FUTURIS XVII "CULTURAL HERITAGE"

ENGLISH SCRIPT

0.25

Jaroslaw Kagamiec has been playing organs since he was just 10 years old. Today he's playing his favourite one in the Minor Basilica of St. Andrew, around 60 kilometres east of Krakow in Poland.

It's also one of the oldest of its kind in the country, having been in use since 1611. The signs of ageing are starting to show.

Jaroslav is playing a Rennaissance period piece written specially for the instrument.

0.56

"This organ is a witness to history. Through it we know, with a good degree of precision, what kind of sound was made during the Rennaissance and Baroque periods. We don't have much written documentation of that particular time. But a trained organist can figure out what the music was like back then just by following a musical score, playing it on the keyboard and taking full advantage of the sounds provided by the pipes. Preserving instruments like this is very important for our national cultural heritage."

1.31

This, like Poland's 4,000 or so other historical organs, is at risk.

Its complex internal structure- a labyrinth of wood, iron, lead and tin- is very sensible to any changes in its climatic, biological, chemical and physical environment.

1.44

That's why physicist Lukasz Bratasz makes monthly trips into its insides.

Special sensors and sophisticated computer software allow him to monitor micro-acoustic emissions from cracks in the wooden structure. Cracking is a problem for an organ: too much fractured wood and its bellows will mellow and its wind will stop whistling.

2.11 sot

2.34

In the winter, human activity during a service can see the temperature rise from zero to twenty degrees. Lukasz diagnoses this particular specimen as quite healthy, but says its progress needs to be monitored.

2.49 sot

3.17

Lukasz's data is analysed here at a nearby Polish Academy of Science institute.

The centre is one of seven partners in the European program 'sensorgan', which seek to understand better how indoor climatic environments are affecting Europe's tens of thousands of organs.

How for example wood reacts to sudden changes in temperature and relative humidity.

3.46

Laser mapping helps researchers examine cracks and prevent damage to wooden artwork, artefacts and the little things like picture frames.

Roman Kozlowski is the director of the Cultural Heritage Research unit at the institute.

401 sot

4.24

4.27

Drastic variations in temperature and humidity are much more damaging if the material is directly exposed to the elements.

We are now in Telch, one of the Czech Republics architectural wonders, a medieval town and UNESCO World Heritage Site.

It's gothic heart has survived five centuries of wars, fires, floods and anything else man or mother nature has thrown at it.

But it bears the scars.

Some of these badly-bruised facades were restored just three years ago.

4.56

Civil engineers Milos Drdratchy and Irji Blaha took us on a tour to the top of the tower of the 14th century church of St. Jacques.

At 53 metres, the tower dominates the Telch skyline.

5.15

Its stones are showing signs of stress and fatigue. Two big chunks have already fallen off and more cracks are beginning to spread.

Irji says there's a dangerous combination of materials.

5.26

"Iron was used for these railings and massive but porous stones for the paving. They're stuck together in a place directly exposed to the rain, snow and wind and subject to remarkable temperature changes. So the iron is rusting, gaining volume and in-so-doing cracking the stone and weakening the monument."

5.56

Irji and his colleagues have taken part in a European program called 'Noah's Ark', which looks to forecast the effects of global warming on European Heritage in the medium and long term.

The predictions are gloomy. More and more rain will leak into porous stones. Increased humidity will cause fungi and bacteria to spread over building fronts and roofs.

6.21

Researchers at the Institute of Theorectical and Applied Mechanics in Prague have been using wooden models of complex structures to test a building's response to heavy wind and rain.

6.37

They also test the resistance of different types of stone from historical buildings.

6.52

Considered too dangerous, these two large ornaments were removed from a 14th century church in central Bohemia.

The semi-porous limestone pieces are now used to test water absorbtion and find out how and to what extent humidity and water damage stones. This they hope will lead them to better preventative measures.

For Milos, one such step is constant monitoring.

7.19 sot

8.01

A wall made from a similar stone at Prague Castle is now being carefully restored.

But authenticity is a value and our cultural heritage sites should be allowed to grow old gracefully without too much cosmetic surgery, say many experts. That's why monitoring and prevention comes before restoration whether it is for a simple church organ or a grand gothic cathedral.