



Photographs: R. Tiirmaa and H. Bauert

Did You know that
the first scientifically proven
meteorite impact craters
in Europe are located in Estonia?

Here, meteorite impact craters number approximately 400 times the average on Earth. Saaremaa has Estonia's biggest natural rarity, the Kaali Crater, the meteorite origin of which was the first to be proven in Europe and the second in the world after the Arizona craters in the United States.

Tiesitkö, että Euroopan ensimmäiset tieteellisesti todistetut meteoriittikraatterit sijaitsevat Virossa?

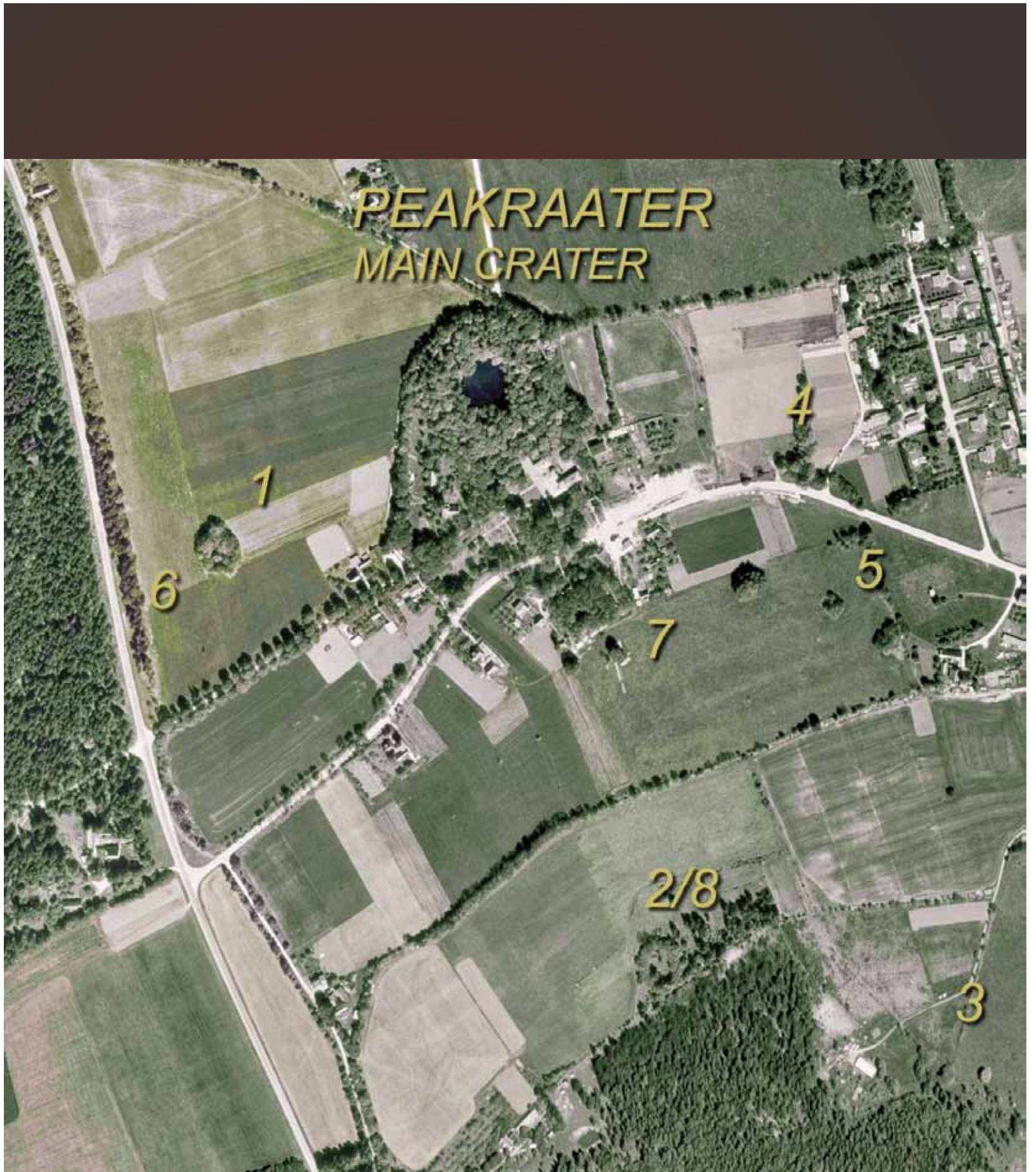
Täällä on meteoriittikraattereita pinta-alayksikköä kohden n. 400 kertaa enemmän kuin maapallolla keskimäärin. Saarenmaalla on Viron suurin luonnonharvinaisuus, Kaalin kraatteri, jonka meteoriittinen alkuperä todistettiin ensimmäisenä Euroopassa ja toisena maailmassa, Yhdysvalloissa sijaitsevien Arizonan kraattereiden jälkeen.

Знаете ли вы, что первые научно доказанные метеоритные кратеры в Европе находятся в Эстонии?

Здесь количество метеоритных кратеров на единицу площади примерно в 400 раз больше, чем в среднем на Земле. Кратер Каали — крупнейший природный феномен Эстонии, метеоритная природа которого была доказана первой в Европе и второй в мире после кратера, находящегося в Аризоне (США).

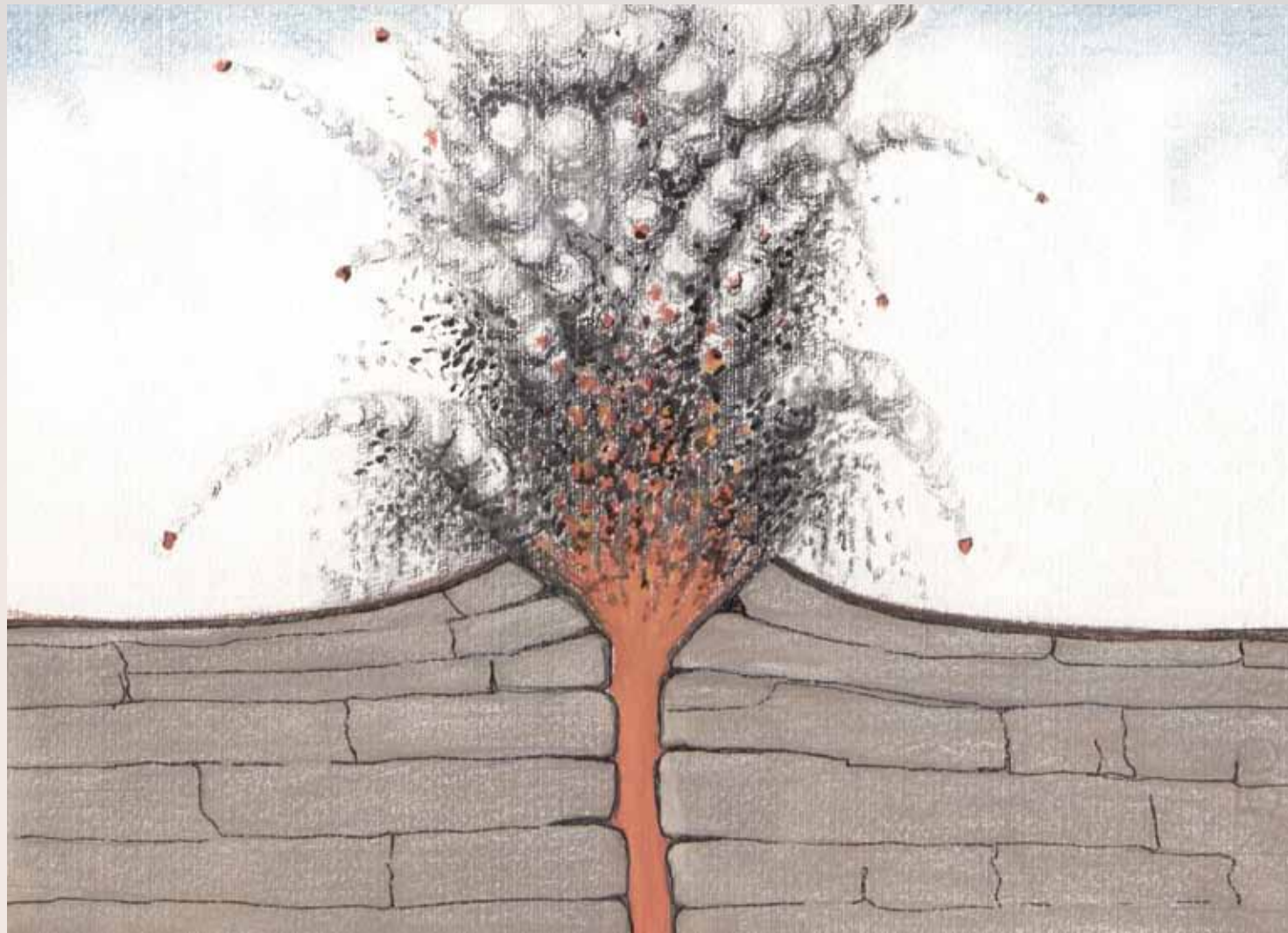
Kas teadsid, et esimesed teaduslikult tõestatud meteoriidikraatrid Euroopas asuvad Eestis?

Siin on meteoriidikraatrideid pindalaühiku kohta u 400 korda rohkem kui Maal keskmiselt. Saaremaal on Eesti suurim loodusharuldus, Kaali kraater, mille meteoriitne päritolu tõestati esimesena Euroopas ja teisena maailmas, USA-s asuvate Arizona kraatrite järel.



PEAKRAATER MAIN CRATER

The meteorite crater field in the vicinity of Kaali is a till plain where clayey basal till is approximately a metre deep in the proximity of the main crater.



Based on finds of silicate explosive material, the craters are between 7,500 and 7,600 years old. From 1827 to 1928, there were several views on how the craters had been created, including an explanation, in 1827, that they were formed “in an underground explosion of fire”.



The mining engineer I. Reinwald proved the meteorite origin of the craters at Kaali in 1937. Analysis of the iron fragments found indicated that the meteorite represents the commonest type of iron meteorite: coarse-grained octahedrite. The biggest fragment weighs 28.4 grams (in the centre in the photograph).

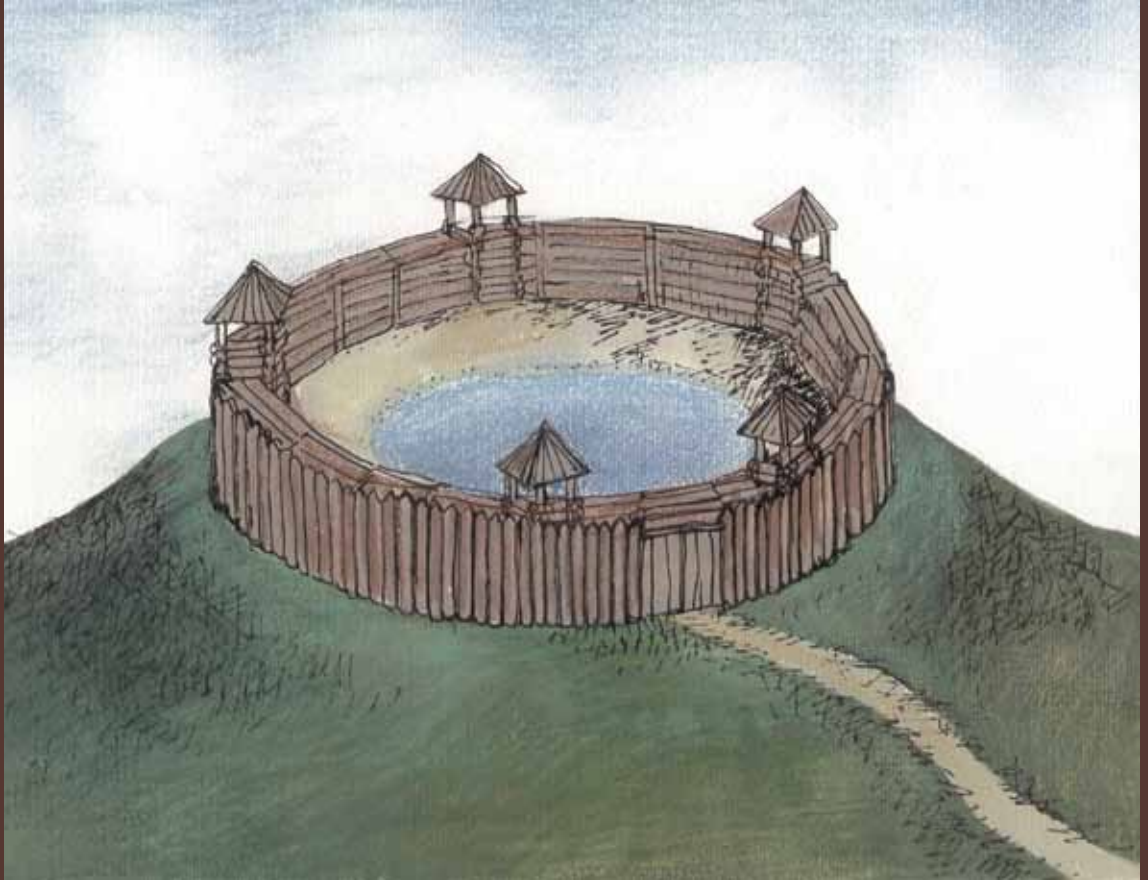


In its layout, the main crater is almost round, with a diameter of 105 to 110 metres from the crest of the mound and an average depth of 22 metres.

Estonian President Lennart Meri considered the Kaali catastrophe to be the epicentre of Nordic folklore in his book "Silverpale" ("Hõbevalge").



In the 7th century BC, Virgil recorded a myth about Phaethon, a son of the Greek Helios, who is supposed to have fallen to Earth like a star, hair flaming on his head, far away in northern lands, leaving behind a deep grave like a small lake. A link to Kaali need not be a mere figment of the imagination, since the catastrophe might have had an impact very far away.



For prehistoric people, the Kaali Crater was a sacred place of worship surrounded by a stone fence 3 metres wide. In 1854, it was thought that it was a prehistoric fortress where a natural lake had been surrounded by a mound piled up by people.



When a meteorite explodes upon impact with the ground, the pressure shock shatters the rock in the ground and creates an explosion crater on the edges of which rock has melted in a mound. The mass of the meteor that created the craters may have been 20 to 80 tonnes, its speed 10 to 20 kilometres per second upon impact with the ground.

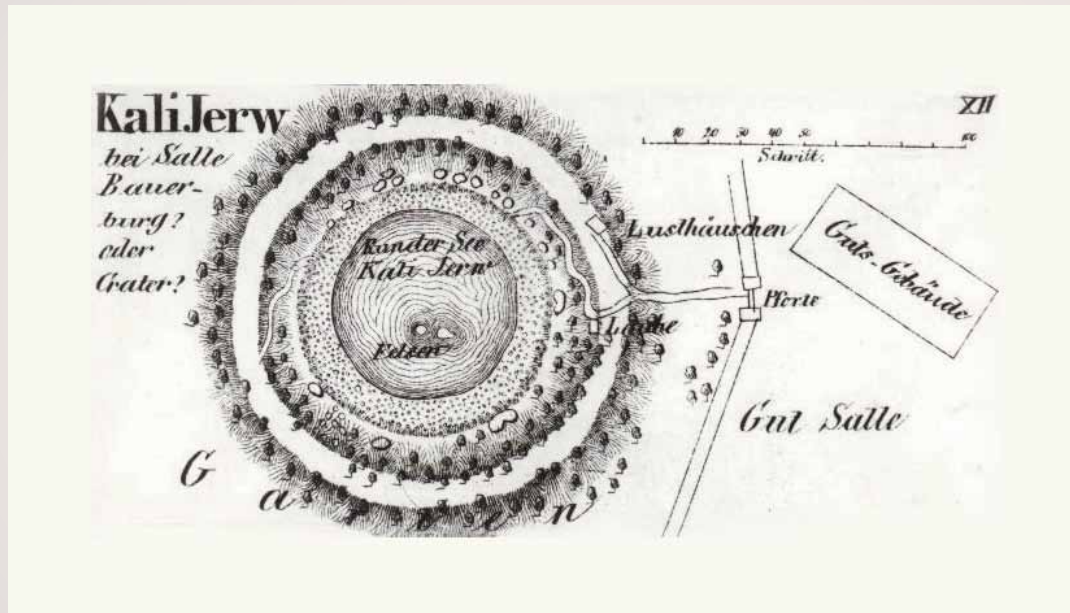
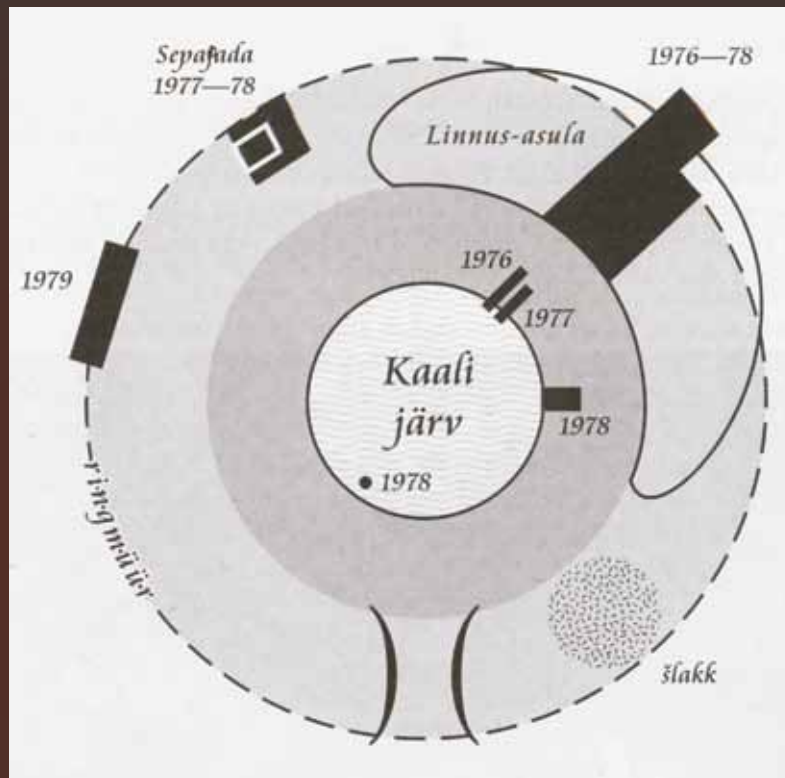


Diagram of the courtyard of the Kaali (Salla) Manor House and of the main crater by F. Kruse, Professor of History at the University of Tartu (“Necrolivonica”, 1842).



The first archaeological excavations at Kaa-li were conducted in 1976 under the supervision of archaeologist V. Lóugas, pictured with Lennart Meri (left).



Archaeological monuments on the mound of the Kaali Crater (V. Lõugas, 1996)



The Kaali Visitor Centre houses the Museum of Meteoritics and Limestone, a conference room and a hotel. The main crater at Kaali is visited annually by 50,000 to 70,000 people from many countries.