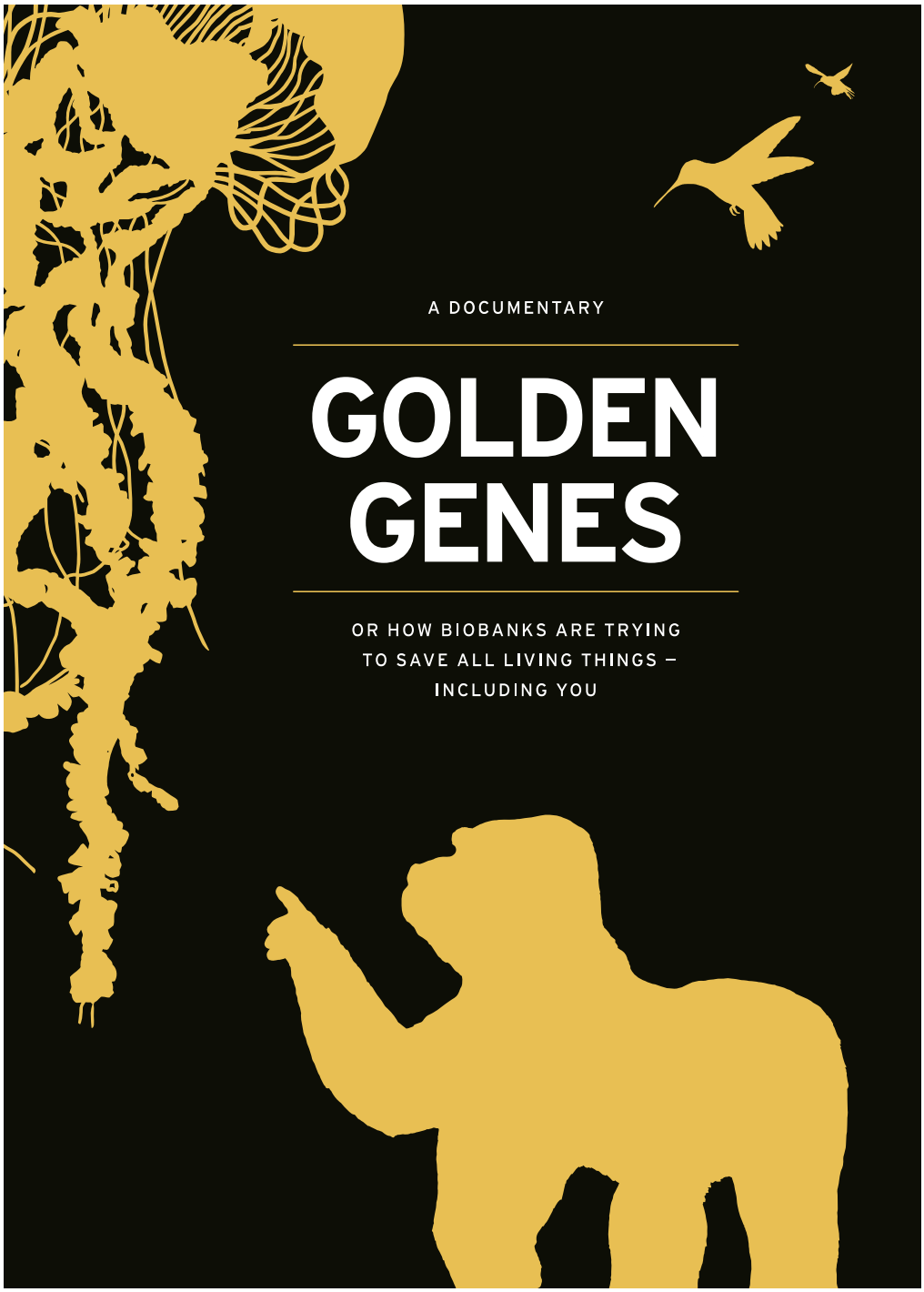

Press Kit

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GOLDEN GENES
OR HOW BIOBANKS ARE TRYING TO SAVE ALL LIVING THINGS – INCLUDING YOU
A Documentary by
Ursula Hansbauer, Wolfgang Konrad, Clemens Stachel
Press Kit

Contents

Synopsis (short)

The frozen, bodiless genes of millions of plants, animals and humans are stored in biobanks around the world. They rekindle dreams of old: re-creating extinct species, ending world hunger, human life without illness or disease. But biobanks do more than that. They pose a fundamental question to our contemporary beliefs: What does it mean to be part of nature in the age of the genome?

Saving the DNA of all life on Earth will be one of the greatest international research projects of coming decades. **Golden Genes** – part nature film, part political documentary – demonstrates the extent to which biodiversity research is not only challenging human society but also our very conception of humankind.

Synopsis (long)

The frozen, bodiless genes of millions of plants, animals and humans are stored in biobanks around the world. Together with corn seed, the stem cells of polar bears and frozen drops of human blood – rekindled dreams of old are travelling towards potential futures: re–creating species threatended with extinction, ending world hunger, and human life without illness or disease.

The documentary film **Golden Genes** embarks on an expedition to some of the largest, oldest and most contemporary archives of life – from the Svalbard Global Seed Vault in Spitsbergen, to the animal cell banks of the Fraunhofer Institute in Germany, and the largest biodiversity storage in the world in Shenzhen, China. Biobanks such as these are data centres in the global network of the genetic research community. The information that they generate from the DNA of various living organisms provides the basis of today's life sciences.

But biobanks do more than that. Within their freezers the boundaries between lifeforms are blurred. Fungal, bacterial, or human – it's all the same to the technology. Biobanks pose a fundamental question to humankind: what does it mean to be part of nature in the age of the genome?

Things that were unthinkable 20 years ago are discussed by scientists interviewed in the film as concrete research projects. The storage of every DNA molecule on the planet – an idea closely related to the century-old history of genetics – has now become a real possibility.

Caught somewhere between nature film and political documentary, **Golden Genes** outlines the enormous challenge that the comprehensive study of biodiversity presents to society, but also to our image of humankind.

Directors' Statement

Collecting, classifying and archiving – those are the activities of modern biobanks. The things collected, however, are not the lifeforms themselves; there are no insects on pins or pressed plants in books. What is collected and stored is information on life in its purest form – DNA.

As people who grew up in Europe in the 1970s and 80s, the three of us witnessed first-hand a changing attitude towards nature. Issues such as species extinction, environmental protection and the conservation of biodiversity – receiving ever greater attention – helped to sharpen our sense of the political and shape our image of the world.

It is perhaps no coincidence that both of these grand social narratives picked up speed at the beginning of the 21st century. On the one hand, people's desire for a more genuine approach to nature as a larger whole; on the other, the rapid advance of the scientific understanding of life as a complex, networked interaction of the smallest molecular processes: We are all one. And we are all unique.

We have been fascinated for quite some time with the enormous gene storage centers that have been created all over the world; the sheer scale of them, which, alone during the film's research period, increased at a remarkable pace. In autumn 2014, in the Chinese city of Shenzhen, while filming the construction of the world's largest gene bank, the dimension of our film's topic shifted once again before our eyes. One sensed it immediately; here the future was being constructed.

Biobanks, in our view, are not simply centers of international genetic research. They are also, and above all, the screen upon which the future of our society is being projected [[a projection of the future of our society]]. Who could have anything against the conservation of a rare variety of Peruvian tomato? Why not place the DNA of the last polar bears in cryogenic freezers? Could it be that, hidden inside the DNA of an insect, one that we perhaps don't yet recognize, the key to a cure for cancer might be found? Should one therefore try and carefully place every single insect DNA molecule into storage? Could better medical treatment be provided if a newborn child's DNA was immediately analysed and frozen? Should everyone, wherever possible, sequence their genome and input the information in a global database?

The questions that our film circles are fundamental questions concerning our image of nature and our image of humanity. As filmmakers we take no explicit position and offer no clear answers. It is important for us to have a discussion, one that avoids false scandalizing, and focuses instead on how genetic science and its molecular view of life can and will change our world.

Ursula Hansbauer, Wolfgang Konrad, Clemens Stachel
Vienna, June 2016

The Protagonists

Ann Clarke
Zoologist, Immunologist
Co-Founder of The Frozen Ark, a consortium at the University of Nottingham (GBR) which organizes the collection and storage of DNA from endangered animal species.

Rory Collins
Epidemiologist
Professor of Medicine and Epidemiology at the University of Oxford (GBR), CEO and Principal Investigator of UK Biobank, the largest population genetic long-term study in the world with 500,000 participants.

Nikolai Dzyubenko
Botanist
Director General of the N.I.Vavilov Institute of Plant Industry in St. Petersburg (RUS) where the world's first systematic collection of crops was established in the 1920s.

Cary Fowler
Agriculturalist
Former Executive Director of the Global Crop Diversity Trust (GCDT) and initiator of the Svalbard Global Seed Vault (NOR), the world's largest biobank for cultivated plant seeds.

Günter R. Fuhr
Biophysicist
Director of the Fraunhofer Institute for Biomedical Engineering (IBMT) in St. Ingbert and Sulzbach (GER) where – among other projects – the German Cell Bank for Wildlife „Cryo-Brehm" is accomodated.

Herbert Gottweis (passed away in 2014)
Political scientist
Professor at the Institute for Political Sciences at the University of Vienna (AUT) and one of the most renowned observers of gene technology and biobanks from a sociological and political perspective.

Pierre-Henri Gouyon
Geneticist, Botanist, Agronomist
Professor at the Museum national d'Histoire naturelle and at Sciences Po in Paris (FRA).

The Protagonists (cont.)

Ruaraidh S. Hamilton
Evolutionary Biologist
Head of the Genetic Resources Centre in the International Rice Research Institute (IRRI) in Los Baños (PHN) and an expert on the diversity and breeding of rice.

Berthold Huppertz
Cell Biologist
Director of Biobank Graz (AUT), the largest medical biobank in Europe with more than five million samples.

Hans-Peter Klenk
Biochemist, Microbiologist
Head of the School of Biology at Newcastle University (GBR), former Head of the Department of Microorganisms at the Leibniz Institute DSMZ (German Collection of Microorganisms and Cell Cultures) in Braunschweig (GER).

Boris Makarov
Botanist
Gene Bank Manager at the N.I.Vavilov Institute of Plant Industry in St. Petersburg (RUS) where the world's first systematic collection of crops was established in the 1920s.

Stephen J. O'Brien
Geneticist
Chief Scientific Officer at the Theodosius Dobzhansky Centre for Genome Bioinformatics at the St. Petersburg State University (RUS), co-founder of the Genome 10K project which aims to assemble a collection of DNA sequences of 10,000 vertebrate species.

Tim Peakman
Deputy CEO of UK Biobank, the largest population genetic long-term study in the world with 500,000 participants.

Christa Schleper
Microbiologist
Head of the Archaea Biology and Ecogenomics Division of the Department of Ecogenomics and Systems Biology at the University of Vienna (AUT) and one of the world's leading researchers on archaea.

The Protagonists (cont.)

Jian Wang
Geneticist
Co-Founder and President of BGI in Shenzhen (CHN), one of the largest research institutes in the field of genomics and one of the most important genome sequencing centres in the world.

Kurt Zatloukal
Pathologist
Professor of Pathology at the Medical University of Graz (AUT), Co-Founder of Biobank Graz, former coordinator of the European Biobanking and BioMolecular Resources Research Infrastructure (BBMRI), and Director of its Austrian node, BBMRI.at.

Xin Zhou
Evolutionary Biologist
Head of the Environmental Genomics research group at BGI Shenzhen (CHN) and Director of the China National GeneBank, the largest biobank in the world, which is situated in BGI's proximity in Shenzhen.

Quotes from the Film

"If we imagine a collection of all mammals with, let's say, 40 samples of every species, then such a collection would fit into four to six cryotanks such as the ones we have here at the institute."
Günter R. Fuhr

"In the 1920s, it was thought that a plant variety had a limited lifespan for cultivation. Nikolai Vavilov was the first scientist who believed that we absolutely have to preserve these old varieties. He said that, at some point in the future, their genetic diversity would become the source for new varieties."
Nikolai Dzyubenko

"We have always questioned whether humanity is a part of nature. I think it has become impossible today to separate the human world from the natural world."
Pierre-Henri Gouyon

"Sequencing the human genome was probably the world's greatest scientific discovery. There is only one basic genetic code. And the technique is there to sequence all life on earth."
Ann Clarke

"The advancement of molecular biology in the 1970s brought with it a completely new view of the human being. The molecular element came to the fore, and scientists began to look for certain genes that may cause diseases."
Herbert Gottweis

"Going by number of cells, there are ten times more bacterial cells in and on our bodies than our own human cells. So the question crops up, what actually is a human being? You could say that we are a superorganism of Homo Sapiens plus many bacteria."
Christa Schleper

"Imagine the realistic future scenario where not only large genome centres generate biological data, but it can be done by anyone. And people can compare their data with large databanks using their mobile phones."
Kurt Zatloukal

The Directors

Photograph: Alexander Chitsazan

Ursula Hansbauer (born in 1973 in Salzburg) studied conceptual art at the Academy of Fine Arts in Vienna and at the National Academy of Arts in Sofia.

Wolfgang Konrad (born in 1974 in Graz) studied at the School of Photography Friedl Kubelka in Vienna as well as conceptual art at the Academy of Fine Arts in Vienna and at the National Academy of Arts in Sofia.

Working together since 1999, Hansbauer and Konrad have realised numerous exhibitions and media installations. Recurrent themes in their work are the human-nature relationship, changing perceptions of life and nature through history as well as the political and societal implications of the life sciences.

Filmography:
Golden Genes, documentary, 90 min, 2016
Forst, documentary, 50 min, 2005, in cooperation with Ascan Breuer, Ben Pointeker, Julia Lazarus, Clemens Stachel
Cartographies of Life, video for an exhibition, 30 min, 2002

Clemens Stachel (born in 1974 in Wiener Neustadt) studied history and media sciences in Vienna and Lyon. He works as a freelance journalist in Vienna and has collaborated in different art and film projects.

Filmography:
Golden Genes, documentary, 90 min, 2016
Forst, documentary, 50 min, 2005, in cooperation with Ascan Breuer, Ursula Hansbauer, Wolfgang Konrad, Ben Pointeker, Julia Lazarus
The Voice, documentary audio-film, 60 min, 2002, in cooperation with Ralo Mayer, Elke Auer, Ascan Breuer

Credits

A Film by
Ursula Hansbauer, Wolfgang Konrad, Clemens Stachel

Camera
Leena Koppe

Music
Barbara Konrad and Klaus Lang

Voice
Anne Kozeluh (english version), Eva Löbau (german version),

Sound Mixing & Sound Design
Christoph Amann

Colour Grading
Andreas Daxer

Research Assistance
Julia Wieger, Barbara Zorman

Technical Support
Lukas Böck

Titles
Philipp Haupt

Voice Recording
Ramin Bijan

Interpreters
Galina Karalyun, Ling Ling Xu

Translation & Transcription
Billy Badger, Sandra Benecchi, Martine Carée, Lina Dokuzović, Kevin Dooley, Katrin Igelsböck, Sarah Mazet, Tom Sköld, Martin Udovičić, Weina Zhao

Spitsbergen Guide
Stefano Poli / Poli Arctici

Dramaturgical Advisors
Christa Auderlitzky, Hannes Böck, Julia Pontiller

Script Consulting
Ursula Wolschlager, Robert Buschschwenter (witcraft), Sandra Bohle

Lighting Rental
Ernst Dangl GmbH

Insurance
Aon Jauch & Hübener GmbH / Peter Mayr

Legal Advice
KSW / Thomas Wallentin

Technichal Data

Format: DCP
Running time: 90 min
Image format: 16:9
Sound: 5.1
Original languages: English, German, Russian, French, Chinese
Subtitles: English or German

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BUNDESKANZLERAMT ÖSTERREICH

Das Land Steiermark
Kultur, Europa, Außenbeziehungen

KULTUR NIEDERÖSTERREICH

LAND SALZBURG

WIEN KULTUR

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