

# Grajski vodnjaki

## The Castle Wells

Dušan Kramberger





## Oskrba z vodo na Ljubljanskem gradu

Za življenje nujno potrebujemo vodo. Za pitje, kuho, pomivanje, umivanje, pranje, napajanje živine, zalivanje rastlin. Z vodo so ljudje vedno ravnali skrbno in pozorno.

V vseh utrdbah je bila zanesljiva oskrba z vodo skoraj tako pomembna kot varnost pred napadom sovražnika. Ker na vzpetinah potokov, rek in jezer pač ni, so graditelji in prebivalci morali uporabiti veliko tehnične domiselnosti in spretnosti, da so zbrali dovolj vode za svoje potrebe in jo primerno očistili. Tako cisterne, v katere se je stekala voda s streh in dvorišč, kot vodnjaki, ki so segali globoko do talne vode, so bili vedno skrbno pokriti. Neposredna okolica je morala biti tlakovana ali pokrita z lesenim podom, da se blato ne bi spiralo v jašek. Včasih so prostor celo obzidali in vhod zavarovali z vrati, da se zajetju ne bi približale živali. Na vrhu jaška so postavili kamnit obroč, včasih pa samo lesen dvignjen rob, ki je varoval jašek pred vdorom umazane vode in služil za naslanjanje in odlaganje. Polno vedro so dvigali na različne načine. Posoda je bila včasih le privezana na vrv; na robovih mnogih vencev še vedno vidimo sledi, kako je vrv zarezala v kamen. Da bi bilo dviganje lažje, so vrv ali verigo napeljali čez škripec ali ju navezali na vitel, ki so ga poganjali z ročico ali lesenim vztrajnikom.

Čeprav arheološko dokazani začetki kontinuirane poselitve Grajskega griča segajo v 13. stol. pr. n. š., so arheološke in stavbno zgodovinske raziskave zaenkrat razkrile tehnične naprave za oskrbovanje z vodo le za pozni srednji in novi vek. Opuščeni vodnjaki so vedno dragocen arheološki vir. Na dnu najdemo uhane, zapestnice, glavnike, stara vedra, posodo, kozarce, orodje in podobno gradivo. Tako veliko izvemo o nekdanjem življenju ob vodnjaku.

Koliko vode so grajski prebivalci potrebovali, ne moremo z gotovostjo povedati. Če primerjamo srednjeveško življenje z bivanjem današnjih najpreprostejših ljudstev, je dnevni minimum vode za človeka približno 10 litrov. V normalnih okoliščinah pa lahko verjetno brez velike napake računamo s povprečjem okrog 40 litrov na dan. Mimogrede, moderni meščan v svojem gospodinjstvu porabi vsak dan 200–400 litrov vode!

## Water Supply at the Ljubljana Castle

Water is a necessity of life. It is used for drinking, cooking, bathing, washing dishes and clothes, and watering plants and animals. People have always treated water with care and attention.

In all fortresses, a reliable water supply was almost as important as protection from enemy attack. As there are no streams, rivers or lakes on elevated areas, builders and inhabitants had to use a great deal of technical imagination and skill in order to collect sufficient water for their needs and clean it appropriately. Thus storage tanks into which water from roofs and courtyards flowed and wells reaching deep down to groundwater were always carefully covered, while the immediate environment had to be paved or covered with wooden flooring to ensure that mud did not wash into the shaft. Sometimes the space was even enclosed and the entrance protected with doors to ensure that animals did not approach the reservoir. A stone ring was usually erected around the top of the shaft, or sometimes just a raised wooden rim to prevent dirty water from entering the shaft, as well as serving as a convenient surface on which to lean and place objects. Buckets full of water were raised in various ways. Sometimes the container was simply attached to a rope; on the edges of many wells one can still see traces of how the rope has cut into the stone. In order to draw water more easily, the rope or chain was often run through a pulley or attached to a winch that was operated either with a handle or a wooden flywheel.

Although the archeologically proven beginnings of continuous settlement of the Castle Hill date back to the 13th century BC, archaeological and construction history research has to date only discovered technical devices related to water supply from the late Middle Ages and the modern era. Abandoned wells are always a valuable archeological source. At the bottom of wells, we find earrings, bracelets, combs, old buckets, containers, glasses, tools and similar material. Such finds provide an great deal of insight into life beside the well in former times.

We are unable to determine with any certainty how much water castle inhabitants actually needed. If we compare medieval life with the habitation of the most simple peoples today, a daily minimum of 10 litres of water per person is required. We can fairly accurately estimate that approximately 40 litres of water per person per day was consumed by castle inhabitants under normal circumstances. It is worth noting that in households today the modern citizen uses 200–400 litres of water per day!

Naslovnica/Cover

Vodni zbiralnik pred Palacijem, 60. leta 20. stoletja/The water tank in front of the Palatium in the 1960s (vir/source: ZVKDS, OE LJ)

Vodni zbiralnik pred Palacijem s pogledom na dvorišče/The water tank in front of the Palatium with a view of the courtyard (foto/photo: Miha Mally)



## Vodni zbiralnik na dvorišču

Kakih 40 cm privzdignjen kvadratni plato ob robu dvorišča z likovno povsem nevtralnno novo kamnito krono označuje prvi vodni zbiralnik znotraj grajskega obzidja. Če se po stopnicah ob južnem vogalu spustimo na malo teraso pred grajsko kavarno, vidimo, da je le zgornji del zidu, ki oklepa cisterno, zidan pravilno, medtem ko je zid spodnjega dela precej debelejši in zgrajen nepravilno. To dokazuje, da so v teren najprej izkopali nekoliko večjo luknjo in jo obzidali navznoter ter na ta način prihranili tako pri izkopu gradbene jame kot zidanju zidu z enim licem.

Skozi Zgornji lapidarij pod grajskim dvoriščem pridemo do spodnjega dela zbiralnika. Na južni in severni stranici sta v skladu s konservatorskimi smernicami izrezana nova prehoda. V prerezu skozi zid, ki je na tem mestu debel približno 1,20 m, vidimo, da je bila apneni malta primešana zmleta opeka, ki v vlagi nabrekne in še bolj tesni. Takšno tehniko gradnje so poznali že v antiki. Notranje opečne stene so v več slojih fino obdelane z ometom, ki mu je za vodotesnost dodan še opečni prah.

Stranice so v notranjosti dolge pribl. 6,5 m, dobre 3 m nad tlemi se začneja banjasti obok; koristna prostornina zbiralnika je torej znašala približno 120 m<sup>3</sup>. Prvotni obok je bil sicer nekoliko višji, a so ga znižali, ko so v drugi kaznilniški fazi, v drugi polovici 19. stoletja, izravnavali dvorišče.

Vsakih nekaj vrst so opeke v oboku malo razmaknjene, tako da se tvori kvadratne odprtine 6 cm x 6 cm, skozi katere kaplja voda. Kvadratne odprtine so v spodnjih treh vrstah sezidane tako, da je spodnja opeka za polovico izmaknjena in tvori odkapni nos. Zakaj ne tudi pri zgornjih vrstah? Gotovo zato, ker se na skoraj horizontalnih in malo nagnjenih površinah oboka v temenskem delu kapljica z lahkoto odtrga od roba, v bolj strmih delu proti peti oboka pa bi namesto tega spolzela po površini in izpirala opeko.

Dno cisterne je gladko in z vseh robov poševno pada proti sredinski kvadratni poglobitvi. Na njenih robovih so ohranjeni prepoznavni sledovi tečajev ali nosilcev železne rešetke, ki je vdolbino pokrivala, da z vedri ne bi zadevali v usedlino in kalili vode.

Vodni zbiralnik na dvorišču/The water tank in the courtyard (foto/photo: Miha Mally)

## The Water Tank in the Courtyard

A 40 cm raised square platform on the edge of the courtyard with an undecorated new stone ring marks the location of the first water tank within the castle walls. If we descend the stairs on the southern corner of the courtyard to the small terrace in front of the castle coffee shop, we can see that only the upper part of the wall attached to the water tank is constructed correctly, while the wall on the lower part is significantly wider and constructed incorrectly. This shows that a somewhat larger hole was first dug out and the wall was constructed from the inside, thus in one stroke economising both on digging out the construction pit and on building the wall.

Passing through the Upper Lapidary beneath the castle courtyard, we come to the lower part of the water tank. In accordance with the conservator's instructions, a new passage has been cut on the southern and northern sides. In a slit through the wall, which in this place is approximately 1.2 m wide, we can see that the lime mortar was mixed with crushed brick, which expands when it comes into contact with moisture, making the seal even tighter. This construction technique was known even in antiquity. The inner brick walls are finely worked in many layers of plaster, to which is added brick dust to make them watertight.

In the interior, the walls are approximately 6.5 m long, and a barrel vault begins just over 3 m above the floor, creating a total usable volume of approximately 120 m<sup>3</sup>. The original vault was constructed somewhat higher, but, during the second penitentiary phase in the second half of the 19<sup>th</sup> century, it was lowered when the courtyard was levelled.

Every few rows, the bricks in the vault are slightly displaced so as to form square openings of 6 cm x 6 cm through which water drips. In the lower three rows, the square openings are constructed so that the lower brick is displaced by half of its width, thus forming a drip edge. Why was this not done in the upper rows as well? It is undoubtedly because in the almost horizontal, slightly sloping surfaces at the vertex of the vault, water drops can easily detach themselves from the edge, while in the steeper part towards the foot of the vault, the water drops would instead slide down the surface and rinse the bricks.

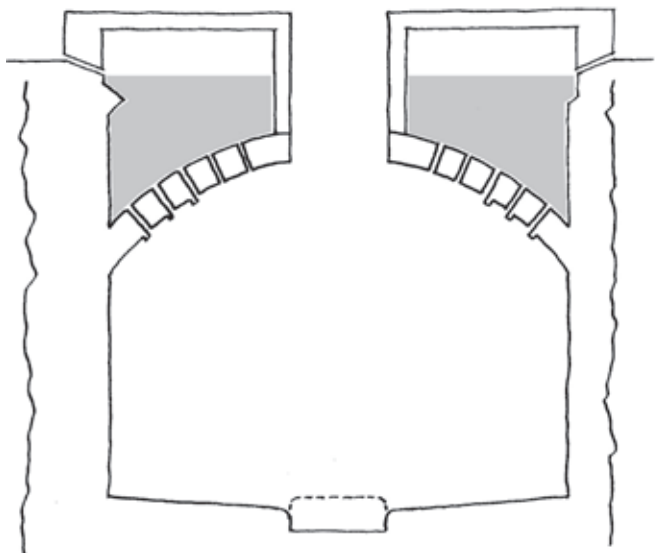
The floor of the tank is smooth and slopes from all of the sides towards a central square depression. On all of its sides, there are still discernible traces of hinges or mounts for ironing grills that covered the hollow to ensure that buckets would not scrape sediment from the walls and muddy the water.

How, then, did this tank work, and how was it used? The entire space above the vault was filled with fine

Kako je torej ta zbiralnik deloval in kako so ga uporabljali? Ves prostor nad obokom je bil napolnjen s peščnim nasutjem. Vodo so s streh po žlebovih in ceveh pripeljali do roba zbiralnika. Voda je pronicala skozi peščeno nasutje in se prefiltrirala. Čista voda je skozi odprtine v oboku kapljala v zbiralnik in ves čas bolj ali manj burkala sicer mirno površino ter vodo prezračevala.

Kakšen je bil vrh zbiralnika, ko je ta služil namenu, ne vemo. V okoliških nasutjih so se znašli kosi razbite, baročno oblikovane krone. Morda ga je varovala ograja, streha ali uta. Ko so opustili dviganje vode z vedri, so na vrh jaška postavili ročno črpalko – »štirno«. Nazadnje, preden se je januarja 1964 z Ljubljanskega gradu odselil zadnji stanovalec, je bila skozi cisterno napeljana samo še vodovodna cev, na zgornji betonski plošči pa je bil pritrjen nosilec za pipo.

Zbiralnik je v bolj ali manj današnji obliki zarisan na prvih tlorisnih upodobitvah Ljubljanskega gradu sredi 17. stol. Noben drug element ne kaže, da bi kakršenkoli vodnjak ali zbiralnik stal na tem mestu že prej. V letih 1630–50 so zabeležene obsežne baročne dozidave in v tej zvezi so brez dvoma morali močno povečati količine razpoložljive vode.



Prerez vodnega zbiralnika na dvorišču/Cross section of the water tank in the courtyard (risba/drawing: Dušan Kramberger)

gravel. The roof water flowed through guttering and pipes to the edge of the tank. There it seeped through the gravel and was thus filtered. The pure water dripped through the openings in the vault into the tank, thus continuously more or less disturbing the otherwise calm surface and airing the water.

We do not know what the top of the tank was like when it served its purpose. In the surrounding gravel, pieces of a broken stone ring of Baroque design have been found. It may have been protected by a fence, a roof or a small hut. When the inhabitants stopped drawing water with buckets, a hand pump was erected at the top of the shaft. Finally, before the last inhabitant moved out of the castle in January 1964, a water pipe was run through the tank and a tap fitting was attached to the upper concrete plate.

The water tank was drawn more or less in today's form on the first ground plans of the Ljubljana Castle dating from the middle of the 17<sup>th</sup> century, and there is no indication that any kind of well or tank stood in the same location prior to that. In the period 1630–50, extensive Baroque additions to the castle were recorded, which undoubtedly resulted in a significant increase in the quantity of water made available.

Notranjost vodnega zbiralnika na dvorišču/The interior of the water tank in the courtyard (foto/photo: Miha Mally)



## Vodni zbiralnik pred Palacijem

Na grajskem dvorišču pred Palacijem preprosta kamnita krona z vklesano letnico 1588 označuje nekdanji vodni zbiralnik. Opasana je z železnima trakovima, zgornjo odprtino zakriva pločevinast pokrov. Na enostavni konstrukciji iz železnih palic je pritrjen kavelj za obešanje škripca, s pomočjo katerega so nekdaj dvigovali vedro z vodo. Kako je bil urejen vrh zajemalnega jaška prej, ne vemo. Sedanji kamnit obroč so na Ljubljanski grad prenesli najbrž v začetku 20. stol., ko so kompleks preurejali za civilno uporabo.

Delovanje lahko, vsaj v grobem, razberemo in razumemo, če se ob kapeli spustimo pod dvoriščno površino v Galerijo »S«. Naravni skladi glinastih skrilarcev so v novozgrajeni podzemni galeriji prežagani, tako da je odprt dostop prav do jedra zbiralnika. Gradnja se je začela s pripravo zbiralne in filtrske jame. Izkoristili so naravno luknjo ali razpoko ter jo s klesanjem povečali do premera približno 6 m in poglobili 4 m pod tedanji nivo dvorišča. Zunanja skalna stena je bila obložena z glino, da voda ne bi odtekala v porozne zemeljske plasti. Sredi tako nastale jame so skopali navzdol še skoraj 5 m globok prostor hruškaste oblike. Potem so nad ustjem spodnjega jaška iz kamna postavili jašek, ki sega do nivoja dvorišča. Prostor med sredinskim jaškom in skalnimi stenami velikega bazena so napolnili z grobim laporjem, ki je deloval kot filter.

Po žlebovih ali cevah so vodo s streh in dvorišč napeljali do zunanjega roba jame, od koder se je počasi stekala navzdol in precejala skozi kamenje. Zgornji del zajemalnega jaška, ki sega skozi filtrsko nasutje do površja, je znotraj fino ometan, zato neprečiščena voda ni mogla pronicati vanj. Šele prav ob dnu filtra, na globini štirih metrov, so vgradili štiri, nekaj niže pa še štiri lijake za dotok prečiščene vode v zbiralno-zajemalni del. Zbiralnik pa je imel dober meter pod površino terena urejen preliv, po katerem je odtekala čista voda, ko je dosegla v zbiralniku najvišjo, vnaprej določeno višino. Zbiralni jašek namreč ni smel nikoli biti poln čisto do vrha. Največja uporabna prostornina zbiralnega dela cisterne tako dosega približno 30 m<sup>3</sup>.

Vsakič ko so izvlekli vedro vode, se je gladina v zbiralnem jašku znižala in se potem spet počasi izravnala z vodo iz filtra, viški vode pa so odtekali. Tako se je voda kar naprej pretakala, premikala in ostajala sveža.

Kar se tiče datacije sedanjega filtrskega zbiralnika, so arheološke raziskave prepričljivo

## The Water Tank in Front of the Palatium

In the castle courtyard in front of the Palatium, a simple stone ring with the year 1588 engraved on it marks a former water tank. Girded with iron strips, the upper opening is protected with a tin cover. On a simple construction made from iron bars, a hook is attached for hanging a pulley, which was once used for drawing a bucket with water. We do not know how the top of the accumulation shaft was arranged. The current stone ring was probably brought to the Ljubljana Castle at the beginning of the 20<sup>th</sup> century, when the complex was reorganised for civil use.

We can discern and understand the operation of the water tank, at least in rough terms, if we descend below the level of the courtyard in the "S" Gallery, beside the chapel. In the newly reconstructed underground gallery, the natural layers of clay slate are cut, enabling open access right to the core of the tank. Construction commenced with the preparation of accumulation and filtration shafts. The builders took advantage of natural holes and gaps in the rock, which they chiselled away to a diameter of 6 m and a depth of approximately 4 m beneath the current level of the courtyard. The exterior stone wall was smeared with argil to prevent the water from unnecessarily flowing off into the porous layers of soil. In the centre of the shafts thus created, they then dug down a further 5 m, creating a pear-shaped space. Above the lip of the lower shaft, they erected a stone spindle, reaching up to the level of the courtyard. The space from the outer edge of the central shaft to the stone walls of the large pool were filled with rough marl, and this served as a filter.

Water from the roofs and courtyards flowed through guttering and pipes to the outer edge of the shaft, from where it slowly flowed down and filtered through the stones. The upper part of the accumulation shaft, which reaches through the filtration gravel to the surface, is lined on the inside with fine plaster to prevent non-purified water seeping in. Only right at the bottom of the filter, at a depth of four meters, are there four sinks, with four more being constructed a bit lower. These sinks facilitate the flow of purified water to the accumulation part. Just over a metre below the level of the terrain, a channel has been made through which clean water can flow off when the predetermined maximum level of the tank is reached. Thus the accumulation shaft was never allowed to fill right to the top. The maximum usable volume of the accumulation part of the tank was therefore approximately 30 m<sup>3</sup>.

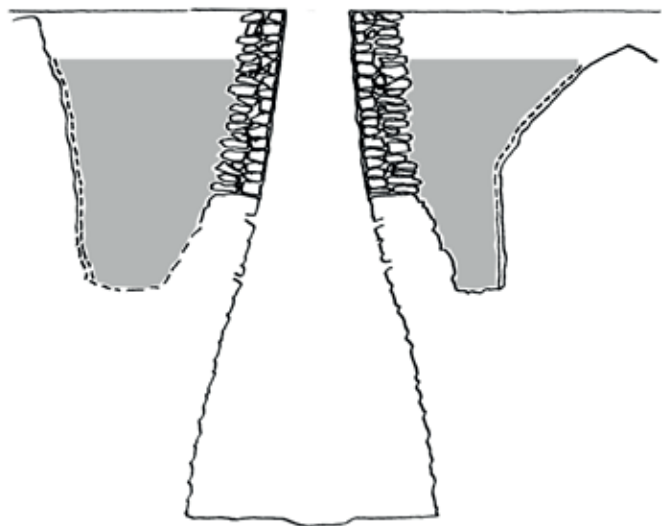
Every time water was drawn from the well, the water level of the accumulation tank lowered and was then

Vodni zbiralnik pred Palacijem/The water tank in front of the Palatium (foto/photo: Miha Mally)



dokazale, da je nastal s predelavo neke prejšnje cisterne. Po izgradnji novega, močno povečanega gradu v drugi polovici 15. stol. je bilo treba zagotoviti večje količine vode. Zato so ob novem, takrat še pretežno lesenem zahodnem palaciju v začetku 16. stoletja predelali stari zbiralnik v večjo filtrsko cisterno. Zbiralnik je bil zadnjič temeljito očiščen, morda pa tudi poglobljen, najverjetneje konec 19. ali v začetku 20. stol., saj v njem arheologi niso našli nobenih starejših predmetov.

Opisani tip filtrske cisterne je bil v srednjem veku na izpostavljenih srednjeveških višinskih lokacijah pogost. Pri nas so arheologi razen na Ljubljanskem gradu dobro raziskali npr. dva takšna zbiralnika v ruševinah gradu na Kozlovem robu nad Tolminom, na Starem gradu nad Celjem in znotraj stolpa v Štanjelu na Krasu, a jih zagotovo še veliko ostaja neodkritih ali neprepoznanih. Toliko bolj smo lahko zato veseli nazorne in didaktične prezentacije na Ljubljanskem gradu.



Prerez vodnega zbiralnika pred Palacijem/Cross section of the water tank in front of the Palatium (risba/drawing: Dušan Kramberger)

slowly filled again with water from the filter, with any excess water flowing off. Thus the water constantly circulated, shifted and remained fresh.

As far as the dating of the current filtration tank is concerned, archaeological research has convincingly demonstrated that it was built in conjunction with the reconstruction of a previous tank. After the construction of the new much enlarged castle in the second half of the 15<sup>th</sup> century, there was a need to ensure the availability of a larger quantity of water. Next to the new, then still mainly wooden western palace, the old tank was therefore rebuilt into a larger filtration tank at the beginning of the 16<sup>th</sup> century. The tank was probably last thoroughly cleaned – and maybe also deepened – at the end of the 19<sup>th</sup> century or the beginning of the 20<sup>th</sup> century, as archaeologists have not found any ancient objects in it.

In the Middle Ages, the type of filtration tank described above was common in exposed, elevated locations. Apart from those in the Ljubljana Castle, archaeologists have, for instance, examined two such tanks in the ruins of the castle in Kozlov rob above Tolmin, in Stari grad above Celje and in the inner tower in Štanjel in Kras, but there are undoubtedly even more that remain undiscovered and unrecognised in Slovenia. We can therefore be even more grateful for the detailed and instructive presentation at the Ljubljana Castle.

Kamnito vreteno vodnega zbiralnika pred Palacijem/The stone spindle of the water tank in front of the Palatium (foto/photo: Miha Mally)



## Vodnjak pred Peterokotnim stolpom

Kmalu po tem, ko so sredi 60. let 20. stol. na Ljubljanskem gradu stekla prva resna raziskovalna in obnovitvena dela, se je iz debelih nasutij ob južnem robu grajskega dvorišča pred Peterokotnim stolpom pojavil dotlejš nepoznan vodnjak. Konservatorji so takoj podvomili, da bi bil sploh kdaj zares v uporabi oziroma vsaj ne v obdobju, ko je skozi Peterokotni stolp potekal glavni promet v grad in iz njega in je v traktu, v katerem je danes gostilna, delovala orožarna. Zdaj na obstoj vodnjaka v podzemlju opozarja kamnit venec v pohodni ravnini dvoriščnih tal.

Če se spustimo v Zgornji lapidarij, se na tem mestu znajdemo pred kamnitim jaškom. Glede na grobo strukturo svoje zunanosti je lahko nastal le tako, da so v teren najprej izkopali globoko navpično luknjo in jo nato z notranje strani obložili s kamni. Vendar se kamen na globini dobrih 9 m pod dvoriščem konča in od tod navzdol so vodnjakove stene opečne. Prav tam na jugozahodni strani ozka, nizka odprtina vodi v podzemni hodnik. Hodniček poteka od vodnjaka pod zunanjim grajskim obzidjem navzven in se na prostem pojavi v vogalu tik ob steni Peterokotnega stolpa.

To je morda le domiselno zasnovan ubežni hodnik, ki je omogočal grajskim prebivalcem s posebnimi nalogami, da na skritem, ne izpostavljenem delu neopazno zapustijo grad. Vodnjak namreč ne sega do globine podtalnice in tudi ni urejen kot zbiralnik meteorne vode s prečiščevanjem. Na grajskem dvorišču, tik ob glavnem vходу oz. izhodu, so skopali jašek in ga v vsem oblikovali kot vodnjak. Vanj se je tudi dejansko stekalo nekaj vode. Na pohodnem nivoju je jašek zapiral le pokrov, brez krone, saj bi ovirala promet. Spodnji del vodnjaka, ki je bil precej pod nivojem terena na zunanji strani obzidja, so pozidali vodotesno z opeko. V tem delu se je vedno zadrževala voda. Če je kdo pogledal v vodnjak z vrha, je videl gladino. Tisti, ki so skrivnost poznali, so se po vrvi spustili v vodnjak in tik nad vodno gladino našli ozek hodnik, ki jih je popeljal izpod obzidja na breg grajskega jarka.

### Ubežni hodnik in Erazem Predjamski

*Skozi ta ubežni hodnik naj bi pobegnil tudi vitez Erazem Luegger, v slovenskem izročilu znan tudi kot Erazem Predjamski, za katerega legenda pripoveduje, da je bil zaprt na Ljubljanskem gradu. Mnogi so si belili glave, kako mu je uspelo pobegniti, saj je grad močno zavarovan, dvizni most ponoči dvignjen in neopazen pobeg*

## The Well in Front of the Pentagonal Tower

Soon after the first serious research and renovation work commenced at the Ljubljana Castle in the mid 1960s, a previously unknown well was revealed in the rough gravel on the southern edge of the castle courtyard in front of the Pentagonal Tower. Conservators immediately doubted that the well had ever actually been in use, at least not in the period when the main traffic to and from the castle flowed through the Pentagonal Tower and an armoury operated in the tract in which the restaurant is now located. Today, the existence of an underground well is evidenced by the stone ring embedded in the walking surface of the courtyard.

If we descend to the Upper Lapidary, we find ourselves before a stone shaft in this place. Given the rough structure of the exterior, it can only have come about by a deep vertical hole first being dug out in the terrain and subsequently being lined with stone from the inside. However, the stone extends to just over 9 m below the courtyard, below which the well's walls are made of brick. On the southwest side of the brick wall, there is a narrow, low opening that leads to an underground passage. This small passage leads from the well beneath the exterior castle wall and out to an opening on the corner just below the wall of the Pentagonal Tower.

This might only be an imaginatively designed escape passage that enabled castle inhabitants with special tasks to leave the castle unnoticed at a hidden, unexposed place. The well does not reach the level of the groundwater and was not constructed as a tank for meteor water with filtering system. In the castle courtyard, just beside the main entrance and exit, a shaft was dug and shaped in all respects like a well. Some water did in fact flow into it. On the walking level of the courtyard, the shaft was closed with a cover, without a stone ring, which would have obstructed traffic. The lower part of the well, which was significantly below the level of the terrain on the external side of the wall, was constructed in a watertight way with brick. In this part, there was always water, and if anyone looked into the well from the top, they would see the surface of the water. Those who knew the secret would let themselves into the well on a rope and just above the surface of the water would find the narrow passageway that would lead them beneath the walls to the edge of the castle moat.

### The Escape Passage and Erazem of Predjama

*It is through the escape passage that the knight Erazem Luegger is said to have escaped. Legend has it that Luegger, who in Slovenian tradition is also known as Erazem of Predjama, was imprisoned in the Ljubljana Castle. Many were mystified as to how he had managed*

*skoraj nemogoč. Po vsej verjetnosti je podkupil stražarja, ta pa mu je pokazal skrivni izhod. Zanimivo je tudi to, da se je natanko nad izhodom iz rova visoko v obzidju nahajalo stranišče. Tja so ga postavili, da bi odvrnili morebitne iskalce skrivnega izhoda.*

Ta navidezni vodnjak ni mogel nastati prej kot v drugi polovici 15. stol. Šele takrat so se za obzidjem začeli nabirati debeli sloji nasutij, v katere je bil vodnjak nedvomno vkopan, in v 16. stol. omogočili postavitev prvih zidanih dvoriščnih traktov. Na tlorisih iz sredine 17. stol. vodnjak sicer ni označen. Glede na njegovo čisto posebno funkcijo lahko razumemo, da niso želeli preveč govoriti o njem in ga označevati na načrtih. Malo verjetno je, da bi ga zgradili (in potrebovali) šele v času Kaznilnice v 19. stol., ko pa je bil ukinjen zunanji dostop v grad skozi Peterokotni stolp in je bil ta del dvorišča namenjen zapornikom.

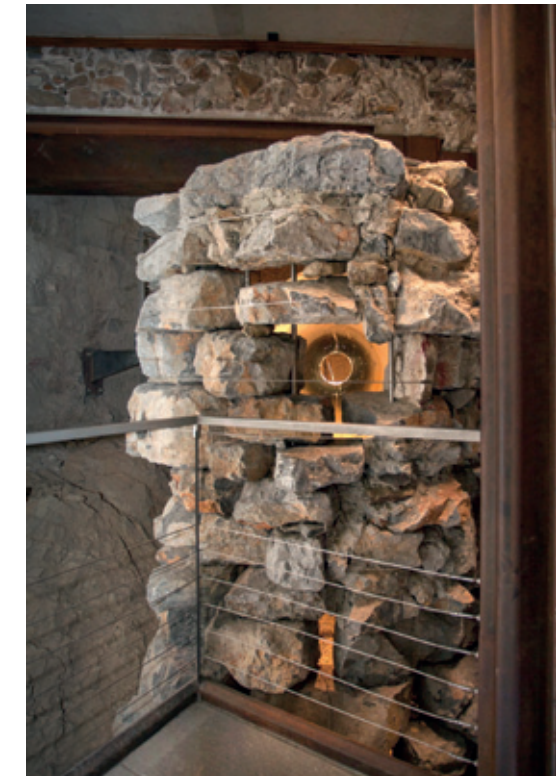
Prezentacija vodnjaka na dvorišču pred Peterokotnim stolpom/Presentation of the well in the courtyard in front of the Pentagonal Tower (foto/photo: Miha Mally)



*to escape, as the castle was heavily guarded, the drawbridge was raised at night and to escape unnoticed was thought to be almost impossible. Most likely Luegger bribed a guard to show him the secret exit. It is interesting to note that directly above the exit point from the passage there was a toilet located high up in the wall. It was placed there to discourage anyone who may want to seek out the hidden exit.*

This apparent well could not have been constructed before the second half of the 15<sup>th</sup> century. Only then did a sufficiently thick layer of gravel begin to accumulate behind the walls. It was in this gravel that the well was undoubtedly dug, while it also enabled the construction of the first masonry courtyard tracts in the 16<sup>th</sup> century. The well is not marked on ground plans from the mid 17<sup>th</sup> century, but in view of its very special function it is entirely understandable that the castle's residents did not want to speak about it too much or mark it on plans. It is unlikely that it was built (and needed) only in the penitentiary period in the 19<sup>th</sup> century, when outside access to the castle through the Pentagonal Tower was actually discontinued and that part of the courtyard was devoted to prisoners.

Kamnit jašek vodnjaka pred Peterokotnim stolpom/The stone shaft of the well in front of the Pentagonal Tower (foto/photo: Miha Mally)



## Vodnjak s pohodnim gonilnim kolesom pred Ljubljanskim gradom

Ob robu ploščadi pred Ljubljanskim gradom, na koncu kratkega stranskega kostanjevega dvojnega drevoreda je v skromni hišici skrit znameniti grajski vodnjak s pohodnim gonilnim kolesom. V času delovanja se je vodnjak polnil s talno vodo, ki se je nabirala v kamninski gubi Grajskega griča, nepropustni za vodo.

V drugi polovici 15. stol. ko je Friderik III. Habsburški postavil grad v današnjem obsegu, so na tem mestu nasuli hrib Lipnik, da so omogočili skoraj horizontalen dostop prek dviznega mostu v Peterokotni stolp in v grad. Med preurejanjem gradu v Kaznilnico v začetku 19. stol. so visoki vhod v Peterokotnem stolpu opustili in prebili nov dostop v jugovzhodnem kotu gradu, ki še danes služi kot glavni vhod v grajsko jedro. Za novi dostop so morali zasuti precejšen del grajskega obrambnega jarka. Tako so nasuti Lipnik začeli spet odkopavati in pri tem našli na star vodnjak.

### Vodnjak v času Kaznilnice

*V času ko je bil Ljubljanski grad popolnoma preurejen za namen Kaznilnice in ko so na tem mestu odkrili vodnjak, naj bi za očiščenje le-tega zadolžili dva kaznjenca. Obljubljeno jima je bilo, da bosta izpuščena, ko prideta do vode. Po legendi naj bi eden od njiju po 18 letih dela umrl. Drugi naj bi imel več sreče, saj naj bi se kmalu po smrti sotrpina dokopal do vode in bil nato izpuščen na svobodo.*

Še vedno ni mogoče z gotovostjo reči, kako daleč v preteklost sega njegov nastanek. Ob njem so na grajskem platoju našli rimske artefakte, med njimi kipec božanstva Bellenus in votivne oltarčke, posvečene vodnemu božanstvu Aequornu. Toda antični ostanki bi utegnili sem zaiti skupaj z gradbenim materialom iz propadlega rimskega mesta Emone med gradnjo poznosrednjeveške utrdbe. Po drugi strani je čudno, da Friderik ne bi obdržal vodnjaka, če bi nanj naletel ali zanj vedel. Kakorkoli že, v prvi polovici 19. stol. so vodnjak spet odkrili in ga usposobili.

Znotraj hišice je v sredini trebušasta kamnita krona, nad njo pa vitel za dve vedri. 16. januarja 1915 so izmerili, da ima jašek premer 1,50 m in sega z dnom 58 m globoko. Dviganje vode iz takšne globine je težko, zato so ob vitlu postavili gonilno kolo, v katerega so vstopali ljudje in ga premikali s svojo težo. Z manjšimi popravili zaradi dotrajnosti lesa naj bi to bilo isto kolo, ki ga vidimo nad vodnjakom še danes. Ob notranjih stenah so

## The Well with a Walking Drive Wheel in Front of the Ljubljana Castle

On the edge of the platform in front of the Ljubljana Castle, at the end of a short side avenue lined with chestnut trees, there is a modest hut that conceals the extraordinary castle well with a walking drive wheel. When it was in operation, the well filled itself from the groundwater that accumulated in the stone fold of the Castle Hill, which was impervious to water.

In the second half of the 15<sup>th</sup> century, when Frederick III of Hapsburg established the castle in the dimensions in which we know it today, the artificial hill known as Lipnik was built on this location, enabling almost horizontal access across the drawbridge to the Pentagonal Tower and into the castle. While rearranging the castle into a penitentiary at the beginning of the 19<sup>th</sup> century, the high entry into Pentagonal Tower was abandoned and a new access in the south-eastern corner of the castle was built, which today serves as the main entry to the centre of the castle. In order to construct this new access, it was necessary to fill in a significant part of the castle's defence moat. Thus they again began to dig out the Lipnik hill, and in so doing came across an old well.

### The Well in the Time of the Penitentiary

*At the time when the Ljubljana Castle was completely reorganised into a penitentiary, and when the well was discovered on this location, two prisoners were apparently assigned the task of cleaning the well. The prisoners were promised their freedom if they managed to dig down to water. Legend has it that one of the prisoners died after 18 years of work. The second prisoner had more luck, as soon after the death of his fellow sufferer he struck water and thus won his freedom.*

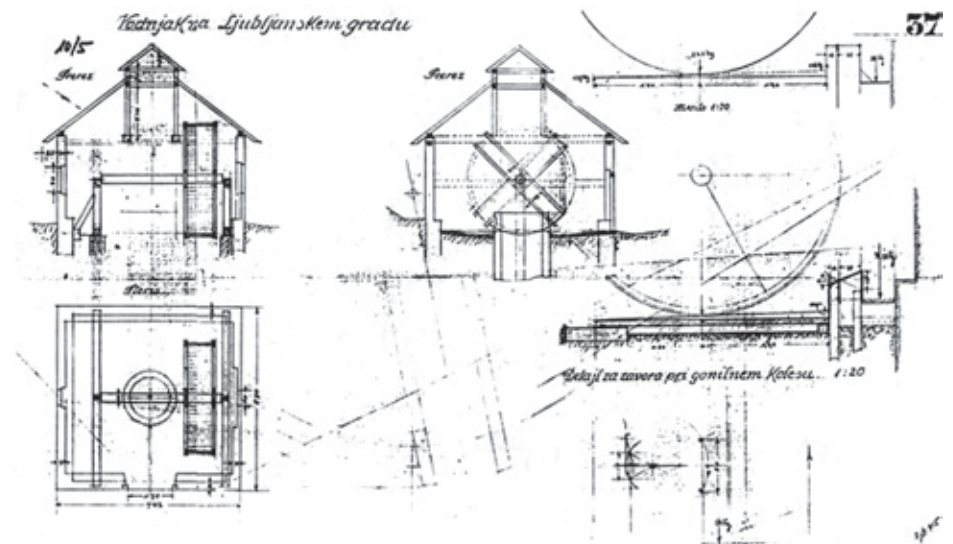
It is still impossible to determine with any sureness how far back in the past the well was constructed. Roman artefacts were found beside the well on the castle plateau, including a statue of the deity Belenus and small consecrated altars dedicated to the water deity Aequorna. However, it is possible that antique remains we deposited here along with building material from the ruins of the Roman city of Emona during the construction of the late mediaeval fortress. On the other hand, it is strange that Frederick did not retain the well if he had come across it and knew about it. In any case, in the first half of the 19<sup>th</sup> century, the well was again discovered and restored to working order.

In the centre of the space inside the hut, there is a bulbous stone circular wall, above which is a winch for two buckets. On 16 January 1915, the shaft was measured and found to have a diameter of 1.5 m and the depth of 50 m. Drawing water from such a depth was difficult,



Notranjost vodnjaka s pohodnim gonilnim kolesom pred Ljubljanskim gradom/The interior of the well with a walking drive wheel in front of the Ljubljana Castle (foto/photo: Branko Čeak)

Načrt vodnjaka s pohodnim gonilnim kolesom iz začetka 20. stoletja /Plan of the well with a walking drive wheel from the beginning of the 20<sup>th</sup> century (vir/source: SI ZAL LJ / 334, m. 010-003, a. e. 35)





sezidane klopi. Tam so prebivalci Grajskega griča, ki v svojih domovih niso imeli lastnih vodnjakov, čakali, da kaznjenci dvignejo polna vedra iz globine. V arhivu Zgodovinskega arhiva Ljubljana je ohranjen tudi načrt iz začetka 20. stoletja za posebno zavoro pri gonilnem kolesu. Gotovo je bila teža dveh polnih veder in vrvi ali verig tako velika, da je bilo težko zadrževati vreteno pri spuščanju. Iz projekta pa ni razvidno, ali sta bila tudi kolo in vreteno postavljena na novo ali le obnovljena. Prav tako ni povsem jasno, če je hišica nad vodnjakom stala že prej in so zidove le obnovili in postavili streho s prezračevanjem, ali so vse postavili na novo.

Predstava, da so morali ljudje stopati v takšno kolo in ga poganjati s svojo lastno silo, je za današnji čas precej nenavadna. In vendar se pri takem načinu dvigovanja bremen večina dela opravi s preprostim prestopanjem in težo telesa. Tovrstni princip je v tehniški zgodovini splošno znan, uporabljan je bil zlasti v srednjem veku v pristaniščih in na gradbiščih. Vodnjak na ploščadi pred Ljubljanskim gradom sodi med večje tovrstne naprave. Izjemen pomen v okviru tehniške dediščine pa dosega zaradi povsem ohranjenega gonilnega kolesa in vretena.

Vodnjak na Sancah/The well at Sance  
(foto/photo: Miha Mally)



and so alongside the winch a drive wheel was erected into which people could enter so as to move the wheel with their body weight. Apart from small repairs due to the wood wearing out, this is apparently the same wheel that we still see above the well today. Benches were built along the inside walls of the hut, on which inhabitants of the Castle Hill who did not have their own well in their homes could wait while prisoners raised buckets full of water from the depths. In the archives of the Historical Archive Ljubljana, there is a plan from the beginning of the 20<sup>th</sup> century that shows the design of a special brake for the driving wheel. The weight of two full buckets along with the ropes or chains was obviously so great that it was difficult to control the spindle when buckets were lowered. It is impossible to determine from the plans whether the wheel and spindle were also erected anew or renovated. Nor is it entirely clear whether the hut above the well was already standing and they simply renovated the walls and erected a roof with ventilation, or whether everything was constructed from scratch.

By today's standards, the idea that people had to enter such a wheel and drive it with their own force is rather unusual. With this way of lifting a load, however, the majority of the work is done by simply shifting the weight of the body from one foot to the other. Principles of this kind are well known in technical history, having been used particularly in the Middle Ages at ports and building sites. The well on the platform in front of the Ljubljana Castle is amongst the largest constructions of this kind. Its extraordinary importance within the framework of technical heritage is primarily due to the preserved drive wheel and spindle.

## Voda na Grajskem griču

Na širšem območju gradu najdemo še več vodnjakov, zajetij in solzil. Vodnjaka na Šancah in Osojah tako rekoč spadata h gradu. Malo nižje je izvir ob Sodarski stezi, ki od cerkve sv. Florijana vodi k nekdanji rabljevi hiši pod Šancami, še znotraj nekdanjega mestnega obzidja.

### Rabljevo domovanje

*Poklic rablja je bil nujni in sestavni del novoveške družbe, vendar je veljal za nečastnega, rabelj pa za človeka, ki so se mu ljudje raje na daleč izognili, kot da bi ga srečali. Da bi ga čim bolj umaknile izpred oči meščanov, so mu mestne oblasti novo domovanje našle na današnji Sodarski stezi, ki je v tistem času veljala za odročen in neugleden mestni predel. Pred tem je stanoval v še bolj odmaknjeni soteski med Grajskim gričem in Golovcem, vendar se je moral leta 1772, ko se je začela gradnja Gruberjevega kanala, preseliti. Rabljeva hiša naj bi bila porušena leta 1809 ob spopadih Francozov in Avstrijcev, rabelj pa se je takrat preselil na Koroško.*

Skoraj vsaka stanovanjska hiša na Rebri in drugod po Grajskem griču je imela v kleti svoj lastni vodnjak oz. zajetje. Žal so med gradnjo cestnega predora pod Ljubljanski gradom leta 1952 kljub opozorilom geologov prebili nepropustne kamninske plasti na dnu zemeljske gube in voda, ki se je prej tisočletja dolgo nabirala in zadrževala v njej, je iztekla. Takrat so presahnili tudi mnogi vodni viri po Stari Ljubljani, osuševanje zemeljskih plasti pa je povzročilo sesedanje in pokanje poslopij.

Vodnjak na Osojah/The well at Osoje (foto/  
photo: Miha Mally)



Izvir ob Sodarski stezi/The spring by the Sodarski  
Path (foto/photo: Miha Mally)



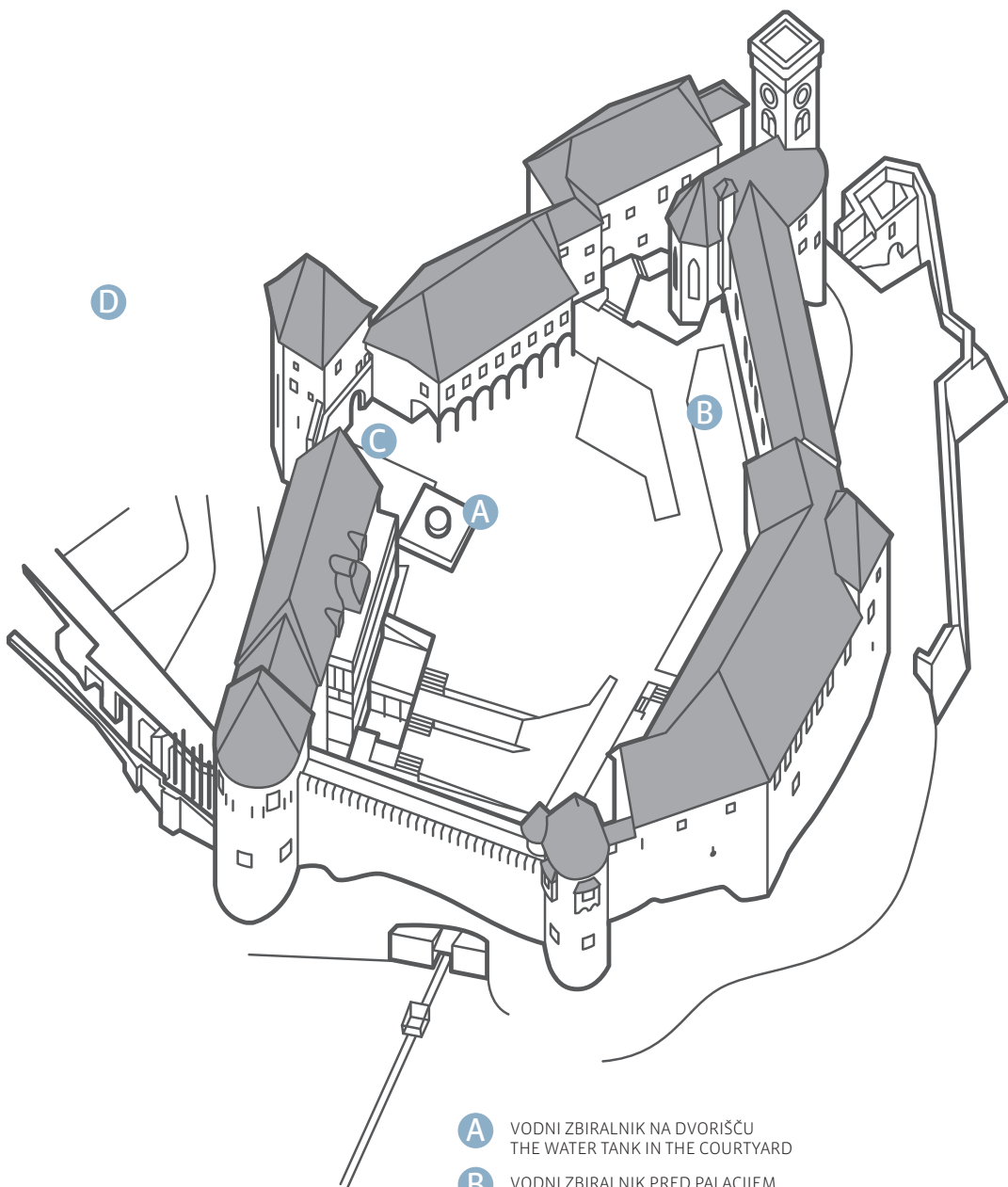
## Water on the Castle Hill

In the broader environs of the castle, one can find even more wells, reservoirs and springs. The two wells in the areas known as Šance and Osoje more or less belong to the castle. Slightly lower, beside the Sodarski Path, there is a spring that leads from St Florian's Church to what used to be the executioner's house beneath Šance, within the former city walls.

### The Executioner's Abode

*Although the profession of executioner was an essential and integral part of late medieval society, it was nonetheless regarded as an undesirable profession, and the executioner was always someone whom people kept at a distance and avoided. In order to remove him from the sight of the citizens as much as possible, the city authorities found him a new abode on what is today the Sodarski Path, which at that time was regarded as a remote and shabby city quarter. Prior to that, he had lived in an even more remote settlement between the Castle Hill and Golovec, but in 1772 he had to move when construction on the Gruber Channel commenced. The executioner's house was apparently destroyed in 1809 during conflicts between the French and the Austrians, after which the then executioner resettled in the Koroška region.*

Almost every residential building in the Reber area of the Castle Hill had its own well or reservoir in the cellar. Unfortunately, despite the warnings of geologists, during construction of the road tunnel beneath the castle in 1952, the impervious layer of stone at the bottom of the folds of earth under the hill were penetrated, and the water that had accumulated in it for millennia was drained off. At that time, many water sources in Old Ljubljana dried up, and the drying of the layers of earth caused erosion and cracks in buildings.



- A** VODNI ZBIRALNIK NA DVORIŠČU  
THE WATER TANK IN THE COURTYARD
- B** VODNI ZBIRALNIK PRED PALACIJEM  
THE WATER TANK IN FRONT OF THE PALATIUM
- C** VODNJAK PRED PETEROKOTNIM STOLPOM  
THE WELL IN FRONT OF THE PENTAGONAL TOWER
- D** VODNJAK S POHODNIM GONILNIM KOLESOM PRED LJUBLJANSKIM GRADOM  
THE WELL WITH A WALKING DRIVE WHEEL IN FRONT OF THE LJUBLJANA CASTLE

#### **Kolofon/Colophon**

*Avtor/Author:*

**Dušan Kramberger**

*Strokovni pregled/Expert Review:*

**Martin Horvat, Irena Vesel**

*Uredil/Editor:*

**Marko Brunskole**

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Vodni zbiralnik na dvorišču/The water tank in the courtyard (foto/photo: Miha Mally)

Vodni zbiralnik na dvorišču, 60. leta 20. stoletja/The water tank in the courtyard in the 1960s (vir/source: ZVKDS, OE LJ)



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