Botanising the Caucasus;

Georgia & Armenia

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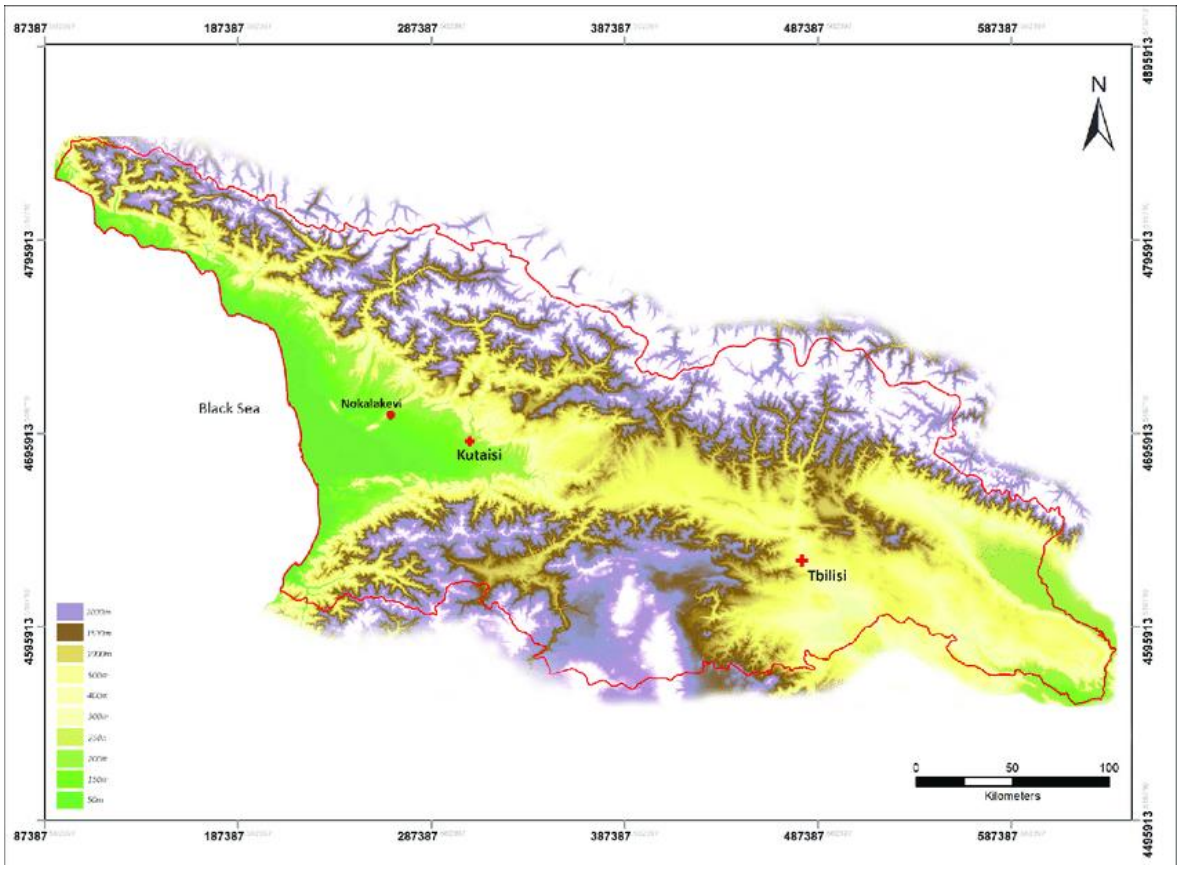
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All images taken by me unless stated otherwise

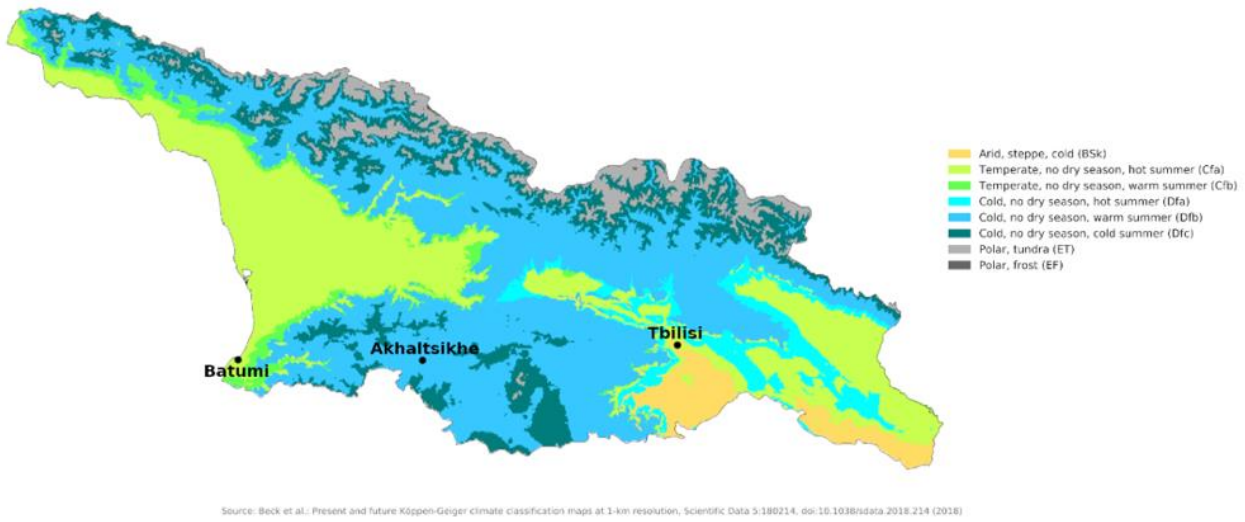
Georgia

Georgia is located in the south Caucasus region. At the crossroads of Europe and Asia, going clockwise it is bordered by Russia, Azerbaijan, Armenia, Turkey and the Black Sea.

Georgia's two major mountains, the Greater Caucasus in the North and the Lesser Caucasus in the South have formed the highly ecologically diverse country that is Georgia and the plants that have specialised within it. The mountains help protect from intense summer heat from South and harsh winter conditions from the North. During the ice ages, they acted in a similar way, creating refuge for temperate plants and animals. Many species survived here where others perished, and these genera spread across Europe and shaped the plant life we know today. Georgia's wide topographic diversity and range in annual precipitation supports an extraordinary diversity of biomes and habitats - from alpine vegetation in the northern mountains, to lush subtropical Colchic rainforests and wetlands in the west, and arid deserts in the east. Georgia contains 13,300 plant species, 380 endemics. With many well known and economically important native species and many ancient grain species.



Topographic map of Georgia (Gate, 2022)



Climate map of Georgia (Atlas, 2018)

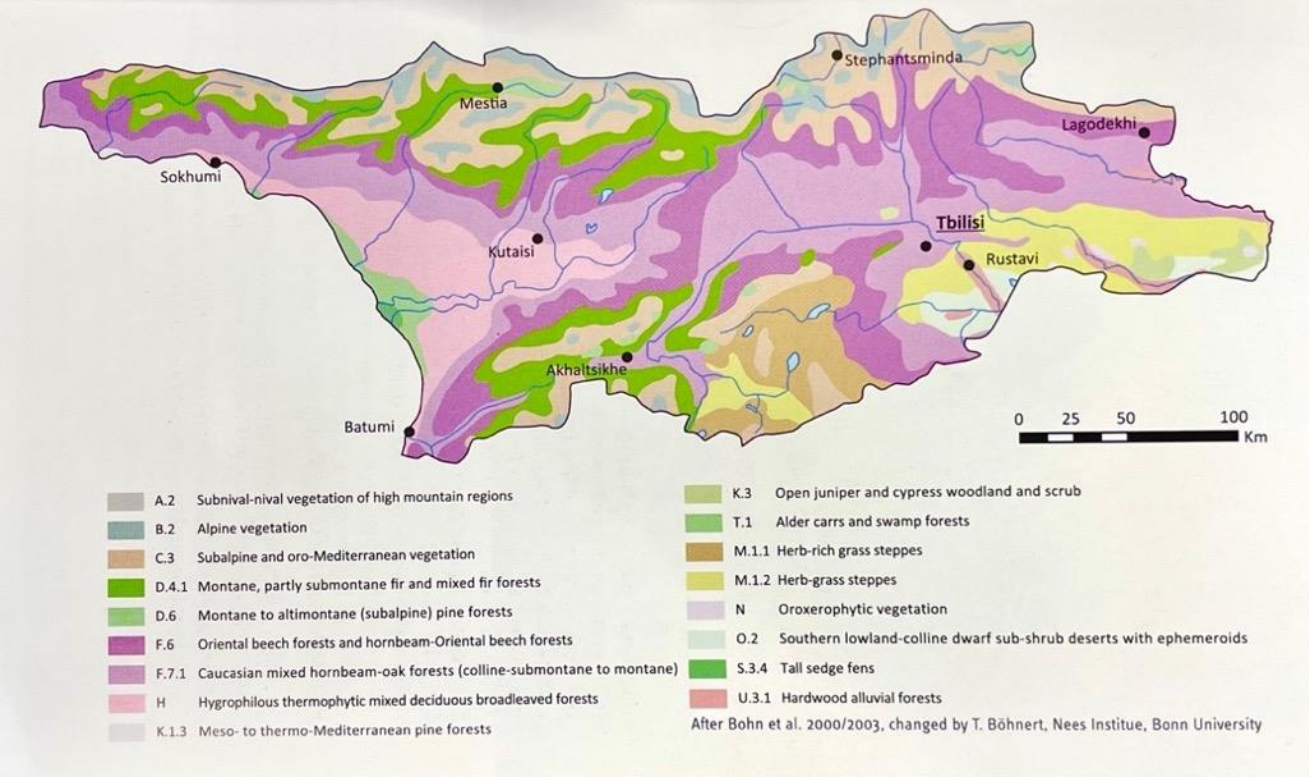


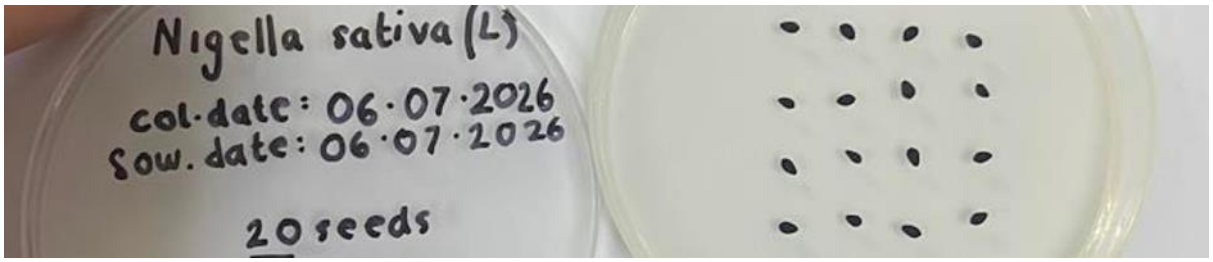
Image taken from: Illustrated Field Guide to the Flora of Georgia, by E. Fischer, A. Gröger, W. Lobin, 2018

Introductions

Day one began first with the Institute of Botany, Ilia State University, meeting staff, being talked through their past, present and future projects and shown their facilities including their herbarium.



The afternoon was then spent with the National Botanic Gardens of Georgia, (NBGG). The lab staff where collecting seeds for long term storage which had been sown and grown in their own non-public stock beds. Before processing them, cleaning, testing for validity, germination tests and labelling.



The NBGG has been involved in many interesting projects in the past few years.



Such as; The Conservation of *Prunus macrocarpa* (Small – fruited Cherry) and *Amygdalus georgica* (Georgian Almond), 'Enhancing rural Caucasian community livelihoods through fruit and nut conservation' and the 'Collection of crop wild relative for future agriculture' and more.

The Deputy Director of NBGG, Tinatin, then talked us through a current project of theirs. Collecting wild crop relative of wheat. Wheat and thus flour and bread making is engrained in Georgian culture and the cultivation of wheat in Georgia has been dated back 5,000 years. Out of 27 species of wheat, 15 are found in Georgia and 5 of which are endemic. As well as many wild or close relatives, like those which the NGBB are collecting. This current project aims to collect these wheat grains for conservation and preservation of genetic diversity. To prevent genetic extinction and genetic diversity for future breeding. Tinatin is a specialised in this field and was excellent to hear her talk on this.



The day ended with a guided tour of the gardens, my favourite things about the gardens where its impressive topography and wild fruit orchard.





Field Trips

The next day, with a big list of plants and locations, we set of for fieldwork just outside southwest of Tbilisi. Nino and Tinatin from the NBGG were collecting seed of *Aegilops tauschii* and *Aegilops cylindzica* amongst other herbs. They were also assessing some native trees such as *Crataegus pontica*, *Carpinus caucasica + orientalis*, *Paliurus spina-christii* and *Acer campestre* - noting locations and assessing fruit maturity for future harvest. We were told that this had been an unusual year for fruit and berry maturation, with higher temperatures and less frequent rainfall throughout the growing season resulting is slow maturation. A part of a pattern that has become increasingly evident over recent years...

We visited three beautiful habitats which where home to their own unique flora.



With the botanists' heads down and hunting, we got to bask in the joy of the second site we had just arrived in. As much as we'd have liked to join in, we sensed they had a job to get done. This site very different from the rocky site before, this semi-natural dry meadow was an explosion of diversity, all tightly interwoven with lots of Thyme, Dianthus, Perennial grasses, Salvias, Achillea. This site has a past disturbance which seemed high in fertility.





Our final stop was another chance to botanise, and collection stop of *Aegilops tauschii*. After enough seed collected, and having flicked enough ticks off my trousers for one day, we were ready to call it and we headed back into Tbilisi.



The next day, we were fortunate to spend the day with two very knowledgeable staff members from the Institute of Botany, Konstantine and Archil. Walking from Azeula Fortress to Kaben Monastery, we crossed a striking mosaic of montane habitats, beginning in open rocky grassland around the volcanic fortress before passing through semi-natural meadows and meadow - forest ecotones, into mixed deciduous woodland and, lower down, wetter riparian vegetation along the Asuretiskhevi. The dramatic changes in habitat over a relatively short distance made for an incredibly varied and botanically rich walk.



Azeula Fortress is situated on top of a volcanic hill just southwest of Tbilisi and although with a long history, is mostly known as the death place the famous Tamar of Georgia in 1213. Standing at 1,340 m high, on clear day, it would come with panoramic views from the castle, but I was not complaining about the grey and misty weather, as it was pleasant break away from the heat of the city. But like any botanical trip for me, I had barely looked up before locking into what was going on by my feet.



Bupleureum falcatum lit up against the grey sky with sprinkles of yellow in this diverse meadow steppe. Going upwards now, the diversity changed. Lichens (we counted 6 different species on one rock), sedums and Alchemilla species, *Allium denudatum*, *Scrophularia versicolor,* and other plants suited to life in between the rocks.



After passing through what Konstantine described as 'Polydominant hemixerophilous shrubbery' - meaning, many dominant, partly dry favouring - we reached a sudden rocky, exposed opening, where the vegetation changed remarkably over a very short distance. This area was characterised by an abundance of lichens, Sedum, *Xeranthemum annuum*, and a red-flowered Allium, creating a striking contrast in both colour and vegetation structure. This abrupt transition illustrates how strongly conditions can influence vegetation composition.



Entering a type of forest habitat mainly represented by *Fraxinus excelsior, Quercus petraea subsp. iberica, Carpinus orientalis* and many shrub species. Down below we noted many species here as well as fungi and some HUGE lichen species and ferns.



Travel to Kazbegi

As you can imagine there were numerous stops for botanising along our route by car. One of them being off the side of the road to see the native *Rhododendron luteum*, which has a widespread distribution across Southeast Europe, most commonly found in the Caucasus and is a well known ornamental plant here in the UK. The surrounding meadow introduced me to some now familiar species as well as some new introductions particularly *Cruciata laevipes*, a Rubiaceae member, alike to the Galium spp. we see as UK natives.



Gaining in altitude. We stopped off at the Georgia-Russia Friendship Monument, not only for the outstanding views across the mountains but for our first introductions to the alpine species of Georgia, Like these *Campanula saxifraga* and *Sempervirens caucasicus*





Ascending higher and higher, we had the chance to stop by and help the staff of The Institute of Botany and see them working on one of their ongoing projects. We assisted in collecting *Juniperus sabina* for their biomass project with Korea.



We stopped off in the two towns of Sno and Juta. Just off Stepantsminda. Grazing has been a traditional part of land use in the Kazbegi region and the small villages of Sno and Juta are home

to the most beautiful meadows I think I've ever been in, at approximately 2,200 m in elevation. These species-rich subalpine grass-forb meadows would have been completely covered in snow just a few months prior. The combination of a short growing season, seasonal snow cover, and traditional grazing and haymaking, helps maintain these diverse open communities, preventing more vigorous species and shrubs from becoming dominant. My standout species included: *Lomelosia Caucasica, Tanacetum coccineum, Platanthera chlorantha, Centaurea cheiranthifolia*. *Plantago medium*. *Silene lacera*. It is remarkable to think that only a few months earlier, this vibrant landscape would as white as the eye could see, making it all the more special to have been there during this brief period when so many of these species were in full flower.



A steep hike up two waterfalls called the Gveleti waterfalls resulted in the chance to observe sub alpine/ alpines vegetation residing amongst water flowing straight from the mountains themselves.It was a great opportunity to see tree species of riparian habitats such as *Betula litwinowii, Sorbus caucasigena, Acer trautvetteri* and more.



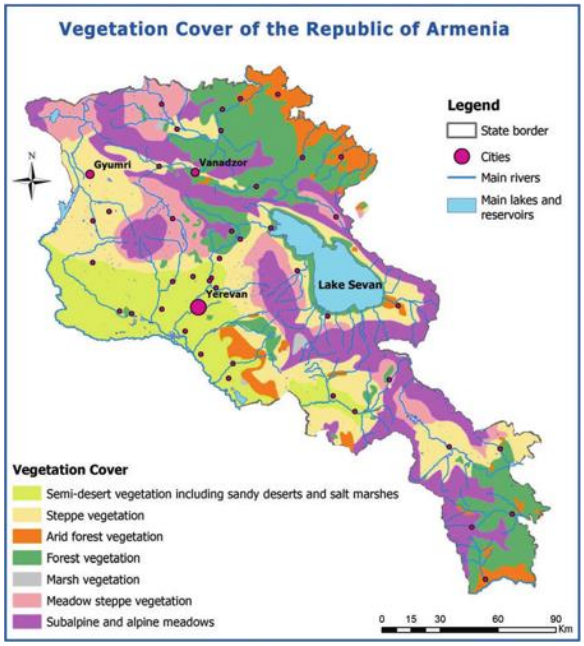
We continued around and back down into Tbilisi the following day. A chance to see another unique plant community at 2,170 metres presented itself as we stopped to see Gergeti Trinity

Church, built in the 14th century. Arriving back to Tbilisi for dinner with David Kikodze, Deputy Director of the Institute of Botany. Our conversations offered fascinating insight into his life and work as a botanist in Georgia, including his experiences of growing up under Soviet rule. We spoke about changing attitudes towards plants, the challenges and threats to nature, and much more.



Armenia

Armenia is a mountainous, landlocked country also in the Caucasus region, going clockwise it is bordered by Georgia, Azerbaijani, Iran and Turkey. Like Georgia, it has an abundance of different vegetation types with the rich flora to match. It has striking ecological variation in a small country. With 32 of Plantlife Important Plant Areas (IPA's), 3800 vascular plant species, 144 Armenian endemics. Just like Georgia, it was an important refuge during the Pleistocene ice ages and is the centre of cultivated plants such as pomegranates, grapes, apricots, wheat and so on.



Vegetation cover of Armenia (Gate, 2025)

In general, Armenia has a continental climate with warm summers and cold winters. Armenia's landscape ranges from snowy covered alpine meadows to subtropical with warm winters.

Quite exhausted after a jam-packed week and exhausting day of travel. Lake Sevan was the perfect location to spend time documenting on the trip thus far, as well as some local botanising. Using field guides and researching plants and habitats of what had been witnessed thus far.



Sevan Lake is the largest body of water in the Caucasus, and sitting at 1,900 metres above sea level it is one of the largest freshwater alpine lakes in Eurasia. It used to be much higher however, During the soviet period, water was diverted from the lake for irrigation and hydroelectric projects, causing the water level to fall by at least 20 meters.

Trips

Sevanavank

Is a famous ninth-century monastery perched on a dry, rocky peninsula on the Lake Sevan. Once an island, it is now connected to mainland and offers incredible views and opportunities to botanise. We explored the plants of dry steppe grassland, rocky slopes, disturbed ground and lakeshore vegetation. The different soil type and exposure created less competitio0n and more specialised plants. On the slopes we saw drought tolerant, cushion forming and aromatic species. Which happened to create the most beautiful tones of pink and orange.





We were very inspired in the surrounding meadows and left Sevanavank monastery with a list of new plants and feeling very inspired. Even the roadsides where a chance to botanise, seeing the most incredible disturbed meadows by petrol stations and motor ways. We couldn't help stopping at many of these along our journeys.



Semyonovka Pass

Another day another chance to see more plants of Armenia and the Semyonovka Pass, - as recommended to us by our Armenian botanist contacts - presented us with many stops across one route of varying altitudes and slightly varying climates. Stop one at high altitudes had a small stream which kept these plants lush. I saw many new species here.



Stop two at higher altitude was a very unique and special landscape of rolling hills and blue sky. There was an abundance of herbs including many we use in cooking. It was a freeing experience to stroll these hills with only green and dots of colourful inflorescences as far as the eye could see.





Descending from both the high altitudes and the high plant excitement, we stopped by the Armenian Ethnic Museum and Winery to see the vineyards and ancient karases, traditional clay vessels used for making and storing wine. Armenia is very proud of its ancient winemaking heritage and claims to be the birthplace of wine, with archaeological evidence dating back more than 6,000 years (much to Georgia's contention!). The country is home to many ancient and indigenous grape varieties, and we learnt about how they maintained their grape vines and even participated in some traditional scything. They make juice, jam and wine here and it was nice to great to see the full process from fruit tree to product on the shelves.



Tavush Province.

One day was spent on fieldwork with Astghik, botanist at A. Takhtajyan Institute of Botany, and Sona, botanist and molecular genetics researcher specializing in plant biodiversity and conservation genetics. On this day we drove to high altitudes and saw a range of mountain meadows of the Tavush Province. We made numerous stops across the day, first seeing lowland meadow and disturbed roadsides with woody species then consistently reach higher until we reached an altitude of around 2,000 metres plus. Our day of botanising took us into Tavush Province, in the rugged mountains of the historic Shamshadin region, between Ijevan and Berd and close to the settlement of Itsakar. The landscape here is very different from the dry, volcanic plains that dominate much of central and southern Armenia.

As we climbed higher, the vegetation changed noticeably. The plants here have to cope with intense ultraviolet radiation, drying mountain winds, large differences between day and night temperatures and a relatively short growing season. Many therefore remain low-growing and compact, hugging the ground rather than investing energy in height. At the same time, a number of high-altitude plants are particularly rich in essential oils and other defensive compounds, which help protect them from UV radiation and herbivores. These compounds also make many mountain plants especially aromatic and highly valued for medicinal teas.



We were particularly lucky to witness a period of synchronous flowering, when many species burst into bloom at almost the same time. Our first stop was in a lower meadow, where taller herbaceous plants grew among scattered oak trees. Here we found Gladiolus tenuis, Thalictrum minus, Geranium sanguineum, Rhinanthus sp., Leucanthemum vulgare and Salvia nemorosa.



As we continued upwards, the vegetation became increasingly characteristic of the mountain meadows. Among the plants we encountered were Pentanema orientale (formerly Inula glandulosa), Astrantia maxima, the Caucasian strantia, and Platanthera chlorantha. We also found Cirsium obvallatum, Hypericum linarioides, Asyneuma campanuloides, Tanacetum coccineum, Pastinaca armena and Pulsatilla armena.



Higher still, the meadows became shorter and more exposed, with plants adapted to the harsher conditions. Here we came across *Pedicularis chroorrhyncha*, before eventually reaching the highest parts of our route. Among the species growing there were Verbascum, an unidentified member of the carrot family (Apiaceae), *Gymnadenia conopsea, Pontechium maculatum, Betonica macrantha, Polygala major* and Filipendula vulgaris. It was a remarkable demonstration of how quickly plant communities can change with altitude - from oak-fringed meadows to increasingly open, low-growing subalpine vegetation, each zone supporting its own distinctive collection of species.



Thank you for reading and thank you to the Merlin Trust for helping me fund this trip. It would not have been possible otherwise and the experience will stay with me throughout my life and horticultural career.



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