Earth's Treasures

How we use and value mineral resources

12 April 2018 to 21 October 2018
a special exhibition
at the "Museum für Urgeschichte(n)" Zug

Topics of the Exhibition

01 – Mineral resources
Geological processes on and within the Earth determine the formation of mineral resources.

02 – Resources through history
Mineral resources have had a major impact on human history. How have they influenced the development of culture and technology?

03 – Switzerland's mineral resources
Rich in rocks! – Today, Switzerland's resources are relevant mainly in the area of building and industrial materials.

04 – Significance and use
Natural resources play an important role for the economy and our daily lives. We could have no electricity without copper, no plastic without petroleum and no steel without iron.

05 – Research on mineral resources
How does ETH Zurich's Department of Earth Sciences do research on processes of resource formation?

06 – Exploration and prospection
Geologists can use state-of-the-art methods to detect natural resource deposits (exploration) and investigate them before mining (prospection).

07 – Drill cores
Sampling the subsurface.

08 – Resource mining
Drilling, blasting, digging, pumping – how do we extract resources?

09 – The frontiers of mining
The growing demand for resources has led to the consideration of remote regions for mining that are difficult to access. These include areas that also require protection, such as the deep sea, the Arctic and space.

10 – Mining labour
What's it like to work in a mine?

11 – Land use
How do we use our land? Who decides how it is used? What does resource mining mean for a region and the people who live there?

12 – Mining and the environment
Mining requires a lot of energy and water. In addition, residuals and pollutants can contaminate the soil, water and air.

13 – Ecotoxicology
The accumulation of mercury and other heavy metals in the environment is a major problem: mercury can enter the food chain and end up on our plates.

14 – Processing of metals
How is mineral ore turned into pure metal? Let's take a step-by-step look at how ores are processed using the example of copper.

15 – Rare earth elements
Why are rare earth elements among the most sought-after resources in the world? Are they really as rare as their name implies?

16* – Experiments
How we use mineral resources is determined by their various properties.

17 – Resources and conflicts
Natural resources can lead societies to prosperity but also fuel conflicts. What are our responsibilities as consumers?

18 – Reserves and resources
How many resources are there left? Which deposits are well known (reserves) and which ones are assumed to exist (resources)? How does a resource become a reserve?

19 – Laws and regulations
The raw material economy is international. This makes legal regulation all the more complex. How does it work?

20 – Responsibility
What can companies and consumers do to ensure that mining does not harm humans or the environment?

21 – Commodity trading
From mining in Australia and business transactions in Zug to speculation in London and use in Shanghai: the path of a traded commodity is often longer than the path travelled by the raw materials.

22 – Switzerland as a hub
No ports or large warehouses and only few refineries... Why, then, is Switzerland considered a hub in the international commodity trade?

23 – Financial flows
Developing countries are often highly dependent on the export of raw materials, which can constitute up to 80 % of total export revenues. However, wealth in natural resources does not automatically lead to growth and prosperity. In fact, 69 % of the world's poorest people live in resource-rich developing countries. How can we explain this paradox?

24 – Worth & values
Who or what determines a resource's value? The global market? Its rarity? The processing costs? We as consumers?

25 – Radioactivity
The radioactive decay of chemical elements is a natural process. It is very useful to us but also has its dangers.

26 – Asbestos
Due to its properties, asbestos was long regarded as an ideal building and fireproofing material. But what makes it a health risk?

27 – Plastic
Around 4 % of world petroleum production is used to make plastic, and a similar amount is consumed as energy in the process.

28 – Cement – our foundation
Cement is one of the world's most important building materials and the basis of our infrastructure. More than 3.4 billion tonnes of cement are produced and used in buildings every year. Where does cement come from? Is our supply guaranteed?

29 – Colourants, cosmetics and fertilisers
Lapis lazuli in paintings, mica in makeup, apatite on the fields.

30 – Transport
Keeping the world economy moving.

31 – Energy and energy sources
"Energy Strategy 2050" in Switzerland: Towards a self-sufficient energy scenario with local renewable energies.

32 – Embodied energy
Embodied energy is the sum of all the energy required to produce any consumer goods or services. How much embodied energy is hidden in our day-to-day lives?

33 – Design
Designing our future! 80 % of a product's environmental impacts and costs are determined at an early stage of its design. This means that product designers have an important role for our future.

34 – Refuse, reduce, reuse, recycle – rethink!
Our natural resources, such as minerals, land, air and water, are being depleted and degraded at an ever faster pace. What can we do to save and protect our resources?

35 – Sustainable living
An environmentally friendly lifestyle can help save resources. How sustainable is your home?

36* – Alternative building materials
Some resources used in the construction industry are becoming increasingly scarce. Are there alternatives to traditional building materials like wood, concrete and steel?

37 – Disposal: landfill and repository
As consumption in Switzerland increases, so does the amount of waste: in 2012, each inhabitant produced 690 kilograms of rubbish, making us the second-biggest waste producers in Europe. What happens to all this waste?

38 – Urban Mining
Buildings and products, waste and landfills – cities are becoming an increasingly rich and important source of raw materials.

39 – Use of the subsurface
How do we use the subsurface? Who owns it? What conflicts can arise between different uses?

40* – Shale gas
What differentiates shale gas from conventional gas? How does fracking work? And what are the risks involved?

41 – Geothermal energy
There is a vast renewable energy resource right under our feet: the heat from the Earth, otherwise known as "geothermal energy". It can be used for heating, cooling and generating electricity.

42 – Recultivation
You can't extract resources without affecting the local environment, but the aim is to restore the site so both nature and local people can benefit.

* not shown at the exhibition in Zug