



**1/2008** ▶ When Humanity Began to Settle Down ▶ The Secrets of the "Glass Mountain" ▶ A Balancing Act ▶ Where Science Builds Bridges ▶ The Emperor's New Colonies ▶ "Talking About My Generation" **DFG**

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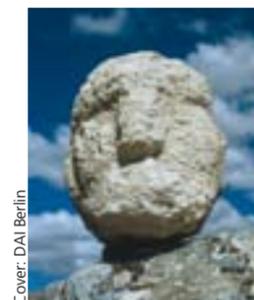
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Cover: DAI Berlin

**Testimonies of Early History of Humanity**

An expressive, larger-than-life sculpture of a human head. At the Göbekli Tepe in Anatolia, archaeologists are studying fascinating Stone Age monuments. **Page 10**

In the beginning was the crisis, and the diagnosis for the crisis. At the dawn of the new millennium, the DFG took a thorough look at the general state of the humanities in Germany. This study revealed two major trends, which reinforced each other in a worrying way when looked at together.

On the one hand, the core support being provided by universities was being cut back. On the other, the principle of performance-related funding allocation within the individual departments and subjects, although a good thing in itself, was in practice based primarily on quantifiable indicators, not least the amount of third-party funding attracted. This was accompanied by the increasing importance given to the issue of direct application and exploitation of the research work and scientific findings – and it is a well-known fact that this is much harder to identify and propagate in the humanities than in the life sciences, natural sciences or engineering.

The humanities had already begun to react to these constraints and had indeed been very successful in attracting third-party funding, sometimes at a high price. All too

often, researchers in the humanities had to accept conditions that were not ideal for the specific way of working in the humanities, which in many cases is not conducive to division of labour and a project-based approach. The intellectual implementation of empirical research in the form of writing a monograph is essentially done by an individual – and the monograph remains the centrepiece of an individual's work in the humanities. Although it does require a certain degree of groundwork and discussion of ideas, that in itself does not necessarily call for large research groups.

Yet it is equally true that – depending on the problem addressed and the objectives of the research – a Collaborative Research Centre may be an appropriate funding instrument in the humanities. However, it is frequently the case that research projects in the humanities are of a different nature, with studies that do not require large-scale funding, but which nevertheless yield important results. Admittedly, anyone who works in this way is bound to be put at a disadvantage by the fixation on third-party funding and the commercial exploitation of results.

This is where the DFG attempted to address the situation by providing the humanities with an entirely new form of support – thus creating entirely new perspectives. The magic bullet was “calibration” of the DFG's funding instruments. The idea was that these instruments would be flexible enough to adapt to the specific methods of working in the humanities, and the specific needs that arise as a result. This gave rise to the “Humanities Research Funding Initiative”, which a working group within the DFG started developing in early 2002, in close collaboration with the scientific community, and was approved by the DFG's statutory bodies a year later.

The pilot phase, approved in 2003, has now come to an end and the measures and instruments brought into being by the initiative were confirmed as permanent institutions, and there is even talk of the possibility of them serving as a model for other disciplines. High time, then, to take stock. The result, however, turns out to have two sides to it. What at first sight appears to be a success story is actually still subject to a variety of threats.

The success side of the coin is that the funding initiative heralded the introduction of four specific measures that were tailor-made to suit the circumstances and the proposals that had been made.

They took the crucial importance of individual research work in the humanities into account by allowing proposals to be submitted for research time in the same way as for projects. The funding this provided for stand-ins simultaneously served to promote young researchers.

Because direct contact to other researchers is often especially problematic in the humanities, especially in the so-called minor subjects, due to the large distances separating the researchers, which is a particular problem for young researchers, the initiative enabled the researchers to establish international networks on specific topics.

Working with a long-term perspective is another specific characteristic of the humanities, for instance when dealing with long and drawn-out archaeological digs, editions and other source materials. The funding initiative created clear rules that were easy to implement and provided the necessary planning security,

without causing the projects to go on ad infinitum. Because large groups such as Collaborative Research Centres are not necessarily appropriate for the situation in the humanities, but enjoy great prominence when it comes to performance evaluation and are generally very important in establishing a profile within the universities, the DFG's “Research Unit” funding instrument was expanded to take the specific needs of the humanities into account. This led to the creation of the new “Kollegforschergruppen” (Humanities Centres for Advanced Studies) in 2007, the Year of the Humanities.

Altogether, these new instruments have been received very well in the research community. The first three have already been evaluated and found to be successful, but for the most recently implemented instrument, the Humanities Centres for Advanced Studies, it is still too early to perform an evaluation, although it is hoped that they will be equally successful. So far, so good!

On the other side of the coin are the threats. Despite the success of the funding initiative, the humanities are still faced with not inconsiderable problems, basically because the unfavourable conditions they faced continue to prevail. Funding cuts, the orientation towards application and the migration towards large groups continue to pose serious difficulties for the humanities.

In a way, the problems have even been exacerbated by the Excellence Initiative by the German federal and state governments to promote science and research at German universities. Although the humanities enjoyed considerable success in the second round of the Excellence Initiative, the fact remains that the Excellence Initiative, at least in part, counteracted the positive developments brought about by the funding initiative. It remains to be seen whether cooperation in very large and in some cases – as is already evident, even at this early stage – over-organised groups is superior to working in more streamlined entities.

The litmus test could be the prospects that open up for the minor sub-

jects as a result of the initiative. Their identity has already at least been damaged by the changes to university courses, thus impairing their chances of survival, if not actually putting them at risk of extinction.

In the end, how they are dealt with will reveal how willing society is to continue benefiting from the enormous and vital potential that the humanities hold. After all, the humanities are not merely the guardians of our own or foreign traditions, they also show us how to deal with them. They translate and mediate between the different cultures with which they have become familiar by detailed study of language, ideas and concepts. In a world where cultural interaction needs to keep pace with economic interdependence the cultural skills a society possesses are especially important, even essential for survival.

With the funding instruments it has developed in recent years, the DFG has demonstrated that it is well aware of these facts, but it remains a challenge – not only for the DFG – to arouse awareness for these facts amongst the general public and, not least amongst the politicians and organisations who are responsible for making science policy.

Many areas of the humanities have already got their back up against the wall. Further cuts will inevitably result in the demise of certain fields of research. There may be universities that take a laid back view of these cutbacks in the range of subjects they offer, but can our society allow itself to be robbed of its ability to reach a deeper understanding of itself, or the ability to genuinely communicate with other cultures?

Prof. Dr. Hans-Joachim Gehrke was the Chairman of the Scientific Advisory Committee for the DFG's Humanities Research Funding Initiative. A renowned ancient history expert, he has been the President of the German Archaeological Institute (DAI) in Berlin since 1 March 2008.

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Hans-Joachim Gehrke

# Precarious Success in the Humanities

*The DFG's funding initiative has given this discipline a boost – but budget cuts and the principle of exploitation remain a threat*

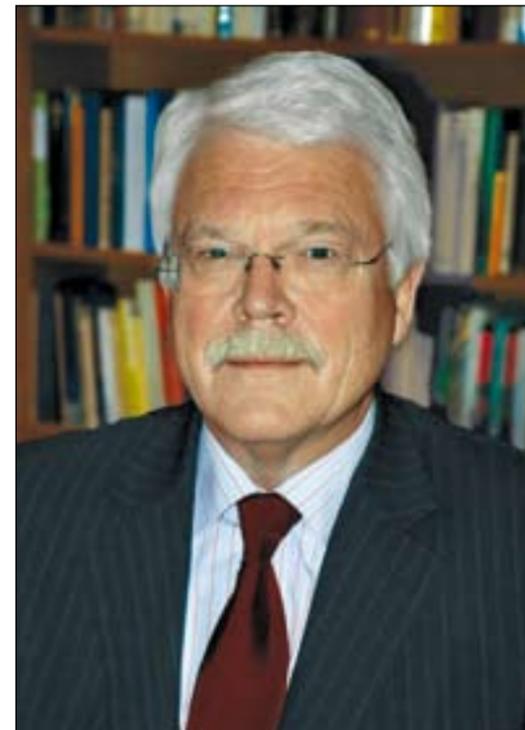
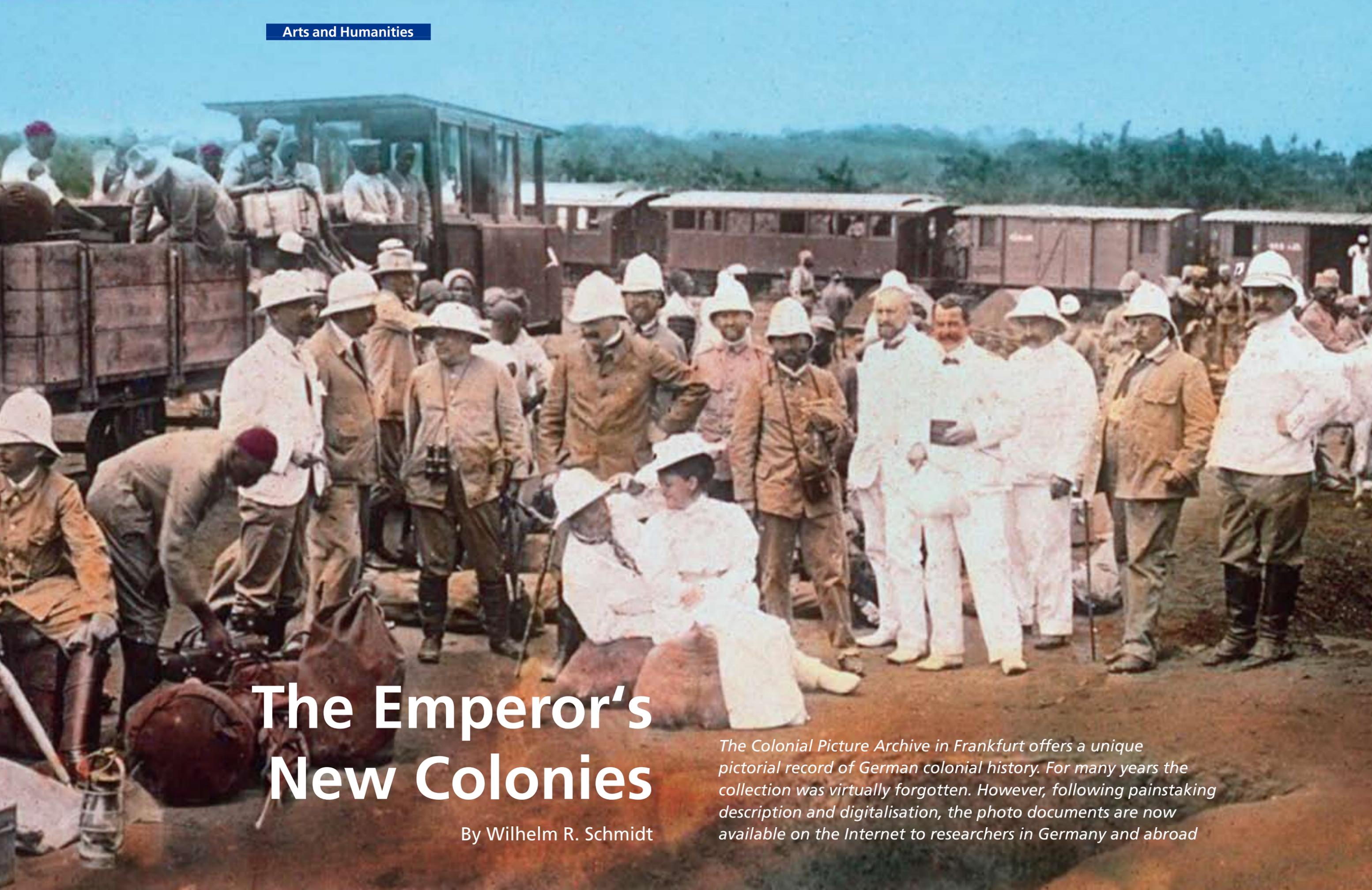


Illustration: DAI



# The Emperor's New Colonies

By Wilhelm R. Schmidt

*The Colonial Picture Archive in Frankfurt offers a unique pictorial record of German colonial history. For many years the collection was virtually forgotten. However, following painstaking description and digitalisation, the photo documents are now available on the Internet to researchers in Germany and abroad*



Portrait of an African family. The photo was probably taken in 1906 in German South West Africa, now Namibia. Settlers, colonial officers and missionaries photographed the indigenous population as well as towns and landscapes in the "German South West." The colony was part of the German Empire from 1884 to 1919.

was the former German Colonial Society, whose inventory was moved from Berlin during the Second World War, initially to an underground shelter in Thuringia and later to the Frankfurt area. They eventually arrived, via the collecting points set up by the American occupation administration in the Rhine-Main district, at the City and University Library of Frankfurt am Main in the new state of Hesse.

However, the beginnings of the collection of colonial images reach back to before the foundation of the German Colonial So-

ciety. In the mid-19th century, researchers and missionaries began photographing the inhabitants and the natural environment of their areas of operation using large-format plate cameras. The German Colonial Society came into existence in 1887. With its domestic and foreign departments, it represented the largest and most influential interest group for the propagation of the idea of German colonialism.

The most important means of publicity available to them was the public lecture. In the 1880s, lectures were already being illustrated using the guest speaker's private glass plate slides. This prompted the society to lay the basis for its own photo collection in 1891, initially with about 100 large-format black and white slides to be used for slide shows. The pool of photos grew rapidly thanks to donations from friends of the Society and to the acquisition of other original and duplicate



City life in 1912: A German bakery and confectionery in the harbour town of Swakopmund. German South West Africa was the only imperial colony before the First World War in which a large number of Germans settled. The prospect of diamonds and copper as well as the opportunity for breeding cattle enticed the immigrants to this country.

and bleaching, salt efflorescence and delamination. Working with nitro film material can be laborious and, due to its high flammability, dangerous. It was foreseeable that deterioration of the collection of images relating to German colonial history would be complete within a few years, if conservation measures were not taken.

The image documents that are now available, following protracted preparatory work, on the website of the Frankfurt University Library refer to almost all of the historical colonial areas. Alongside the African dependencies

images from governmental, commercial and private collections that have mostly been lost today. After the First World War, existing collections were systematically reproduced and incorporated in the inventory of the German Colonial Society. In 1936, as part of national socialist "Gleichschaltung" (forcible coordination), the organisation was merged with the Reich Colonial Society, which was then dissolved in 1943 for reasons of the wartime economy.

The image material of the German Colonial Society forms the basis of today's Frankfurt collection, which also features fairly extensive image documentation of colonial history in, for example, South America. According to a first inspection and diagnosis in 1990, the original image carriers were in critical condition. The dusty glass plates exhibited a considerable amount of scratching and sticking, fracturing

(Togo, Cameroon, German South West Africa and German East Africa), the Chinese concession Kiaochow, Kaiser-Wilhelmsland (German New Guinea) and the South Sea areas are also represented. There are also many thousand images of the colonies of other states in Africa and Asia.

During the conservation work, an increasing level of awareness of the Frankfurt archive among domestic and foreign cooperation projects led to an exchange of image material and to offers to provide more images to the archive. By far the greatest gain was achieved, with the support of the Deutsche Forschungsgemeinschaft (German Research Foundation), through a cooperation with the Sam Cohen Library in the Namibian coastal town of Swakopmund. The Society for Scientific Development located there provided a substantial image collection for the expansion of the Colonial Picture Archive. It includes 5,000 slides and glass plates

In 1990, when two doctoral students from Frankfurt, Imre Demhard und Uwe U. Jäschke, were searching for historical material about the former German South-West Africa, they uncovered a treasure trove: the well-nigh forgotten image archive of the Reich Colonial Society, which was dissolved during the Second World War. This collection of 55,000 historical photos is a first-class, multi-faceted source for colonial history. Following the description, backup filming and digitalisation of the image documents, which was as costly as it was time consuming, the Colonial Picture Archive is now accessible on the website of the Johann Christian Senckenberg University Library in Frankfurt am Main to scientists and other interested parties from around the world.

The original owner of the image material, which also includes training material and roughly 18,000 books on colonial history,

as well as a further 10,000 images and postcards in lever arch files or historical photo albums. Along with landscapes and city views, missionary stations, streets, harbours and farms, there are pictures of everyday life, festivals and sport events and many portraits. It was quickly established that there was practically no overlapping with the existing Frankfurt material, so their incorporation in the archive represented a real scientific gain.

Based on the experiences acquired through the filming and digitalisation of the Colonial Picture Archive, it seemed an obvious step to make the German Colonial Encyclopaedia available on the Internet in digital form, and to offer it in conjunction with the image database. The German Colonial Encyclopaedia, which was edited by Heinrich Schnee, the former Director of the Reich Colonial Office, is a contemporary reference work of the German colonies. By the time the First World War broke out, most of it had been published in printed form. The digital publication of the encyclopaedia, accomplished by the University of Applied Sciences in Dresden, means that access to this unique historical and scientific source is no longer restricted to specialist institutions, and that it can now be utilised around the globe. The encyclopaedia shows the conditions in the colonies as reflected by contemporary views before 1914. It thereby provides an important information basis for research.

Today, extensions to the image material in the colonial image archive in Frankfurt do not always pursue scientific goals or result from deliberate acquisitions. Chance and everyday caprices often have a roll to play. In the autumn of 2005, for example, the Frankfurt Library was offered a photo collection that had lain for over sixty years in a cellar in Siegburg. It consisted of 150 photographs and postcards, which were brought from what was then German South West Africa in 1913. The photographs show the everyday life of a telegraph line worker,



Scenes from everyday life in the colonies. Left: A lesson under the open skies. Top right: In German East Africa (Tanzania), a team of oxen draws a heavily-loaden wagon through the water. Bottom left: Natives at a homestead in Togo. Bottom right: On 27 January 1912, German colonists unveil an equestrian statue in Windhoek (German South West).

who worked in the postal service in the German colony from 1905 to 1913. The amateur photographs not only illustrate the working life of the time, but also give fresh views of places, rivers and mountains that were only seemingly familiar. The accompanying texts compliment the pictures in a laconic telegraph style, providing a kind of a oral history without scientific pretensions. Their significance for science is only due to their permanent documentation in the context of the Colonial Picture Archive.

Notwithstanding the successful conservation of the historical image information and its online presentation, making it accessible to scientists worldwide, the work of the Colonial Picture Archive of the University Library of Frankfurt/Main has not yet reached an end. On the one hand, due to their intrinsic historical value, it is important that the original image carriers be permanently restored and preserved. On the other, the descriptions found in today's database, although mostly taken from the original captions on the pictures or picture sleeves, are to some extent incorrect and in every case incomplete. This calls for a systematic examination, in order that this unique historical source can be developed in sufficient detail for research.

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► [www.ub.bildarchiv-dkg.uni-frankfurt.de](http://www.ub.bildarchiv-dkg.uni-frankfurt.de)

# When Humanity Began to Settle Down

*Paths to the early history of humanity: At the Göbekli Tepe in Anatolia, archaeologists are uncovering unique Stone Age monuments. They are thereby contributing to a new understanding of settlement history and of incipient agriculture*

By Klaus Schmidt

About 15 kilometres north-east of the Turkish city of Sanliurfa, on a mountain ridge that can be seen for miles around, lies the Stone Age archaeological site Göbekli Tepe. Its enormous deposit layers, up to 15 metres high, have accumulated over several millennia on an area of about 9 hectares. Even today the place has lost nothing of its magical appeal. For example, a wishing tree, which stands on top of the ridge, is still sought by the inhabitants of the surrounding area.

On this site, archaeologists found an important piece of the puzzle represented by the early history of humanity, which contributes to a completely new understanding of the process of sedentism and the beginning of agriculture. Of course the hill, which is strewn with numberless stone implements, and with large-format, regular-shaped ashlar, only revealed its secret as a result of the excavations, which have been carried on since 1995.

Amazingly, no residential buildings have been discovered up to now. However, at least two phases

View of the Göbekli Tepe in the foreland of the Taurus Mountains in southeast Turkey. The roughly 300 square meter archaeological site lies on the highest point of an elongated mountain ridge. Nowadays, a wishing tree, which can be seen from miles around, stands on the top of the ridge and is still sought out by the inhabitants of the surrounding area.

of monumental religious architecture have been uncovered. Of these, the oldest layer, with its richly adorned monolithic pillars, is the most impressive. The buildings on this layer are circular, with a diameter of over 20 metres, and constructed from quarry stone. Their age is impressive, having been dated to the 10th millennium BC, a time when men still lived as hunter-gatherers. This opened up a layer of the Stone Age, in which the so-called Neolithic Revolution took place. The next oldest layer

has been dated to the 9th millennium. It has been demonstrated that some plants and animals were already used during this millennium, and that elaborate settlements had been built, such as Nevalı Çori, which lies 50 kilometres further north. The excavation there, which caused a sensation in the 1980s, opened a new window on a previously unsuspected world of Stone Age culture. The type of dwelling which was excavated in Nevalı Çori, with a living space in front and a rectangular area be-



Stone pillars in megalithic form are the most characteristic feature of the Göbekli Tepe site. These carry numerous animal reliefs that are still quite visible. Left: Distinctive T-shaped pillars with duck-like birds, cranes, snakes and rotated H signs. Next picture: A Stone Age pillar featuring a bull, a fox and a crane.

hind for storing provisions, may be considered the prototype of the Anatolian farm house that can still be found today. Even then, the houses were up to 6 metres wide and 18 metres long.

Nevalı Çori was submerged by floods from the Atatürk Dam Lake in 1992. Well preserved, although not yet completely researched, is the Karahan Tepe, which features hundreds of T-shaped pillars and is situated about 50 kilometres southeast of the Göbekli Tepe. Residential buildings like those in Nevalı Çori appear to be completely absent from Karahan. The same applies to the Sefer Tepe, located about 80 kilometres east of Göbekli Tepe. At this small, likewise unexplored site there are nu-



merous T pillars, but probably no residential buildings. The pattern is repeated at Göbekli Tepe: the settlement traces, including caverns, fire places and residential buildings, which are normally characteristic of Stone Age sites, are so far missing. Though the research results are still pending, it appears that there were different types of location: genuine settlements like Nevalı Çori and purely religious places such as Göbekli Tepe, Sefer Tepe or Karahan Tepe.

The stone pillars are the most characteristic feature of these archaeological sites. They only occur in monumental form at Göbekli Tepe. The pillars are without doubt abstract representations of people; they are, in other words, stone statues of anthropomorphic beings. Representations of arms and hands were discovered on the sides of several pillars in both Nevalı Çori and in Göbekli Tepe. The head is represented by the cross of the T-

Circular pillar construction at Göbekli Tepe. Right: Along with the stone pillars, full statues are also to be found – in this case, an over-life-sized human head: Up to now, no distinctly recognisable feminine motifs are depicted by the Stone Age artefacts, neither by the anthropomorphic nor the animal-like objects.



shaped pillars, with a longer face section facing the centre of the circular structure and a shorter back of the head, corresponding to the natural proportions of the human head. Differentiation of sex was evidently not intended. It is also clear that the minimalist form of representation was intentional, because the other statues and reliefs found at the site offer sufficient proof of the artist's ability to produce naturalist works. If anything, the stone pillars represents ancestors, ghosts of the dead or daemons, and have therefore been given an ambiguous form.

The stole that can be discerned on some pillars is possibly an attribute or a garment. It could only be worn by certain persons as a ritual robe. Perhaps the stone buttons which occur in large numbers only in Göbekli Tepe belong to a robe of this type.

The pairs of pillars in the centre of each space, which tower above the other pillars, must also be ascribed an important role. Twins, or pairs of brothers and sisters, are a common theme in mythology. On the other hand, they may simply

present the classic duality of man and woman. However, with one exception, the reliefs, adorning many of the 44 pillars discovered up to now, depict only animals. The only human portrait is presumed to be of a headless man. So far as can be seen, the gender of the animals is also male: foxes and boars, ducks and cranes, lions and wild asses, snakes, spiders and scorpions. Some of the animals, most of which could be said to have terrifying or protective aspects, may

have served as guards. It remains a mystery whether the relief pictures should be considered as attributes of the respective "pillar beings", or whether they

are part of a mythological cycle. The animal reliefs are naturalistic and correspond to the fauna of that time. However, the pictured animals need not necessarily have played a special role in the everyday lives of the people, as game animals for example. They were rather part of a mythological world, which we already encounter in cave painting. The important thing is that – with the exception of anthropomorphic beings



It is likely that the stone pillars at Göbekli Tepe symbolise ancestors, ghosts of the dead or even daemons.



Illustrations: Deutsches Archäologisches Institut Berlin

with animal heads – fabulous or mythical creatures, such as centaurs or the sphinx, winged bulls or horses, do not yet occur in the iconography and therefore in the mythology of prehistoric times. They must be recognised as creations of the high cultures which arose later.

In Göbekli Tepe, distinctly feminine motifs are lacking from both animal and human images. In Nevalı Çori, by contrast, among the terracottas that have nowhere else been found in such abundance – 700 in number – male and female figures are documented in equal shares. Over 90 percent of them are anthropomorphic objects. The complete absence of terracottas at Göbekli Tepe, in the more recent and in the older Stone Age layers, is most remarkable. This surely reflects the different functions of the ritual buildings at both locations: while the buildings of Göbekli Tepe have a possible connection with burial customs, at Nevalı Çori, it is possible to examine a village settlement and everyday life. The use of clay as a material for the male and female figures found

here is not insignificant. The smaller stone figures also discovered here exhibit a completely different and much richer iconographic repertoire, which repeats the stock of motifs associated with the large stone sculptures and reliefs.

It has been a great advantage to modern archaeology that the circular constructions of the older layer at Göbekli Tepe were completely filled in during the Stone Age. The old surfaces that can be observed in the excavations and the processes that occurred in the sediment have been subjected to pedological analyses and allow the act of filling to be dated. What is more, the circumstance that the structure was filled in leaves some room for interpretation: Was an old religion buried along with the constructions? Was the act of filling carried out repeatedly?

We can assume that much older traces and constructions are yet to be found at Göbekli Tepe, and it may be conjectured that the place has a history going back over several thousand years, as far as the Old Stone Age. The Göbekli Tepe

Current view of the excavation at Göbekli Tepe. The fact that some circular structures and building groups of the older layer were completely filled in during the Stone Age has been a great advantage to archaeological basic research. From future excavation campaigns, archaeologists hope to find even older traces of human and cultural history.

opens a new perspective on the Early Neolithic: specialisation on particular tasks must have been possible, in order for members of the community to be able to erect these monuments and to adorn them so elaborately. The people must also have had a highly complicated mythology, including a capacity for abstraction. Further investigations will certainly give us with more detailed information.

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By Axel Meyer

When I first went to Nicaragua as a young doctoral student from the University of California at Berkeley in 1984, the communist Commander Daniel Ortega was in power and civil war was raging between the Sandinistas and the Contras, who were backed by President Ronald Reagan. The strict US embargo inflicted even greater poverty on the country, its infrastructure was in tatters and there were no spare parts for cars. Even so, we had to find a way to cross the war zone between Costa Rica and Nicaragua, because there was no longer a direct bus connection into the country, but that's another story.

There were other foreigners in the war-torn country too, providing humanitarian aid, but I was there to catch fish for research purposes. Specifically, the reason I was there was the Midas cichlid, a species which stands out due to its unusual appearance and interesting colouration. In most populations, about 90 percent of the fish have black and white stripes, with about 10 percent losing the black colour once they reach a length of about 10 centimetres, becoming bright yellow. It is to this feature that they owe their name, being a reference to King Midas in Greek mythology, as everything he touched turned to gold.

The American zoologist and ecologist George Barlow (1929–2007) had been studying the mating and aggressive behaviour of this species (*Cichlasoma*, now known as *Amphilophus citrinellus*) with a number of doctoral students, since the mid-1970s. Golden and "normal" black and white females prefer to breed with males of the same colouration, and golden cichlids have an advantage during aggressive territorial rivalry as well as during mating rituals. The main emphasis was placed on their behavioural biology; for example, looking at the issue of whether young fish learn this preference for fish of the same colour from their par-



## King Midas and His Descendants

*Cichlidae is the most diverse family of all fish and vertebrates. Some of the 3000 or more species are found in the crater lakes of Nicaragua, and they throw a remarkable light on the processes of evolution*



ents or siblings, or whether it is an inborn trait. However, George Barlow's interest was not in the evolutionary consequences of this partner choice, and my main interest, as a doctoral student of his from Berkeley, was in gaining a better understanding of the emergence of new species.

Initially, I hadn't actually wanted to study this species. After all, what could there be left to discover where a dozen doctoral students had already been? But then I noticed that the individual members of this species not only differed significantly in colour, but also in terms of other morphological structures. There were significant variations in body shape within the population of any single lake, with particularly marked differences in the shape of the jaw. Cichlids have developed the fifth branchial arch, which in more basal fish still supports gills for breathing, into a "second jaw", known as the pharyngeal jaw, which enables them to process sources of food that remain inaccessible to other fish.

This evolutionary innovation probably contributed towards making the Cichlidae the most diverse family of all fish and vertebrates – with over 3000 species. The Midas cichlid is able to grow very strong "molariform" pharyngeal jaws, which have very strong molar-like teeth that enable it to break hard snail shells, or "papilliform" jaws with small, sharp teeth, with which it can efficiently macerate soft food such as insect larvae. The papilliform Midas cichlids are unable to break snails' shells, however. It seems feasible to propose that this variety of forms associated with feeding may be the decisive

Waiting for the big catch: Two fishermen hunting down Midas cichlids with a cast-net. These fish are very varied in colour and shape. From left: *Amphilophus citrinellus*, *Amphilophus labiatus* with its characteristic bulbose lips and the more recently discovered *Amphilophus zaliosus*, also known as the Arrow cichlid.

factor in the emergence of new species through ecological speciation.

Cichlids in one population that not only find different sources of food at different locations in a lake, but also select their breeding partners according to their shape or colouration, could thus potentially evolve into new species. Interestingly, this appears to be possible within a single lake, even in very small crater lakes, of which there are several in Nicaragua, because, as we now know, each of the crater lakes contains its own set of young species.

The cichlids are thus, alongside the Darwin's finches from the Galapagos Islands, among the best known model organisms for speciation research in evolutionary biology. They present an opportunity to study not only sexual selection, in other words, the emergence of new species through selective breeding, but also to test theories of "ecological" species formation.

**D**arwin's idea, that natural selection amongst the individuals of a population may not only lead to better adaptation within a species, but could also lead to the emergence of new species, had increasingly faded into insignificance since the late 1930s and 1940s. This was because the architects of the so-called "modern synthesis", which combined the findings of various branches of evolutionary biology to form a coherent theoretical framework, focused on geographical conditions as the key mechanism, leading to new species more or less as a by-product of geographical separation. Natural selection thus increasingly came to be seen as the key driving force on the path towards better adaptation within a population, but not as the mechanism for speciation.

During his career, the famous evolutionary biologist Ernst Mayr (1904–2005) was, for many decades, one of the most dogmatic and influential proponents of this process of "allopatric speciation".

16 According to this theory, also



known as geographic speciation, populations that are physically isolated for many generations accumulate so many genetic mutations that, if the geographical boundary ceases to exist, individuals of the populations are no longer able to interbreed. In other words, when speciation occurs allopatrically, it occurs, solely as a by-product of geographical isolation – and not as a result of natural selection. However, mating choices, and thus breeding barriers, are the key factor from the point of view of the biological species concept. According to this definition of species, only members of the same species are able to breed with each other. As a result, since the rise of the modern synthesis, the emergence of new species has been seen almost exclusively as a non-adaptation oriented and non-selective evolutionary process, with natural selection taking a subordinate role. For decades, not least due to Mayr's influence, this model was perceived as the dominant mechanism by which new species come into being. On the other hand, sympatric speciation, in other words, the emergence of new species from a single population due to ecological selection, was seen as an impossible or highly unlikely mechanism for the emergence of new species.

This perception of the emergence of new species has changed in the past decade, in terms of the geographical aspect and with regard to the role played by natural selection. Recent theoretical models have shown that, under certain circumstances, ecological specialisation can indeed result in new species within a single population, if there is sufficient selection – even without geographical barriers to prevent the movement of genes. This type of selection works against average individuals and in favour of extreme specialists – in the case of the Midas cichlid, for example, those individuals with particularly molariform or papilliform jaws, or those with especially long bodies, which are able to move effi-



Left: Cichlids being caught with a gill net for research purposes. In Lake Apoyo, a crater lake which is 200 metres deep and only 5 kilometres in diameter, evolutionary biologists have discovered a previously unknown species of cichlid. Above: In Western Nicaragua small crater lakes provide a very special habitat for various species of flora and fauna. Right: Looking out over Lake Apoyo, which has neither tributaries nor outlets.

ciently in open water, or others whose body shape enables them to manoeuvre particularly well close to the shore.

The Midas cichlid species complex has given us one of the few examples (to date) of the emergence of new species without geographical barriers, and thus of sympatric speciation. *Amphilophus citrinellus* only exists in the two large Nicaraguan lakes, Lake Nicaragua and Lake Managua, together with its close relative, *Amphilophus labiatus*. The types of Midas cichlid living in the crater lakes of Nicaragua, however, differ significantly from the populations in the large Nicaraguan lakes, both in terms of outer appearance and genetically.

So far only one other type, *Amphilophus zaliosus*, known as the

Arrow cichlid due to its shape, has been described. This species can only be found in the Apoyo Crater Lake, which is just 5 kilometres in diameter and completely isolated from other lakes and rivers. We have studied its origin in greater detail in recent years using genetic, morphological and ecological methods. It turned out that the Arrow cichlid not only differs from the original species of Midas cichlid, which it shares the lake with, in terms of appearance, but also that it probably came into existence in this lake less than 20,000 years ago. It only breeds with other members of its own species, which has also been demonstrated by experiments into partner selection in aquaria, and it relies on other sources of food and more often lives at greater depths than the original species.

**B**oth of the species that are known so far – more new species will be described in the near future – can be clearly distinguished from each other using genetic markers and modern methods of population genetic analysis. According to these findings, at least one new species has come into being through

ecological speciation in a small and young crater lake. In order to understand how new species emerge at a molecular level, we are now seeking to identify the genes which control the morphological and ecological differences between these young species. This also involves identifying how many genes are involved in the process and which types of mutation caused the differences between these species.

This is no trivial problem, and it will take many more talented doctoral students to reach an understanding of this fundamental issue of evolutionary biology. Nevertheless, we already know a lot about the unusual fish of this stunningly beautiful country, where the people are so friendly and where Daniel Ortega is President once again, 23 years after my first visit to Nicaragua – and this time democratically elected.

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Illustration: SRG Berlin

## “Talking About My Generation”

*The Senior Research Group in Berlin tests household appliances and high-tech gadgets to promote the development of products better suited to the needs of the 55-plus generation*

By Rembert Unterstell

At last! The mobile phone's arrived! It's silver, average in size and handy. Soon it is being passed from hand to hand. A photographer from a Berlin newspaper is present to witness the event, as the elderly group weigh up the benefits of the new device that will soon be going on sale at a chain of low-cost supermarkets throughout Germany.

But it fails to meet all the expectations they have of a “senior-friendly” mobile phone. “There are still several issues we would have liked to have seen addressed,” Klaus Wuttig says energetically. “We would like to have been involved and to have contributed our know-how at every stage of its development,” the 69-year-old re-

tired engineer says, with a mixture of resoluteness and Berlin nonchalance. Wuttig is a member of the Senior Research Group (SRG) at the Technical University of Berlin. This research group has about 20 members, from the mid-fifties to the mid-nineties, who evaluate ideas for new products, test the user-friendliness of household appliances and high-tech gadgets, and read and discuss instruction manuals. They also contribute the experiences they have had in using dishwashers, videos or CD players to studies. This group is backed up by a panel of about 150 senior citizens around Germany, who are on hand to take part in surveys or participate in tests.

The first Senior Research Group was founded in 2004, as a spin-off of SENTHA (“senior-friendly technology for household applications”), a

research group funded by the DFG. Whereas the participants in the SENTHA studies primarily served as study participants and test candidates, they later went on to become involved in the advisory board and now conduct research themselves, supported by researchers at the TU Berlin. “Collaborating with this group made for very stimulating science and proved very fruitful,” Professor Wolfgang Friesdorf, the ergonomist who led the SENTHA project, recalls, “and it motivated them to continue the study after the project ended, with their own ideas and setting their own priorities.” The group is now located in the Department of Ergonomics at the TU Berlin's Center of Human-Machine-Systems. By creating the Senior Research Group, they have accomplished something that is not only

Testing is teamwork: Members of the Senior Research Group take a closer look at a DVD recorder. Right: Klaus Wuttig making a phone call with a mobile phone that the Senior Research Group was involved in developing, although it failed to meet all the expectations they have of a senior-friendly mobile phone. Bottom: A design that appeals not only to elders: an oval, bent shirt button that can be done up, even with an unsteady hand.

unusual, but also truly remarkable: They have taken the initiative, acting as experts in their own field to promote new studies. Their self-confident slogan is “seniors researching for seniors.” Their research is still in its early stages, but the growing importance of technology that caters for the needs of older people has been apparent for some time now.

Germany is rapidly heading towards becoming an old-age society. Demographic change appears inevitable: According to data recently published by the Federal Statistical Office, almost half of the entire German population will be above the age of 50 by 2035. The “age pyramid” about which demographers have spoken up to now, will then bear more resemblance to a mushroom. This also means that older people, in particular the over-65s, are set to become the most important group

of consumers. At the same time, experts like Professor Friesdorf have already observed that, in contrast to previous generations, the emerging older generation defines itself more in terms of lifestyle than age. “This generation doesn't feel old,” he explains. The Senior Research Group in Berlin is a good example of this phenomenon.

The “senior experts” see their work as being on behalf of the growing “55-plus generation”. Testing and evaluating technological appliances and equipment with an older person's eyes, hands and ears is a key part of this. The group does not want to be just a miniature version of Stiftung Warentest, the German consumer organisation, however, because they are not primarily interested in comparing appliances to identify which are good and which are bad. Rather, they want to identify the actual obstacles that hinder use. The “senior researchers” are in any case absolutely convinced of the added value of senior-friendly products. “A new product that is genuinely user friendly for older people is bound to be user friendly for younger people too,” Ellen Gorisch, one of the founding members of the SRG, points out emphatically. “That means that every generation stands to benefit.”

There was therefore great indignation when the first “senior-



Illustration: Unterstell

friendly mobile phone” (the Vita-phone Handy) was released onto the market in 2004. It had just three oversize buttons, one green, one blue and one red, with the red one programmed to call an emergency number. There was no display and the clunky design made it predestined to remain in the realm of medical supplies. “To call that a senior-friendly mobile is patronising and ageist,” said Ellen Gorisch, still rankled. “The emergency phone may be useful for people who are incapacitated and rely on help, but not for most active senior citizens,” adds Wolfgang Friesdorf, in a rather more down-to-earth tone.

The experts in the SRG found that it is primarily the user interface of mobile phones and other high-tech gadgets that makes life difficult. They say that older people are often not used to operating a device via a menu that has dozens of icons and several levels. This is accompanied by the fear of breaking something, for example, by changing the default settings of a device. “This means that a lot of people just shy away from using a mobile phone entirely, which is a crying shame,” concludes Klaus Wuttig.



Illustration: sentha-Projekt



A magnifier on a shelf (left) and a seat built into a shopping trolley (below) are intended to make it easier for older people to visit supermarkets on their own. In Berlin-Friedrichshain a major supermarket chain has opened its first "generation market" in anticipation of the aging society of the future.

studies have come to was that, in contrast to a commonly held misconception, seniors are indeed very interested in new technological developments and are very eager to accept new technology. Interest only lessens amongst the very old.

This new concept of the older generation and the change in perspective it called for was decisive for the approach taken by the SENTHA groups. "Whereas we initially assumed that we would need to analyse the problems that the older people participating in our tests have in using technology," recalls Wolfgang Friesdorf, "we now refer to the resources that they have, because, after all, healthy elderly people have full sensory and motor skills." According to Wolfgang Friesdorf, senior-friendly technology is technology that "uses all of the resources an older person still has, while simultaneously taking into account their gradual loss of ability, for instance, in terms of sight, hearing or the sense of touch."

This new point of view can be very fruitful – even when designing products for everyday use. However, the design also needs to be appropriate to the environment of today's older generation, he emphasises. "It has to be functional and attractive." With the help of the Senior Research Group, designers have developed shopping bags on wheels, smart shoes that you can slip on without needing to bend over, and shirt buttons that not only look good, but, thanks to their oval shape, can even be done up with an unsteady hand. In another project, dubbed "newspapers for the ears," newspaper articles were augmented by a barcode, so that users could listen to them being read out via mobile phone.

These are just a few examples of innovative products for the "greying" society of tomorrow. If the

findings of the research conducted to date and planned for the future do manage to help senior-friendly products get off the ground, the range of such products on the market will be altered permanently, and the consumer environment changed beyond recognition.

In Berlin-Friedrichshain you can already catch a glimpse of what the supermarket of the future might be like. Not far from Berlin Ostbahnhof, a major supermarket chain has opened its first branch that offers specific amenities to cater for the needs of the older generation. Each shopping trolley is fitted with a magnifying glass to help the visually impaired see goods and prices better, and between the shelves there are wide, non-slip aisles, and even a step in front of the chiller cabinets to make it easier to reach items that are high up. There are even shopping trolleys with seats, to allow shoppers to take a rest while they are shopping! This pilot project, known as the "generation market" is the first of its kind in Germany, and the owner hopes it will catch on quickly.

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Illustrations: Unterstell

# A Balancing Act

*How the physicist and two-time mother Elisa Resconi combines science and family*

By Magdalena Schaeffer

Work and family are intricately linked in the life of Elisa Resconi. "Basically, I make no distinction between the two," said the young scientist. "Sometimes I leave work early, to see my children, and sometimes I work from at home. I could not imagine postponing one of these aspects of my life."

Work, for her, means her research activities at the Max Planck Institute for Nuclear Physics in Heidelberg, where the Italian citizen leads an Emmy Noether independent junior research group. Her family is composed of her two children, Emil and Emma, who are seven and four years old, and her husband Stefan Schönert, also a post-doctoral astrophysicist working at the same institute.

To balance both elements, for Resconi, "goes without saying". When she first came here from Italy, she was surprised to find that in Germany this point of view was not necessarily shared by others. "I had supposed that the German's were more advanced than the Italians with regard to many social issues. But, as far as working mothers are concerned, Germany seems to be a generation behind," said the 35-year-old.

Of course, for her too, the balancing act between work and family is not easy, and without help from others it would be a lot harder. Resconi and her husband have pursued their scientific careers in alternate "surges"; for example, while she applied for the Emmy Noether fellowship, he looked after the family. Sympathetic super-

visors were of equal importance. Then there was the Marie Curie fellowship from the European Commission and funding from the Emmy Noether Programme, which allowed them to arrange their life more flexibly, in terms of time and space. She was able, for instance, to move to Heidelberg with her family, while still working as a post-doctorate for the German Electron Synchrotron (DESY) in Zeuthen near Berlin. Her three colleagues in the working group in Heidelberg are accustomed to the fact that Resconi often leaves the office in the afternoon.

Resconi had very early contact with physics: her father, a teacher and later a professor of physics, used to involve the family in his scientific deliberations. "My mother and sister were not interested, and I too initially wanted to break away and study medicine, but I had already caught the physics bug." So she registered for physics in Milan, and then worked on her doctoral dissertation on experimental astrophysics at the world's largest underground research facility for particle physics and nuclear astrophysics, the Laboratori Nazionali del Gran Sasso.

With her Emmy Noether independent junior research group, Resconi has been participating since 2005 in the international IceCube project at the South Pole. The signals of neutrinos are intercepted there, in order to discover more about the fundamental mechanisms of the cosmos. In this context, the physicist is trying to find out what forms of particle acceleration exist, that are not generated by heat. "Neutrinos are



Illustration: private

like messages from space; our task is to encrypt them," she explains. To measure the energy of these frantically rapid particles, which travel at light speed through solid materials, is not easy. Researchers have found the perfect laboratory for this purpose in the three-kilometre-thick Antarctic ice. Measurements are taken in bore holes that are more than two kilometres deep.

Needless to say, Elisa Resconi need not be present in person – she gets the measurement data sent to her PC in Heidelberg.

She enjoys talking about her research field, and especially with laypersons. This is shown not only by the lively style of her explanations, but by the fact that she has even presented her work at her son's primary school. The highlight was when one of her colleagues called from the South Pole, and they both talked with the children about the Antarctic, cosmic radiation and global warming. Here too, the mother and researcher managed to integrate her family and her job.

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# The Secrets of the "Glass Mountain"

*Glasses occur even where they are least expected – in nature. The study of their mechanisms of formation and their characteristics is of considerable importance for the creation of new materials and for technical applications*

By Klaus Heide

Glass mountains have filled the fantasies of peoples everywhere. In fairy tales, the challenge associated with overcoming glass obstacles that are apparently indestructible is a recurring theme. This attribution of durability and permanence contradicts how glass and its characteristics are generally perceived in daily life. Glass, with its sometimes fascinating colours and shapes, is considered to be fragile and not very long lasting; the "glassy state" is often equated to "short lived".

This common perception of an unstable, glassy (or vitreous) state stands in notable contrast to a modern technology which promises to be able to banish the hazards of toxic hazardous wastes. The operators of nuclear power plants see the "vitrification" of radioactive waste as a solution for the "permanent disposal" of hazardous products resulting from decay. This highly controversial issue is not the only reason why we require a precise knowledge of the characteristics of glass.

There are two core questions in the foreground here: Does glass, with its dissolved materials and their chemical and physical reactions, possess the stability necessary for securing toxic materials for a time span extending more than a thousand years? And how does glass react with its natural environment during geologic and geophysical processes? While the first question is one primarily related to material sci-

ences, the second one is a question for the geosciences. The solution to this problem may be found in the results of the geoscientifically oriented studies which have been performed in recent years at the Institute for Geosciences at the University of Jena in cooperation with Armenian and Turkish collaborators.

With the aid of numerous laboratory experiments, it is now possible to determine the durability of technically produced glasses. These experiments are able to make predictions on the order of years. Longer periods, i.e., periods extending between a hundred and a thousand years, can be deduced in some cases from archaeological findings. These periods are not, however, sufficient for the requirements associated with the permanent disposal of hazardous wastes. For a reliable assessment of the durability of vitrified wastes, a geologic time scale of more than a thousand years is necessary.

A study of glasses formed prehistorically in nature is ideal for addressing this issue. Here, it is seen that "glass mountains" are much more than just fairy-tale fantasies. In some areas, they can be climbed and studied in greater detail: For example, the glass cliffs in the Triebisch valley near Meißen in Saxony, Germany, are of interest not only as a geomorphologic for-

mation. The material which makes up these cliffs, so-called pitchstone, is still a glass in spite of its old age of at least 300 million years. It has clearly withstood the changing climatic conditions in this region better than the surrounding crystalline rock over the past 10,000 years.

Only a weathering crust of just a few millimetres covers the green, black, or red-brown bitumen-like, shiny glass. This glass, which was formed by volcanic activities during the Carboniferous period (beginning 360 million years ago), differs from other natural glasses, the obsidians, particularly in regard to water content. While

pitchstones may be up to 10 percent water by mass, the water content of obsidians is usually less than one percent. Obsidians vary widely in age. Some are more than several million years old. There are immense deposits of obsidians as well, some of which take on fairy-tale-like dimensions, for example those found in the landscapes of Armenia, Turkey or Italy. Based on their external condition, they are just as "fresh" as newly produced technical glass.

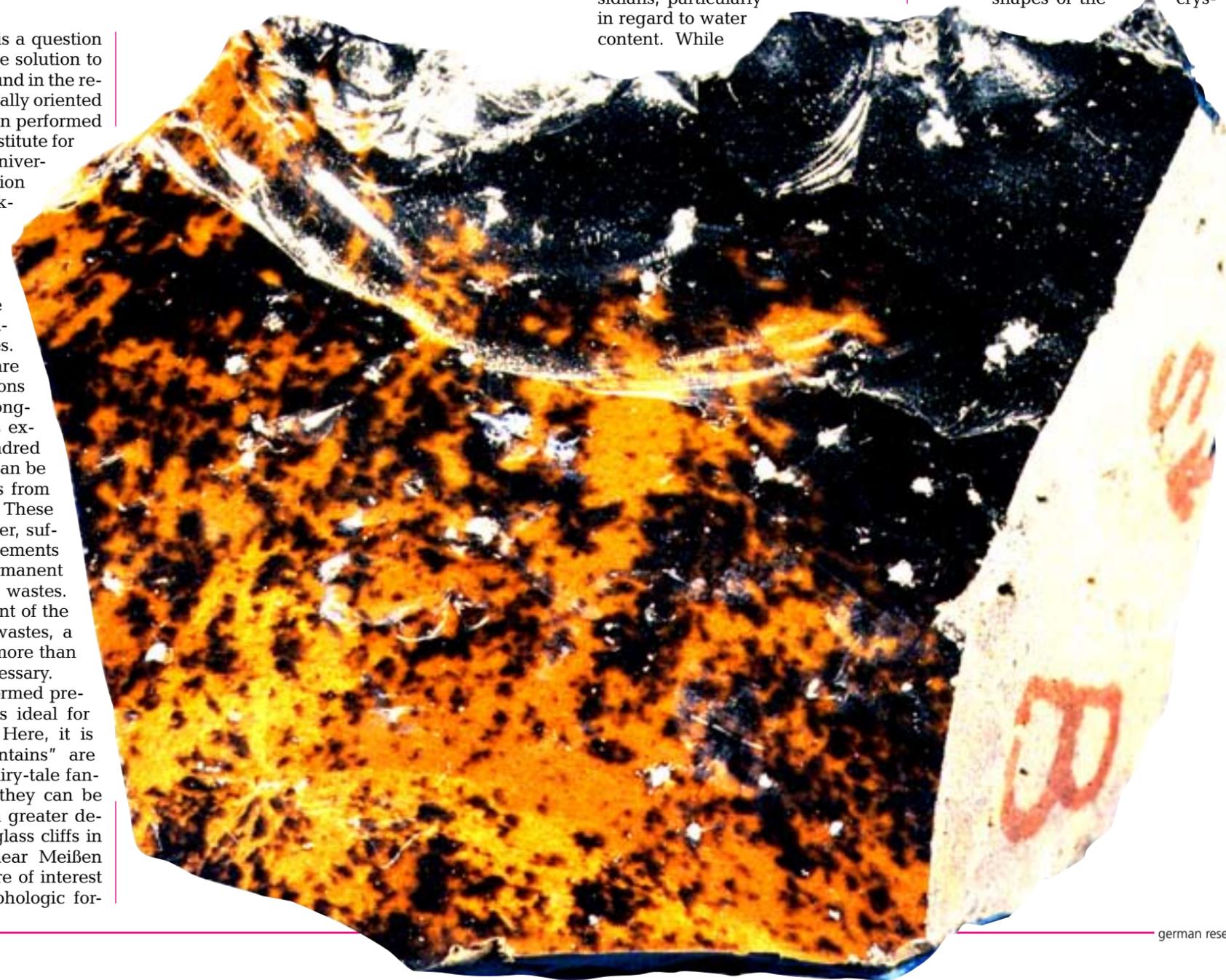
Their characteristics are determined by various crystals in a glassy structure. Like letters in a book, the shapes of the crystals

provide information on the history of formation. Thus, they provide an important source of information. As a whole, they form the "words" of a "text", which is far from being deciphered.

The physical and chemical properties of these glasses are of interest. The transformation of obsidians into a molten mass occurs at temperatures considerably higher than for most technical glasses. For window glass, this transformation occurs at approximately 560 degrees Celsius. For an obsidian from the island of Lipari, north of Sicily, this transformation occurs at a temperature in excess of 700 degrees Celsius; for obsidian created by the Armenian volcano of Arteni, the value is 830 degrees Celsius. Thus, the values vary widely.

The glass structure determines the glass transformation process. The networking of the individual units of structure affects the flow behaviour of the glass-forming melting process in different ways. The higher and larger the transformation range (in the words of the glass maker: the "longer" the glass), the "tougher" the glass is at comparable temperatures. The glass maker utilises this fact during processing by varying the chemical composition and, at the same time, by taking advantage of the flow characteristics of the natural, glass-forming melting process. Technical glasses are generally formed from just a few base components – window glass, for example, contains sand, sodium carbonate and lime. Depending on the technical application, the properties are varied further through additives such as potassium, aluminium, boron or fluorine. Obsidians and pitchstones, on the other hand, are oxidic, multi-component glasses.

Glasses with a similar chemical composition, which can be found in countless individual pieces on the

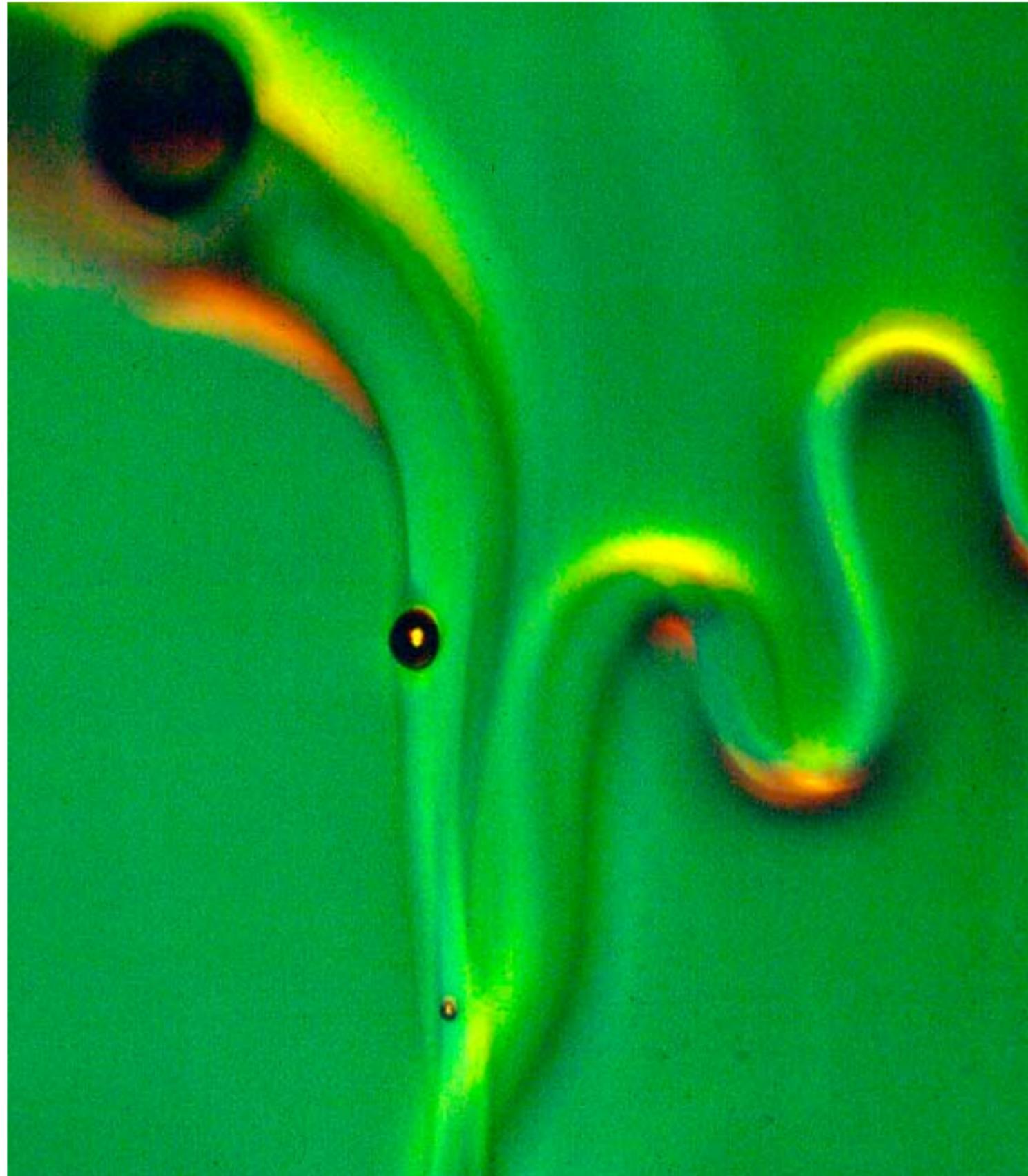


A volcanic glass, known as obsidian, from the Sirikli Tepe in Turkey. The crystal inclusions in the glassy structure provide detailed information on the history of its formation.

surface of the earth, tell a completely different story. They were apparently formed very rapidly at various locations on the surface of the earth, for example in North America approximately 36 million years ago, in the Czech Republic 14 million years ago, on the Ivory Coast one million years ago or in the Australia-Indochina region 900,000 years ago. All of these glasses, so-called tektites, are likewise in surprisingly good condition in spite of their old age. Unlike the volcanic glasses, these contain practically no crystals, but many streaks and bubbles.

They have extremely low water content, i.e., they contain considerably less water than obsidians or pitchstones, and also less than technically produced container or window glasses. These glasses appear to be the result of a collision between a cosmic body and planet Earth. During such events, parts of the earth's crust were vaporised and melted in a very short time. The melted droplets then cooled quickly as they fell back to the earth's surface.

Decisive for glass formation on the earth's surface are the chemical composition and the formation process. Unlike technically produced glasses, the natural glasses of the "glass mountains" and the tektites contain considerably more aluminium (approximately 10 percent compared to the 3 percent by mass in standard technical glasses). Glasses with the same composition as obsidians, pitchstones or tektites can only be synthesised in the laboratory at temperatures exceeding 1700 degrees Celsius. This process has been carried out at temperatures which have never been observed in nature during volcanic processes. Under the microscope, it can be seen that the flowability of the natural melting must have been very high. In order to lower the viscosity of such molten masses on the earth's surface, temperatures considerably above 1700 degrees Celsius or appropriate additives are necessary. From these and other observations, it can be deduced that the vitrification of waste materials in obsidian-like glasses produced with conventional technologi-



A natural composition: Streaks and bubbles create features in a light-green moldavite glass from the Czech Republic. Glasses such as this were formed by the impact of meteorites on the earth's surface. Top: An obsidian quarry in Armenia.

cal methods does not represent a viable solution.

Taking into consideration the massive deposits in many regions of the earth, the question arises as to a useful application of this valuable resource. Numerous tools and objects demonstrate that these materials have played an important role in the cultural history of the human race. In the context of the protection of the human race and its environment from the consequences of technological developments, such as nuclear power, it remains a challenge to study the characteristics and conditions under which these natural glasses formed in order to develop intelligent solutions for their technical use.

One finding of the studies to date is that in order to make compact materials out of natural glass, more than just high temperatures are necessary. For example, parts of the glass masses clearly consist of re-fused glass fragments, which form massive blocks. Only vague ideas

exist with regard to the conditions necessary for the formation of such densely fused glass fragments. From the shape of the fragments, it can be deduced that these were not heated for long periods of time above the glass transformation temperature. The development of a technology for fusing such fragments, possibly directly including the hazardous materials as a fluxing agent, could make obsidian an interesting raw material for sustainable environmental protection.

The "permanent disposal" of such blocks with the permanently integrated hazardous materials in "glass mountains" represents an environmentally friendly option for the future. Last but not least, for economically disadvantaged countries with large potential for radioactive waste, such as Armenia, this may open new perspectives for the solution of current disposal problems as well for the use of suitable raw materials for global environmental protection.

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## Where Science Builds Bridges

*Excavation site Wiskiauten: A team of Russian and German archaeologists dig near Kaliningrad in former East Prussia*

By Eva-Maria Streier

The sky above our heads was dry, even sunny, on this late August afternoon. Down below, however, in a four-metres-deep well, Timo Ibsen, lead archaeologist of the dig at Wiskiauten, had to contend with a relentless flood of water. Covered in mud from head to toe, he and his team were trying to excavate the stone well as best they could, using a pump that was hopelessly out of its depth and by passing buckets from hand to hand, in an effort to recover a lump of charcoal – an important artefact for dating the well.

We are not far from the Samland coast in the Russian enclave of Kaliningrad, in what was once East Prussia. Three kilometres south of the coastal resort of Selenogradsk, which up until 1945 was called Cranz, the archaeologists suspect there once lay the major Viking trading centre of Wiskiauten.

The Viking cemetery of Wiskiauten, which has over 500 burial mounds, was discovered in 1865 and has occupied several generations of archaeologists ever since. German archaeologists were the first to dig at the site, and by the beginning of the Second World War had excavated about 300 graves, recovering a wealth of weapons, remains of costumes and items of jewellery. The finds, which were unmistakably of Scandinavian design, were taken to the world-famous Prussia Museum in Königsberg Castle for safe keeping. Not long before the end of the war, the collection was evacuated and hidden in various locations in Königsberg and elsewhere. As a result, many items were deemed lost after the war. It was not until 60 years later that parts of the collection, including material from Wiskiauten, were rediscovered. When the Russians resumed excavation of the cemetery after the war more finds of Scandinavian origin were discovered.

It was only logical to assume that the cemetery had once belonged to a nearby trading settlement, which must have been linked to the trade network in the Baltic area that existed during Viking times and was based primarily on the locally plentiful amber.

Since 2005, a joint Russian-German research project has been attempting to locate this settlement. The project is being led by Professor Claus von Carnap-Bornheim, Director of the archaeological museum in Schleswig, and Professor Nikolaj Makarov, President of the Institute of Archaeology of the Russian Academy of Sciences in Moscow. The DFG has been supporting the research project since the beginning of 2007, providing considerable funding for staff and consumables. This is the first major German-Russian archaeological project in former East Prussia, after many decades during which this region was inaccessible to scientists.

Ample justification, therefore, to send a delegation from the DFG to get an idea of the situation there and to build up contacts between the German and Russian archaeologists. The group therefore included not only the DFG's Programme Director responsible for archaeology,

Dr. Hans-Dieter Bienert, and his colleagues from the International Affairs Division, Dr. Jörg Schneider, and Dr. Jörn Achterberg, but also the Director of the Museum for Pre- and Early History in Berlin, Professor Wilfried Menghin, as well as Professor Karl-Heinz Willroth from the Seminar for Prehistory at the University of Göttingen and Professor Nikolaj Makarov from Moscow.

There they were joined by Professor Wladimir Kulakov, perhaps the best expert on the region of Kaliningrad, which is rich in archaeological treasures. Undaunted by the conditions, he sleeps in a tent just like his students when they are working at the cemetery of Wiskiauten, even though he is nearly 60.

During the discussions and field visits over the three days they spent there, the members of the delegation were able to agree on more projects for continued cooperation in the future – yet more proof of the increased trust that the Russian researchers now have in their German colleagues. For instance, in 2008 they are planning a workshop for German and Russian archaeologists, and travel grants will be provided to researchers from both countries.

Since 2005, an extensive geomagnetic survey has been conducted in Wiskiauten, with German backing. This has uncovered thousands of anomalies in the direct vicinity of the cemetery and its burial mounds. Approximately 70 hectares of a total area of two square kilometres have



Graphic: Herling



Illustration: Schneider

been scanned so far, but, as Timo Ibsen says, "we are proceeding with surgical care, just taking small steps at a time."

The stone well is one of their most important finds and dates back – as confirmed by the charcoal that they eventually recovered – to the 11th century.

One of the greatest threats to the excavations are grave robbers, who hope to sell the treasures on the black market. This is another reason why the Russian researchers are grateful for the support from their German colleagues – as well as for the interest shown by the general public. So it was very appropriate that, at the same time as the DFG delegation was visiting the area, a TV crew was also in Wiskiauten, filming an episode of the well-known documentary Schlie-

manns Erben (Schliemann's Legacy) for the German broadcaster ZDF.

This area's special history and political situation is deeply moving for all those present. The tradition and culture of Königsberg, which was not only hermetically sealed-off from the rest of the world for several decades, but was more or less obliterated, is gradually re-emerging. Wedding couples are once again making the trip to Immanuel Kant's tomb to have their wedding photos taken, there are plans to rebuild the castle and renovate the cathedral. The German Consul General in Kaliningrad, Dr. Guido Herz, even considers the 750-year history of the city history to be the key element that connects and forges a sense of identity in the people who were forced to resettle to the Kaliningrad region.

In spite of the fact that numerous churches were plundered for building materials and are now in a sorry state of disrepair, that some of the fields have been left unfarmed for decades, and that the view from the Curonian Spit to the Baltic or the Curonian lagoon still gives the impression of a restricted military zone, as there is not a ship to be seen far and wide; in spite of all this, no visitor can escape the natural beauty of

If you want to be an archaeologist, you have to get involved. German and Russian students pass heavy buckets of water from hand to hand. Lead archaeologist of the dig, Timo Ibsen, trying to excavate a Viking well.

Many churches around Kaliningrad were plundered for building materials. With the roof missing, weeds thrive inside as well as out. Now that people have started to take interest in the past again, restoration work has begun.

this landscape. Many wealthy Russians have also recognised this fact and are investing in the "special economic zone" that was established in Kaliningrad, building houses and even encouraging gentle tourism. With Lithuania to the north, Poland to the south, Belarus to the east, and the Baltic to the west, the Kaliningrad oblast remains an enclave, although it is gradually opening up. You can get a feel of what it must once have been like at the railway station in Kaliningrad, when the long-distance train to Berlin, which consists of just three carriages and takes 13 hours for its 600 kilometre journey, is sent on its way, with music blaring from the loud speakers – a moving scene!

In spite of the great tragedies of recent history, the scenario with the young Russians and Germans at the well shaft excavation, passing the heavy buckets of water down the line, points the way to the future. Eight Germans and six Russian students spent six weeks at the dig house this summer, living, working, partying and surviving the mosquito attacks together – and science once again proved its ability to build bridges.

Dr. Eva-Maria Streier is Head of the DFG's Press and Public Relations Office.



Illustration: Schneider



Illustration: Bienert

## The Deutsche Forschungsgemeinschaft

The DFG (German Research Foundation) is the central self-governing organisation responsible for promoting research in Germany. According to its statutes, the DFG serves all branches of science and the humanities. The DFG supports and coordinates research projects in all scientific disciplines, in particular in the areas of basic and applied research. Particular attention is paid to promoting young researchers. Researchers who work at a university or research institution in Germany are eligible to apply for DFG funding. Proposals will be peer reviewed. The final assessment will be carried out by review boards, the members of which are elected by researchers in Germany in their individual subject areas every four years.

The DFG distinguishes between the following programmes for research funding: In the *Individual Grants Programme*, any researcher can apply for financial assistance for an individual research project. *Priority Programmes* allow researchers from various research institutions and laboratories to cooperate within the framework of a set topic or project for a defined period of time, each working at his/her respective research institution. A *Research Unit* is a longer-term collaboration between several researchers who generally work together on a research topic at a single location. In *Central Research Facilities* there is a particular concentration of personnel and equipment that is required to provide scientific and technical services.

*Collaborative Research Centres* are long-term university research centres in which scientists and academics pursue ambitious joint interdisciplinary research undertakings. They are generally established for a period of twelve years. In addition to the classic Collaborative Research Centres, which are concentrated at one location and open to all subject areas, the DFG also offers several programme variations. *Transregional Collaborative Research Centres* allow various locations to cooperate on one topical focus. *Cultural Studies Research Centres* are designed

to support the transition in the humanities to an integrated cultural studies paradigm. *Transfer Units* serve to transfer the findings of basic research produced by Collaborative Research Centres into the realm of practical application by promoting cooperation between research institutes and users.

*DFG Research Centres* are an important strategic funding instrument. They con-



Illustration: Querbach

centrate scientific research competence in particularly innovative fields and create temporary, internationally visible research priorities at research universities.

*Research Training Groups* are university training programmes established for a specific time period to support young researchers by actively involving them in research work. This focuses on a coherent, topically defined, research and study programme. Research Training Groups are designed to promote the early independence of doctoral students and intensify international exchange. They are open to

international participants. In *International Research Training Groups*, a jointly structured doctoral programme is offered by German and foreign universities. Other funding opportunities for qualified young researchers are offered by the *Heisenberg Programme* and the *Emmy Noether Programme*.

The *Excellence Initiative* aims to promote top-level research and improve the quality of German universities and research institutions in the long term. Funding is provided for graduate schools, clusters of excellence and institutional strategies.

The DFG also funds and initiates measures to promote scientific libraries, equips computer centres with computing hardware, provides instrumentation for research purposes and conducts peer reviews on proposals for scientific instrumentation. On an international level, the DFG has assumed the role of Scientific Representative to international organisations, coordinates and funds the German contribution towards large-scale international research programmes, and supports international scientific relations.

Another important role of the DFG is to provide policy advice to parliaments and public authorities on scientific issues. A large number of expert commissions and committees provide the scientific background for the passing of new legislation, primarily in the areas of environmental protection and health care.

The legal status of the DFG is that of an association under private law. Its member organisations include research universities, major non-university research institutions, such as the Max Planck Society, the Fraunhofer Society and the Leibniz Association, the Academies of Sciences and Humanities and a number of scientific associations. In order to meet its responsibilities, the DFG receives funding from the German federal government and the federal states, as well as an annual contribution from the Donors' Association for the Promotion of Sciences and Humanities in Germany.

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Giving a hand with child care when things are difficult. If the childminder has to cancel or nursery is shut because an illness is going round, employees at the DFG Head Office can bring their children to work. Work and play can coexist in the "Parent and Child Room". The DFG has once again been certified as an exemplary employer by the "audit berufundfamilie®" for this and other family-friendly opportunities and working models.