incest avoidance”, “Sexual activity and reproduction delay ageing”, “Being attractive brings advantages”, “Directional preference enhance accuracy in hunting foxes”, “Magnetic alignment in Christmas carps”, “How to eat a carrot”, “How to land on water”, “Pull of the North”, “Homing in dogs”, “To mate or not to mate?”, or “Living in a stethoscope”.

I had the opportunity to be a member of the research and co-author team in several projects dealing with magnetic alignment in vertebrates (another research concept founded and advanced by Hynek). And I can attest to the great and exceptional response we received after the publication of our paper in *Proceedings of the National Academy of Sciences of the USA* in 2008 on magnetic alignment in grazing and resting cattle and deer. In particular, using Google Earth to obtain freely accessible global information on the spatial orientation in cattle, Hynek’s original idea, intrigued the scientific and popular community worldwide. We also received personal admiring and encouraging feedback from some Nobel laureates. The paper on dogs preferentially orienting north-south when marking (defecating and peeing) even earned us the IG Nobel Prize in 2014, an award for research that makes people laugh and then think.

Being a gifted presenter and popularizer, Hynek is also a welcome speaker at various scientific meetings, seminars, colloquia etc. In fact, together with his wife Jana (and his students), he has long made attending conferences their main vacation activity. As a result, they have missed only four of the 12 International Mammalogical Congresses to date.

To complete the list of Hynek's activities and accomplishments, he served as a scientific editor for *Scientific Reports* and *Frontiers in Ecology and Evolution* and as a reviewer for numerous scientific journals, funding agencies, universities, and research institutions. He published countless articles popularizing the subject, served as a consultant, and contributed to many television and radio commentaries and documentaries worldwide. He has co-authored and co-edited numerous (and highly rated) university textbooks on general zoology, systematic zoology, evolution, human biology, monographs on subterranean mammals, mole-rats, etc. He has educated and influenced countless students (bachelor, master, PhD, and postdoctoral) in Zambia, Germany, and the Czech Republic, as well as in other countries, and has more or less directly influenced their academic careers but also their personal lives – in much the same way that his academic mentors mentioned above have influenced his own.

Let me close this review by saying a few words about my qualification for writing this report. I was not a fellow student of Hynek myself, having studied at the Czech University of Life Sciences, but because of my interest in bats I attended some seminars at the Faculty of Science of Charles University. As usual, these seminars were followed by informal discussions (with fellow students, academic supervisors, and guests) in nearby pubs. There and during field trips in search of bats in caves and churches in the Prague area, I got to know Hynek. Gradually, we became friends for life, and our relationship eventually extended to our families. Although Hynek was originally from the East Bohemian lowlands, thanks to the place where he did his military service and thanks to my guidance, he fell in love with the Bohemian Forest (Šumava



Mts.), where he and Jana moved after their retirement. Today we are also neighbors. By the way, one of Hynek's first zoological publications, a short communication, was about the first record of *Microtus subterraneus* (somehow fateful for his later career!) in the Bohemian Forest, a finding he made during his military service in that region. As I wrote at the beginning of this laudatio, I have known Hynek for about fifty years, much longer than the time I did not know him (twenty years). We stayed in touch even during his and his family's stay in Africa, we corresponded regularly (via handwritten paper letters!), and even during the three following years of uncertainty. I was also probably one of the first European zoologists (after Walter PODUSCHKA and perhaps a few others) to have the opportunity to see and photograph African mole-rats live. We live in a symbiosis where Hynek taught me to look at wildlife behaviour and ecology in a new way, and I taught him to consider these animals as a new model for his research.

To conclude, Hynek, I wish you to continue to shine with many original ideas and great research inventions. Above all, I wish you to enjoy your personal life, have good luck and stay healthy for a long time. I wish you, and no less me, to be invited and to have the opportunity to write more laudatios like this one in the next decades, with information about your amazing new discoveries!

Taxa described by Hynek Burda

Genus-group name

Fukomys Kock, Ingram, Frabotta, Honeycutt et Burda, 2006 (Rodentia: Bathyergidae)

Species-group names

Cryptomys anelli Burda, Zima, Scharff, Macholán et Kawalika, 1999 (Rodentia: Bathyergidae)

Cryptomys kafuensis Burda, Zima, Scharff, Macholán et Kawalika, 1999 (Rodentia: Bathyergidae)

Taxon described after Hynek Burda

Eimeria burdai Koudela, Šumbera et Sedláček, 2000 (Apicomplexa: Coccidia)

Photos by J. ČERVENÝ or the family archive of Hynek BURDA.

p. 9: Hynek as a zoo keeper during his university studies, Dvůr Králové Zoo, 1972 (left); in the Šumava NP in 2012 (right); p. 10: Hynek's 50th birthday party (from left to right: HB, František SEDLÁČEK, Leo SIGMUND, Martin BRANIŠ); p. 11: PhD Thesis defence by Mathias KAWALIKA in 2004 (from left to right: Friedemann SCHRENK, HB, MK, Herwig LEIRS, Guido Benno FEIGE); p. 12: Hynek teaching the "Anatomy for Cooks", 2013; p. 13: Hynek with Jaroslav ČERVENÝ measuring the geographical alignment of big mammals in the Botswana field, 2012.