



FishBase



Naturhistoriska
riksmuseet

FishBase Symposium 2015

Captivating Fishes

Programme

Speaker Presentations and Abstracts

Participant list

Monday 19th October 2015

Main auditorium, Swedish Museum of Natural history, Stockholm

Fängslande Fiskar

Program

Presentation av talare och abstracts

Deltagarlista

Måndag 19:e oktober 2015

Stora hörsalen, Naturhistoriska riksmuseet, Frescativägen 40, Stockholm

FishBase Sweden
Naturhistoriska riksmuseet
Box 50007
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fishbase@nrm.se
08-5195 40 00

FishBase Symposium 2015 — Captivating Fishes

Programme

- 09:00 - 09:30 Registration, coffee and sandwiches
Moderator: **Kjell Fohrman**, Aquarium consultant.
- 09:30 - 09:35 Opening, **Michael Norén**, FishBase Sweden.
- 09:35 - 10:20 **Svein Fossaa**, Author and freelance biologist: *Aquarium keeping in the 21st Century: does it have a future?*
- 10:20 – 10:50 Fruit break
- 10:50 – 11:35 **Brian Zimmerman**, ZSL London Zoo: *The European Association of Zoos and Aquariums regional collection planning process – one strategy for saving the most threatened freshwater fishes from extinction.*
- 11:35 – 12:20 **Frank Kirschbaum**, Humboldt-Universität zu Berlin: *Cyclical reproduction in freshwater fishes: tropical freshwater fishes versus sturgeon.*
- 12:20 – 13:20 Lunch break
- 13:20 – 14:05 **Scott Dowd**, New England Aquarium: *The home aquarium industry as an instrument of conservation.*
- 14:05 – 14:50 **Björn Källström**, Maritime Museum & Aquarium: *Towards a new conservation strategy - distributed living gene banks in public and private aquariums.*
- 14:50 – 15:20 Coffee break
- 15:20 – 16:05 **Björn Frostell**, KTH Royal Institute of Technology: *Fish – part of an alternative animal husbandry?*
- 16:05 – 16:50 **Anders Kiessling**, Swedish University of Agricultural Sciences: *Aquaculture the missing link in circular production systems.*
- 16:50 – 17:00 Symposium Close

Time: Monday, 19th October 2015, 09:00 – 17:00.

Place: Main Auditorium (Stora hörsalen), Swedish Museum of Natural History, Frescativägen 40, Stockholm.

FishBase Symposium 2015 — Fångslande Fiskar

Program

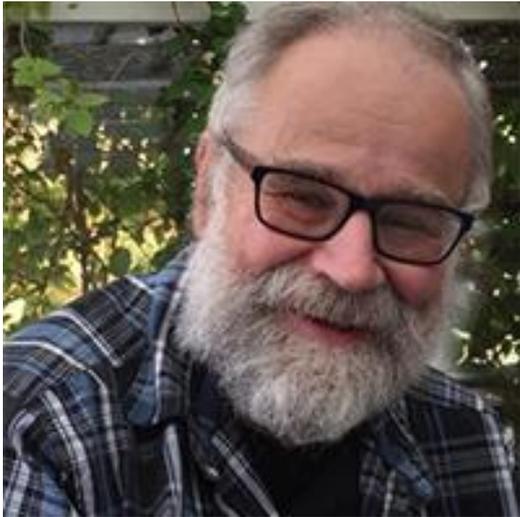
- 09:00 - 09:30 Registrering, kaffe och smörgås
Moderator: **Kjell Fohrman**, akvariekonsult.
- 09:30 - 09:35 Inledning, **Michael Norén**, FishBase Sweden.
- 09:35 - 10:20 **Svein Fosså**, författare och biologkonsult: *Aquarium keeping in the 21st Century: does it have a future?*
- 10:20 – 10:50 Fruktpaus
- 10:50 – 11:35 **Brian Zimmerman**, ZSL London Zoo: *The European Association of Zoos and Aquariums regional collection planning process – one strategy for saving the most threatened freshwater fishes from extinction.*
- 11:35 – 12:20 **Frank Kirschbaum**, Humboldt-Universität zu Berlin: *Cyclical reproduction in freshwater fishes: tropical freshwater fishes versus sturgeon.*
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- 13:20 – 14:05 **Scott Dowd**, New England Aquarium: *The home aquarium industry as an instrument of conservation.*
- 14:05 – 14:50 **Björn Källström**, Sjöfartsmuseet Akvariet: *Towards a new conservation strategy - distributed living gene banks in public and private aquariums.*
- 14:50 – 15:20 Kaffepaus
- 15:20 – 16:05 **Björn Frostell**, KTH Kungliga Tekniska Högskolan: *Fish – part of an alternative animal husbandry?*
- 16:05 – 16:50 **Anders Kiessling**, Sveriges Lantbruksuniversitet: *Aquaculture the missing link in circular production systems.*
- 16:50 – 17:00 Avslutning

Tid: Måndag 19:e oktober 2015, 09:00 – 17:00.

Plats: Stora hörsalen, Naturhistoriska riksmuseet, Frescativägen 40, Stockholm.

KJELL FOHRMAN

Moderator



Kjell Fohrman föddes 1950 och han har under större delen av sitt vuxna liv hållit på med olika husdjur, främst akvariefisk. Han bor idag i Jonsered utanför Göteborg, Sverige.

Under 70-talet startade han en akvariefiskodling på hobbybasis. Denna växte väldigt snabbt och snart blev hobbyn även ett yrke och en akvarieaffär startades. Affären växte och fler djur kom in i bilden som smådjur, fåglar, terrariedjur etc. Under andra halvan av 80-talet var han med om att starta Europas då största zooaffär. Denna sålde han senare och startade istället en grossistverksamhet (akvariefiskar och akvarie-tillbehör). Grossistverksamheten utvecklades snabbt och förutom firman i Sverige startade han ett grossistföretag inom

akvaristik i Tyskland. Under denna period var han bl.a. med om att introducera Back to Nature akvariebakgrunder och böcker i en mängd länder.

I slutet av 90-talet såldes grossistverksamheten och han har sedan dess varit konsult inom akvaristik, gett ut Back to Nature böckerna samt drivit en akvaristisk hemsida zoopet.com som idag dagligen har ca. 3.000 besökare.

Under alla år har han varit aktiv på olika nivåer i flera ideella föreningar, bl.a. en tid som ordförande i Nordiska Ciklidsällskapet och redaktör för deras tidning "Ciklidbladet". Under några år var han också ordförande i Zoorf (Zoobranschens riksförbund) samt i SPTU (Scandinavian Pet Trade Union), och då även redaktör för deras tidning "Pet Scandinavia".

Under årens lopp har han skrivit mer än 1.000 artiklar i olika akvarietidskrifter, hållit flera hundra akvarieföredrag, skrivit flera akvarieböcker, samt även haft utbildningar för personal anställda i akvarieaffärer.

SVEIN A. FOSSÅ

Author and freelance biology consultant, Norway



Svein A. Fosså, born 1959, is a biologist (ichthyologist), eager aquarist since childhood, and a leading international voice for responsible and sustainable practices in the ornamental aquatic trade.

Svein has worked for and with the pet- and ornamental aquatic trade since 1986. In 1992 he started his own business as an independent author and advisor on aquarium technique, ichthyology, and pet- and ornamental aquatic trade policies and legislation worldwide.

Svein lectures regularly in many countries, and has authored and co-authored more than 400 articles, reports and other publications, including several internationally acclaimed books on marine aquarium keeping. Besides commissions for companies and institutions, Svein is currently President of the European Pet Organization (EPO), Secretary General of the Norwegian Pet Trade Association (NZB), co-organizer of the Norwegian ZooExpo trade shows, co-editor of the pet trade magazine PetScandinavia, and a member of the boards of the Ornamental Fish International (OFI), and the Scandinavian Pet Trade Union (SPTU). In the past he was also involved with the Marine Aquarium Council (MAC) as a Board member, and a liaison contact for Europe.

Svein has worked much on ethical and animal welfare issues related to the trade in live companion animals in general, and the ornamental aquatic trade in particular. He has been studying “man-made” ornamental fishes, produced by selective breeding, genetic engineering and physical manipulation. He is involved with issues of sustainable trade, invasive species and nature conservation in the ornamental aquatic trade, and he is OFI's official delegate on meetings relating to CITES.

Svein was born and raised in Norway, where he continues to live with wife and two children, in the small coastal town of Grimstad.

AQUARIUM KEEPING IN THE 21ST CENTURY: DOES IT HAVE A FUTURE?

The keeping of fish for ornamental and hobby purposes has a long history, going back at least to ancient Egypt and Rome, and quickly developing into what we know as modern style aquarium keeping during the latter part of the 19th century in Europe. The availability of suitable and conditioned animals, as well as the knowledge about their biological demands, availability of technology and understanding of welfare has never been larger than today. Still the institution of fish keeping has also never been so heavily criticised as today. This talk looks at the state of present day home aquarium hobby and -trade, where the fish come from and how it is treated, and points out some of the challenges from conservation-, bioethics- and animal rights views. The overriding question is whether the individual and societal benefits gained from aquarium keeping are significant enough to justify its future.

BRIAN ZIMMERMAN

ZSL London Zoo, United Kingdom



Brian Zimmerman has been the Curator of the Aquarium at the Zoological Society of London since 2007. Prior to that, he was the Team Leader at ZSL, starting in 1999. He previously worked in other aquarium collections and in his early career worked in the USA as Education Coordinator for Dallas Zoo and Dallas Aquarium. He spent two years on the small West Indian island of Nevis working for the US Peace Corps as a teacher of environmental education. He has a degree from the University of Wisconsin in Natural Resource Management. In Brian's role at ZSL he not only manages the Society's fish and aquatic invertebrate collection but also leads the Fish Net project which focuses on freshwater fish conservation around the world with key projects in Greece, Turkey and Madagascar. He has done biodiversity surveys in freshwater ecosystems around the world in places such as Liberia, Madagascar, Nepal, Brazil and Turkmenistan. He is a member of the IUCN's Freshwater Fish

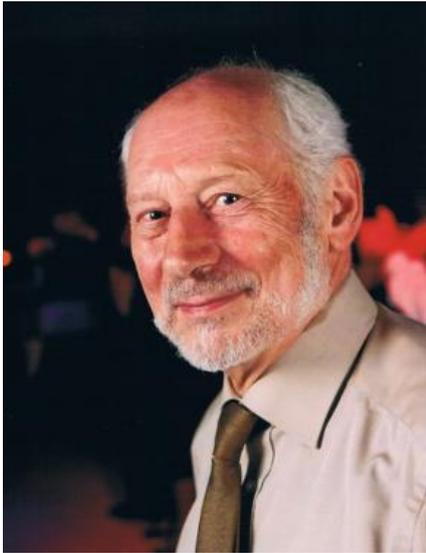
Specialist Group, the Chair of the European Association of Zoos and Aquariums' FAITAG (Fish and Aquatic Invertebrate Taxonomic Advisory Group), sits on the Conservation Committees for EAZA and the European Union of Aquarium Curators, and is a member of EAZA's Translocation Working Group, Welfare Group and Transport Group. He has consulted for other zoos and aquarium including Barcelona Zoo, Jerusalem Zoo and Kastoria Aquarium and Crete-aquarium in Greece. His favourite fish is the La Palma pupfish.

GENETIC AND ENVIRONMENTAL COMPONENTS OF FISH SEX DETERMINATION AND DIFFERENTIATION

Regional collection planning (RCP) is a tool used by zoos and aquariums around the world for population management of the species they keep. The relatively small captive populations held in each institution form a larger metapopulation in the regional collection that improves the long-term genetic viability of these species in captivity. Traditionally the RCP was used primarily to ensure that zoo animals no longer were obtained from the wild. However in recent years these metapopulations are being managed for conservation purposes. The European Union of Zoos and Aquariums (EAZA) Fish and Aquatic Invertebrate Taxonomic Advisory Group (FAITAG) recently held an RCP workshop aimed at freshwater fishes. The workshop was attended by a variety of specialists concerned with freshwater fish conservation – from the zoo/aquarium community, research institutes, universities and the aquarium hobby sector. The workshop identified priority species for which a captive management plan was deemed essential in order to safeguard their future. The presentation will discuss the process of Regional Collection Planning and highlight some of the challenges and opportunities.

FRANK KIRSCHBAUM

Humboldt University Berlin, Germany



Prof. Dr. Frank Kirschbaum. Studies in Zoology, Botany, Chemistry, and Genetics at Cologne and Tübingen Universities. PhD on color pattern of zebra fish at Cologne University (1972). Postdoc at the French CNRS for five years on reproduction and development of weakly electric fishes (South American knifefishes, African mormyrids). 10 years as Assistant Professor at Cologne University. Then for 3 ½ years at Free University in Berlin working on lower vertebrates as model organisms for teratological studies. From 1992 – 2007 head of the Department Biology and Ecology of Fishes at Leibniz-Institute of Freshwater Ecology and Inland Fisheries and Professor at Humboldt University Berlin. In particular studies on the restoration of the European sturgeon, *Acipenser sturio*, in Germany. Since 2007 retired; continuation of teaching and research at Humboldt University.

CYCLICAL REPRODUCTION IN FRESHWATER FISHES: TROPICAL FRESHWATER FISHES VERSUS STURGEON

Fish reproduce either continuously once they have attained sexual maturity or they reproduce once sexually mature cyclically depending on environmental factors triggering gonadal recrudescence. In this talk data on the cyclical reproduction of some freshwater fishes are presented. The cyclical reproduction of tropical freshwater fishes (South American knifefishes, African mormyrid fishes, African and Asian catfishes) is triggered by environmental factors such as conductivity, water level, and imitation of rain factors which vary in relation to the occurrence of dry and rainy season conditions. Sturgeon (27 species are recognized) also reproduce cyclically, however, the ripening of the gonads, in particular in the females, often takes more than one year and is triggered by temperature changes. Successful artificial reproduction in the European sturgeon, *Acipenser sturio*, has allowed to start restoration measures in European Rivers, in particular in France and Germany.

SCOTT DOWD

New England Aquarium; Project Piaba; IUCN/FFSG/Home Aquarium Fish Sub-group



Scott Dowd has served as a biologist at the New England Aquarium (NEAq) since 1987. He also co-founded, and is now Executive Director of Project Piaba [s1] (piaba is the local name for the ornamental fish). The Mission of Project Piaba is to increase the environmental, animal welfare, and social sustainability of the Amazonian aquarium fish trade, to develop and incorporate metrics through which this progress can be assessed, and to provide mechanisms to promote this industry. Project Piaba's work is also featured on the NEAq website, and on Facebook.

THE HOME AQUARIUM INDUSTRY AS AN INSTRUMENT OF CONSERVATION

Throughout the tropics many communities base their livelihoods on the capture and export of living aquatic organisms for the global trade in specimens for the home aquarium hobby. This industry, based on the collection of living animals for the sole purpose of a hobby, entertainment, parlour decor, is indeed controversial. In fact EU Parliamentary Members are currently considering legislative controls, especially in regard to wild-sourced stocks. For more than 25 years, Project Piaba has been studying the aquarium fishery of the Rio Negro Basin, Amazonas State, Brazil. Findings have shown that the fishery represents little to no threat to fish populations. Beyond that, the fishery resource provides the basis of livelihoods for the majority of regional residents. Human welfare is directly tied to environmental welfare via the fish, which has resulted in a very effective driver of environmental stewardship. The protection from fishers is directed towards the entire ecosystem that the fishes depend on. The forest ecosystem is also critical habitat for many critically endangered species. There are incalculable quantities of carbon sequestered in the trees protected by the fishers and the tropical forest continues atmospheric scrubbing processes. Outcomes: poverty alleviation, protection of areas of critical biological importance that would otherwise likely be lost, and mitigation for climate change. These accomplishments that have been documented in the Rio Negro fishery are not unique to this region. It is clear that variations of the model exist throughout the tropics. Zoos and aquariums are in an extremely good position to foster these beneficial outcomes by showcasing these examples to our visitors in our programs and exhibits. By fostering the market demand for beneficial aquarium fishes, we can have a positive impact on people and ecosystems in regions most important to us.

BJÖRN KÄLLSTRÖM

Maritime Museum & Aquarium, Sweden



Björn Källström is a marine biology researcher and head of the Aquarium at the Maritime Museum & Aquarium in Gothenburg, Sweden. Björn is an active PADI open Water Scuba Instructor and an Advanced European Scientific Diver (AESD). He is involved in the development of scientific diving in Sweden and is a member of the Swedish Scientific Diving Panel as well as the management board for the Vocational Diving Training School (YRGO) in Gothenburg. Björn is also involved in the development of the Underwater Observatory in the Gullmarn fjord at the Swedish west coast. Björn's research focuses on conservation genetics of marine species including seagrasses, sharks and stony corals. Björn has founded the Aquarium Oceanographic Laboratory which makes it possible to combine the public part of the aquarium at the Maritime Museum & Aquarium with scientific research on marine organism and to

start conservations projects for threatened species.

TOWARDS A NEW CONSERVATION STRATEGY - DISTRIBUTED LIVING GENE BANKS IN PUBLIC AND PRIVATE AQUARIUMS

Marine species are subjected to many different stressors, including climate change, ocean acidification and over fishing, which threatens natural populations and species with extinction. In order to save species from extinction in the wild conservation projects can include threatened species held in captivity in aquariums as living gene banks. The objective of this project is to use existing private and public aquariums to build distributed repositories for threatened marine species. The species in the repositories will be used to start breeding programs and for research to investigate taxonomy, genetic diversity and resilience to different stressors. The repositories are distributed since they include specimens held in private as well as in public aquariums. An important component in the projects is to gather and document the acquired knowledge from the private aquarist of how to best keep marine species in captivity, including successful culturing and breeding techniques.

In order to investigate the feasibility of the distributed repository model we have created an ex-situ, distributed repository of tropical stony corals in Swedish public and private aquariums. We have collected genetic data (nuclear microsatellite data and mitochondrial sequence data) from 30 coral clones of the Birds nest coral, *Seriatopora hystrix*. The corals in the investigation were provided both by private aquarists as well as by public aquariums in Sweden. The results from the investigations show that there are unexpectedly high genetic diversity in Swedish aquariums measured as clonal diversity and allelic richness. The results also indicates that the Swedish mitochondrial haplotypes are most similar to an "Upper Slope genotypes" growing on medium depths in wild populations of *Seriatopora hystrix* at the Great Barrier Reef. In order to investigate the resilience of the corals in the repository to ocean acidification a sub sample of the clones were subjected varying levels of pH (7,5 – 8,4) in controlled experiments. The results from the ocean

acidification experiments showed a reduced growth with lowered pH-values, indicating that *Seriatorhina hystrix* is sensitive to ocean acidification.

In another investigation we used an existing repository of the Small spotted catshark (*Scyliorhinus canicula*) in public aquariums in Sweden. The sharks in the repository are used in a conservation project aiming at restocking Swedish wild populations. The project suffers from a low number of breeding individuals which potentially results in low genetic diversity in the offspring. Molecular data was collected from sharks from three public aquariums in Sweden and from sharks imported from a research aquarium in France to be eventually included in the breeding program. The sequence data was also compared to published genetic sequences from wild populations. Preliminary results from the study indicate that sharks in the study, from Sweden and France, belong to the same genetic population and that the French sharks potentially can be included in the breeding program in order to increase genetic diversity.

BJÖRN FROSTELL

Royal Institute of Technology (KTH), Sweden.



Björn Frostell has his affiliation as a Professor in Industrial Ecology at KTH in Stockholm. Industrial Ecology is a young science that tries to understand society's physical resource metabolism (energy and materials) and maintain it within ecologically sustainable boundaries. Important aspects of Björn Frostell's work cover the identification and quantification of important physical resource flows. A long term aim of the work is to contribute to the introduction of physical resource accountings in society – and technical and organizational means to manage important physical resource flows at different administrative levels. Björn Frostell's interest in fish and fish cultivation stems from a belief that future protein supply to humanity has to become more resource efficient than today. Much evidence points at the possibility that fish could be produced with much

less use and wastage of physical resources than meat and thus could contribute to a more sustainable protein supply.

FISH – PART OF AN ALTERNATIVE ANIMAL HUSBANDRY?

Man's consumption of meat, pork, mutton and poultry (in general tissue from land-living animals and here referred to as meat) is rapidly increasing. The main drivers behind this development are (i) a rapidly increasing world population and (ii) a rapidly increasing global economic growth, both as such and per capita. However, meat consumption is accompanied by an intense use of different physical resources such as energy, water, fertilizers and chemicals. It is now being increasingly questioned whether meat consumption on earth can increase in the same way as hitherto. Fish is an alternative source of valuable protein and an important protein source for many populations. However, global fishing already since 25 years surpasses the sustainable level of fish harvest from seas, lakes, rivers and ponds. This has led to fish aquaculture being one of the most rapidly growing businesses worldwide, with an annual growth rate of up to 20 %. This development is, however, not without problems. Current trends point at an increasing scale of operations, resulting in both doubtful animal ethics and environmental problems. Invasive organisms are difficult to control and the inefficient resource eco-cycles in flow-through systems cause environmental problems with nutrient overload and local accumulations of fish feed residues and fish faeces. Here, combinations of fish cultivation and horticulture could provide interesting future prospects. The presentation tries to cover both the possibilities with an increased fish supply and the challenges caused by current large scale operations. Will it be possible to develop a profitable small-scale (50-100 tons of fish per year) closed loop protein and vegetable production system where fish is our new domestic animal?

ANDERS KIESSLING

Swedish University of Agricultural Sciences (SLU), Sweden



Anders Kiessling has been Faculty Professor in Aquaculture at the Swedish University of Agricultural Sciences, since 2011.

Through his career his research has been nutrition, product quality and welfare in farmed fish but present main focus is sustainable animal feed sources, as bio-protein and feed mussel meal, in combination with integrated and multi trophic farming systems. He has published 100 articles in peer reviewed journals. Among international assignments, he has been MC member, vice-chair and chair of COST networks in meat and fish quality, fish nutrition, and welfare of farmed fish, respectively before becoming a DC member. At Baltic Sea level he represents aquaculture in the Bonus Drafting team, in HELCOM he is activated in the dialogue related to Baltic wide

aquaculture recommendations. He is a member of the steering comity of the BSR project Aquabest, responsible for the work package, "Closing the nutrient loop". He is a member of the drafting team for the flagship application *Baltic Blue Growth* (feed mussel). At national level he is a member of the Governments National advisory board for aquaculture and was active both as a member of the steering comity of the national action plan for aquaculture and as a member of the expert panel of the Governmental report SOU2009:26, "Sweden an aquaculture nation in making". Internationally he is a member of Stirling University aquaculture advisory group and the main supervisor for aquaculture in the SIDA supported project, Merkan II, with projects both in Cambodia and Vietnam, both related to sustainable feed sources to farmed fish and crustaceans. From 2003 to 2010, he was Professor in fish nutrition at UMB in Oslo, and from 1998 to 2003, Senior Scientist at IMR, Bergen. In 1996, he obtained his Assistant Professorship in aquaculture at SLU. From 1992 to 1998, he was Researcher at SLU, and from 1990 to 1992, did his post doc at DFO, West Vancouver lab. Canada. He got his PhD at SLU in 1990..

AQUACULTURE THE MISSING LINK IN CIRCULAR PRODUCTION SYSTEMS

A growing population, urbanization and rapid globalization of economy pose growing challenges to our food supply. This has up to now been met by intensified agriculture and aquaculture, e.g. involving increased land and water use, crop and species development, mechanization, fertilization and high energy use. This development will have to be at least partially reoriented to less land-intense, less energy-intense and more eco-cycle oriented methods. Other important demands are safety of food supply, high food quality and an ethical handling of animals. This presentation focuses the role of aquaculture in this development. By combining terrestrial and aquatic closed and semi closed systems into integrated and multi trophic farming systems utilizing no arable land, low freshwater resources and waste streams of energy and nutrients it is possible to formulate sustainable and circular systems possible to locate in both urbane and more rural settings.

Deltagarlista FishBase Symposium 2015

Talare:

Scott Dowd, New England Aquarium, Boston, USA
Svein A. Fosså, Akvariekonsulent, Grimstad, Norge
Björn Frostell, KTH
Anders Kiessling, Sveriges lantbruksuniversitet
Frank Kirschbaum, Humboldt-Universität zu Berlin, Germany
Björn Källström, Sjöfartsmuseet Akvariet Göteborg
Brian Zimmerman, London Zoo, UK

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Emma Asterhag Stockholms universitet
Samuel Avraham Stockholms universitet
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Gunnar Berglund Stockholms stad
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