

Monte Cassino: Geology and War*

Wes Gibbons 2018

The town of Cassino, in the province of Frosinone, Italy, is easily reached by car or train from Rome. The setting is scenically and geologically interesting, and the food and wine are excellent, but most visitors come for the WWII history associated with the adjacent hill and abbey of Monte Cassino. A series of battles here in January to May 1944, with Allied troops attacking the well-defended German Gustav Line, left an estimated 75,000 casualties. This guide integrates aspects of the geology, scenery and war history and describes a route through the area with 10 stops which can be completed in a short visit (2 or 3 nights). The route is easiest done by car, but if a full two days are available and you are reasonably fit, then almost everywhere can be reached by using local buses and walking (offering the opportunity to walk the entire 2-hour "Cavendish Road" backcountry military route to the village of Caira in attractive mountainous scenery behind the abbey). For a timeline detailing events in the battle see: https://ww2db.com/battle_spec.php?battle_id=312.

Logistics

Non-Italians travelling to Cassino by public transport from Rome airport can buy a return ticket at Fiumicino Airport for around 22 euros each way (April 2018), using the Leonardo Express train to Roma Termini and changing to the Cassino train. The journey takes about 3 hours: allow extra time for train delays on the return journey to the airport. Once in Cassino there are various accommodation options: somewhere in the centre or west of town would be best positioned for the Archaeological Museum, Commonwealth Cemetery, and the bus station at Piazza San Benedetto. We stayed in La Residenza di Carolina, which was excellent. Mastrantoni buses to Caira (small white bus number 15) leave irregularly around 15 times a day from Piazza San Benedetto. They arrive in the village, pass the Bar Centrale and then turn around and return immediately (<http://comunicacity.net/cassino/orari-autolinee-urbane/mastrantoni-bus/>).

One way to complete the route without a car in two days is to start with the Archaeology Museum (stop 9) then walk down to the Commonwealth Cemetery (stop 10) then back into town to take the 14.00 (April 2018) No. 15 bus from the bus station to Caira (Stop 4), walk to the German Cemetery (Stop 3) then on down to the Rapido River (Stop 2) which can be followed downstream for 2 hours back to town on the cycle/footpath running down the left bank. On the second day take one of the two morning No. 16 buses (09.55 or 12.30 in April 2018) up to visit Monte Cassino Abbey (Stop 6), walk down to the Polish Cemetery (Stop 7) and then follow the signposted track around the southern end of Snakeshead Ridge and Point 593 to the Polish Tank Monument (Stop 8) and on down the steep path ("Cavendish Road") to Caira to catch a bus back to town around 17.50 (April 2018).

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The Battle of Monte Cassino: a brief overview

Following the Allied landings in Sicily and the southern Italian mainland in July and September of 1943, a series of hard-fought battles took place, with the Germans making a planned withdrawal to a series of defensive positions which ran across Italy coast-to-coast north of Naples. This was where the Germans had decided to stop their planned retreat and prevent, or at least severely delay, the Allied front reaching Rome during the winter and spring of 1944.

Key to the German defence plan was the so-called the Gustav Line, which ran through the town of Cassino where defending troops had the advantage of a steep hill (Monte Cassino) guarding the approaches to valley ground with difficult river crossings. Fighting in the Cassino area started on 20 January with an assault by British and US troops firstly to the south (which failed) then to the north of the town (near the village of Cairra), with French Expeditionary forces attacking in the mountains further north. After a tremendous and long-drawn out fight US troops finally fought their way up through the hills south of Cairra and reached the Monte Cassino abbey but failed to take it and were withdrawn on 11 February.

The US troops were replaced by New Zealand and Indian soldiers, and the second phase of the battle began, starting on 15 February with the destruction by massive bombing of both Cassino and the abbey. This was a highly controversial military move, even at the time, especially given the cultural value of the abbey which was founded in the 6th century. German troops, who had agreed not to use the undamaged abbey, immediately occupied the ruins which made an excellent defensive position. The new Allied troops again attacked the hills from the northeast, moving south towards the abbey, while a contingent of Maori soldiers simultaneously attacked Cassino from the southeast. This renewed attack also failed, with the troops being withdrawn on 18 February.

The third phase of the battle was delayed by bad weather but finally began with a bombardment on 15 March, after which Allied troops once again moved into the hills from the north but were again held back by the German defence in a stalemate and were withdrawn on 23 March. The fourth attack began on the night of 11-12 May and involved American, British, French, New Zealander, Polish and South African troops. This time the river crossings succeeded, while in the hills around Monte Cassino Polish soldiers were engaged in a ferocious assault which initially failed but, after a renewed attempt, finally took the abbey on 17 May as the Germans withdrew to positions further north.

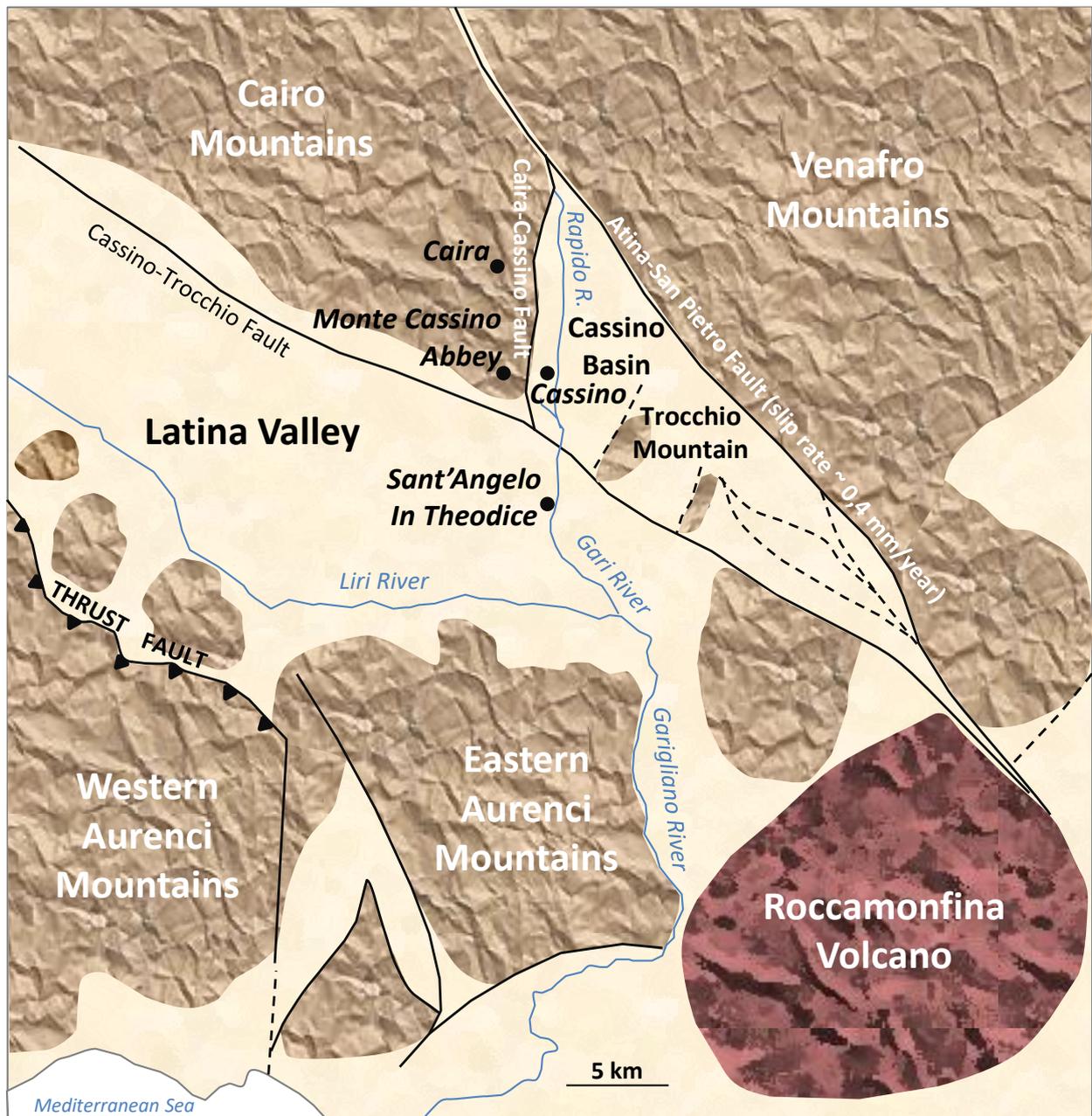


Monte Cassino



Geological setting

The simplified map below shows the geomorphology of the area, with the town of Cassino built on low-lying ground in the Cassino Basin overlooked by mountains on which the abbey of Monte Cassino is built. The Cassino Basin is a small side valley bounded by geological faults and drained by the Rapido River which joins the Gari River and runs south to merge into the Latina Valley: the route northwest to Rome. The military task of the Allied Troops in early 1944 was to enter the Latina Valley from the southeast and break through the German line of defence running through Cassino west of the rivers.



-  Roccamonfina Volcano (Pleistocene)
-  Limestone Mountains (Triassic-Miocene)

The Latina Valley and Cassino Basin originally were coastal inlets but they became blocked by the Roccamonfina Volcano to create an ancient "Lirino Lake" that gradually filled with silt, mud and volcanic ash 480-150 thousand years ago before becoming covered by alluvial river deposits.



The Route

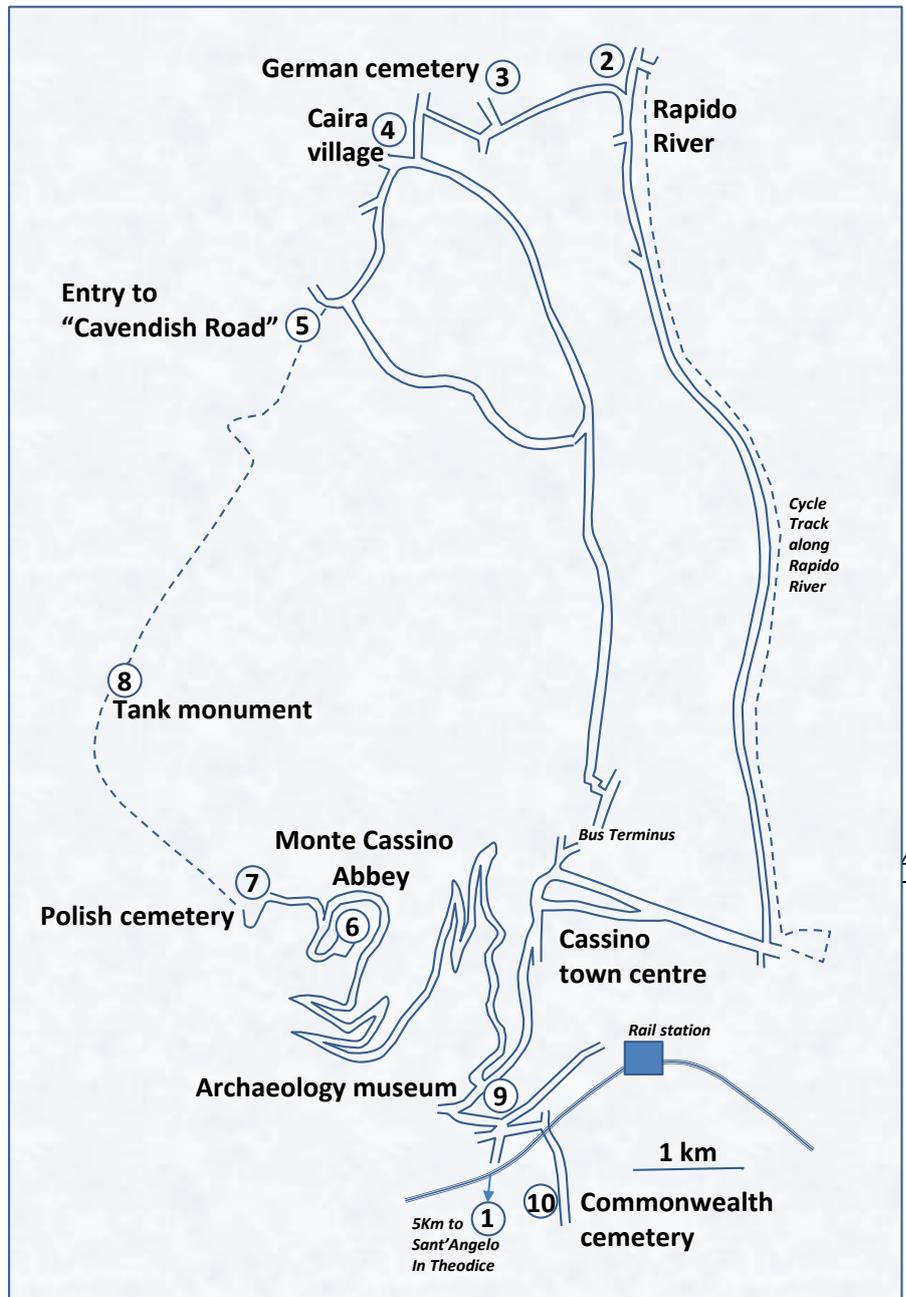
The route description given below visits 10 areas which provide insight into the battles that took place, starting south of Cassino then moving north to the Caira area before climbing to the high ground around the abbey.

1. Defending on travertine: Sant'Angelo in Theodice

Drive to Sant'Angelo in Theodice, 5km south of Cassino, and locate the road bridge over the Gari River (which sources in Cassino). The first WWII attack close to Cassino occurred here during the cold evening of 20 January 1944 when US troops attempted to cross the swollen Gari River from the east. Travertine deposits of Pleistocene age and around 15m thick occur to the west of the river, providing higher and more solid ground that gave clear advantage to the German defenders. In contrast the Allied attackers had to cross

flat, partially flooded muddy ground underlain by soft alluvium before reaching the deep, swiftly-flowing Gari River heavily defended by the German positions. The result after two days of intense fighting was a disastrous failure for the Americans, leaving what in some estimates were over 2,000 troops killed, wounded and missing (<http://www.dtic.mil/dtic/tr/fulltext/u2/a165905.pdf>). The conduct of the army during this fight across the Gari River (sometimes confusingly called the "Rapido") came under a congressional enquiry after the war.

A later attempt to cross the river here, this time including British and Indian troops aided by a Canadian tank division (tank support had been sorely lacking in the previous attempt) in the fourth and final battle for Cassino (11-12 May 1944), was successful. A peace bell commemorating the site can be visited on the east side of the river below the village.





Italian travertine has been used extensively in the area, not only in recent monuments (left: entrance to the Commonwealth Cemetery) but also by the Romans (right: local travertine used in Ionic capital from 1st century BC). Travertine is limestone made of calcium carbonate (CaCO_3) precipitated from alkaline mineral springs: as the waters emerge they lose CO_2 which makes them more acidic which in turn lowers CaCO_3 solubility and precipitates the carbonate which hardens into rock.

2. Crossing the flooded Rapido River

Drive back to Cassino and then east through the town centre on the Via Enrico de Nicola to turn left just before the bridge over the Rapido River, which drains south on the east side of town. Drive up the narrow lane that runs along the western side of the river, with views left to the ridge capped by Monte Cassino Abbey.

The isolated nature of the Cassino Basin within the limestone mountains of the Southern Apennines becomes apparent as one moves north. There is high ground to the east, west, and north, all draining into the low ground containing the Rapido River. The abrupt rise in gradient from the sedimentary basin against the bordering mountains is due to the presence of two young faults (the Atina-San Pietro Fault to the east, and the Caira-Cassino Fault to the west) which control the position of the mountain front. Earthquakes are relatively common in the Southern Apennines, with the largest on record being that in 1329, which devastated Cassino. The fact that this part of Italy is still very much tectonically active gives the landscape a youthful character, with sudden, steep mountain gradients across active faults bordering flat basins partially filled with alluvial and lake sediments across which rapidly draining rivers swollen by winter rain and spring meltwater run over their boggy floodplains. It all makes for excellent defensive terrain, an observation not lost on Albert Kesselring, commander of the German forces holding the Gustav Line which ran coast to coast across Italy and was anchored in Monte Cassino and along the Caira-Cassino Fault.

Continue following the river upstream. Around 5km north of Cassino you arrive at a left fork (Via Case Nuove: sign to German Cemetery) that leads west towards the village of Caira. Park here at the fork or at the river bridge ahead on the right and contemplate the setting for the military attack by US troops on the Gustav Line which started on 24 January 1944. This was another difficult offensive, inhibited by wet low ground (deliberately flooded by the Germans who destroyed a dam upstream in Sant'Elia) on either side of the Rapido River. Despite this and other obstacles (such as crossing the river itself then having to pass heavily mined ground on the west side) after 8 days of fighting the surviving Germans had been pushed back from the Gustav Line and into the mountains.





View SW towards Monte Cassino Abbey from the cycle path on the left (eastern) bank of the Rapido River. The sudden change in slope from valley floor to mountain side marks the position of the Caira-Cassino Fault. The flat ground on either side of the river is underlain by soft, slippery Pleistocene lake sediments and volcanic deposits covered by river alluvium: difficult terrain for heavy vehicles.

3. German Cemetery: the Gustav Line.

Drive west along the Via Case Nuove for nearly 1km and turn right to reach the German Cemetery. After visiting the information room on the left, and being warned about the presence of poisonous snakes, enter the site to climb through the low-maintenance (but very attractive) gardens to the travertine entrance building through which you climb to access the graveyard where over 20,000 German soldiers are buried. The site is impressive in its design which enhances the natural beauty of its position on the Gustav Line overlooking the Rapido River valley, and creates an introspective atmosphere that encourages a non-jingoistic consideration of the horrors of war for the individual soldier. Some of the graves are anonymously marked: *Ein Deutscher Soldat* (<https://www.tracesofwar.com/sights/1191/German-War-Cemetery-Cassino.htm>).





The German cemetery lies on a hill just outside the village of Caira, on the sloping ground of the Gustav Line bordering the Rapido River floodplain.

4. Caira: springboard for attack.

Continue west along Via Case Nuove, passing the Piazza Marino Fardelli, to turn right into Via Toselli Saragosa, at the end of which turn left to reach Corso San Basilio in the centre of Caira village. Refreshments can be enjoyed in the Bar Centrale (on the right). The valleys and ridges south and west of Caira offered a back route into the hills to the north of Monte Cassino, and the hills around this village were attacked in all four phases of the battle. The bedrock of these hills and mountains is a hard, pale Mesozoic limestone with strata dipping southeast into the Rapido Valley, cut by numerous faults and dissected by deep valleys and rocky ridges and ravines. The tendency for the limestone to shatter into sharp fragments in response to the impact of explosive shells added another hazard to the foot soldier trying to storm this difficult higher ground.

5. The Cavendish Road.

From Bar Centrale head south for 800m on Via Cavatelle to turn right into Via Monacato and park in 100m at the signposted start to the track up to Monte Cassino. The stated time of 2hr 20minutes for the walk to the abbey applies only to the fit and determined optimist: it is a long climb. At the start of the Battle of Monte Cassino this was an old mule track which was upgraded in March 1944 by Indian and New Zealand engineers working under an officer of the 4th (Indian) Division named Lt-Col E.E. Stenhouse DSO who named it Cavendish Road after the street in Bournemouth where his father lived. The upgrade succeeded (incredibly) in allowing tanks to reach the higher ground behind the abbey. After an armoured attack by American, Indian and New Zealand forces on 19 March, which failed due to the lack of supporting infantry, Polish engineers restored the track, renaming it *Droga Polskich Saperów* ("Street of the Polish Sappers"), in preparation for their own attack on the abbey in May.





The Cavendish Road today is a mountain walking track that gives little hint of its violent past, running below exposures of white limestone (left) that form mountains that rise to the peak of Monte Cairo (1,669m) 5km from Monte Cassino. Lower Right Photo: view from the track down to the village of Caira and the northern closure of the Cassino Basin.

6. Monte Cassino Abbey.

Drive back to Cassino and take the twisting road (SR149) for 8km to the abbey above, now completely restored since its destruction in 1944: *Com'era, dov'era* ("How it was, where it was").





The abbey houses an extensive museum which is worth a visit and offers views out across the surrounding countryside.



View from the abbey museum out over the Polish cemetery (left) and the 1,669m-high limestone peak of Monte Cairo (right). The lower central hill of Monte Calvario (also known as Point 593) and the ridge running from it to the right (Snakeshead Ridge) was the site of especially fierce fighting and is capped by a monument commemorating the men of the Polish 3rd Carpathian Infantry Division (2nd Polish Corps) who took the hill in May 1944 during the final battle for the abbey ruins. The wooded “dip slope” follows the line of the southeasterly inclination of the limestone layers, with the ridge ending in a steeper “scarp slope” (note a similar shape to Monte Cairo). The underlying geological structure strongly influences the shape of the land surface.

Monte Cassino

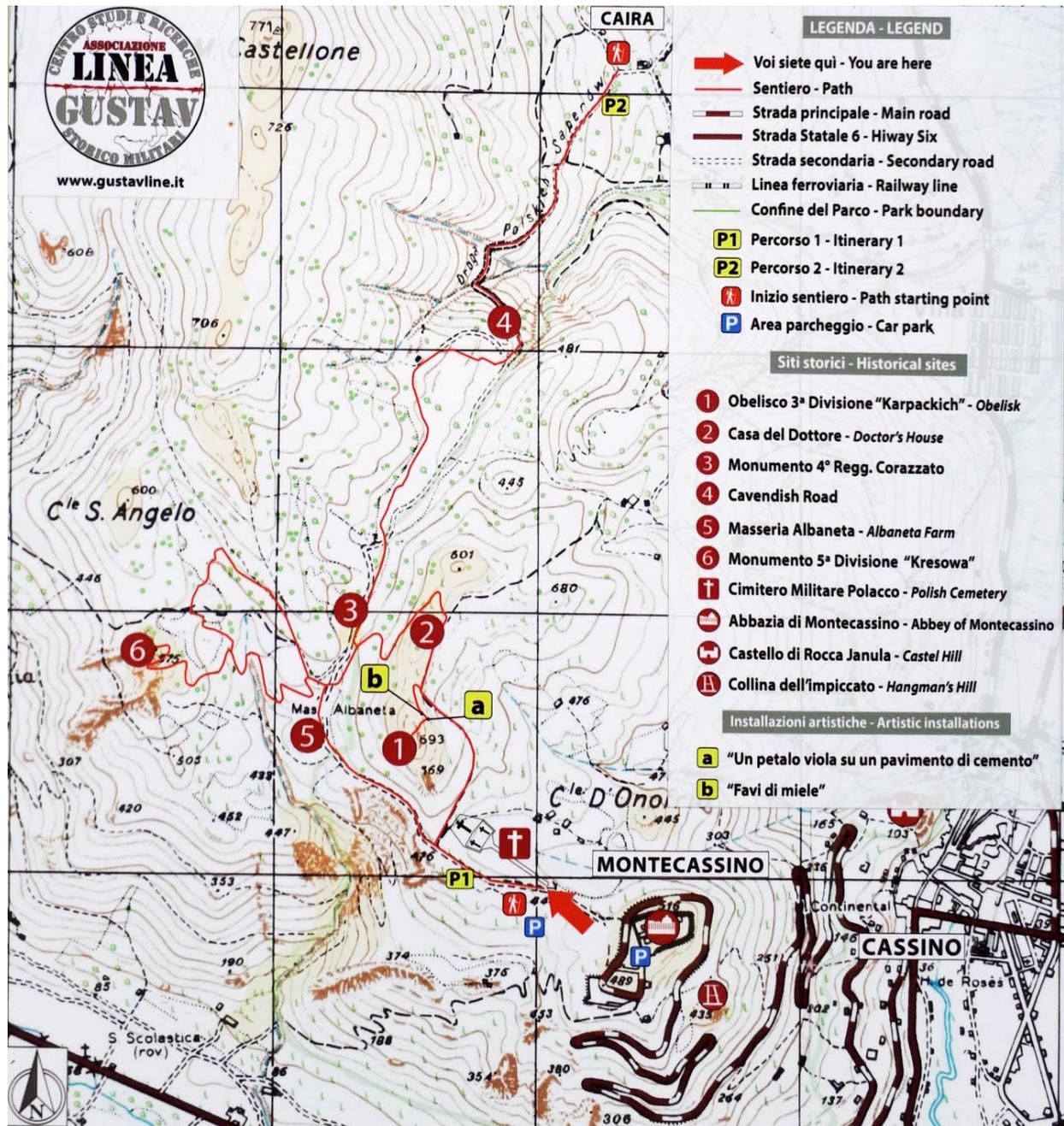


7. Polish Cemetery.

Drive or walk to the Polish cemetery which lies 500m northwest of the Abbey. Over 1,000 men are buried here, the entrance gates having the following inscription:

"We Polish soldiers, for our freedom and yours, have given our souls to God, our bodies to the soil of Italy, and our hearts to Poland."

8. Tank Monument.



From the Polish Cemetery car park a path (guided by red and white painted markers) runs northwest across the heavily contested ground between the abbey and the top of the Cavendish Road, passing military monuments, limestone caves used by German soldiers for shelter and storage, and ruined buildings destroyed by the fighting (e.g. Albaneta Farm).



Follow the track northwest from the cemetery, climbing gently up the limestone dip slope then descend around the southern end of “Snakeshead Ridge” (a path leads off right to the obelisk capping Monte Calvario, Point 593). Immediately to the left (southwest) of the track the ground drops precipitously nearly 500m over the escarpment of the Cassino-Trocchio Fault into the Latina Valley below: the route to Rome. Around one kilometre from the cemetery the path turns north and forks right to reach (after a few hundred metres) a Sherman tank converted into a memorial to the Polish troops who lost their lives fighting here.



Sherman tank knocked out of action by mines during the final battle for Monte Cassino, fought by troops of the 4th Polish Armoured Regiment. The track links of the tank have been welded to form a cross. The memorial lies 1,500m northwest of Monte Cassino Abbey, on the other side of Monte Calvario and Snakeshead Ridge, on the southern edge of an area of relatively flat ground at the top of the Cavendish Road and called the “Madras Circus” by the troops.

From here the “glorious wild” path continues north into “Death Valley”, following the old Cavendish Road which descends increasingly steeply to the road south of Caira (see stop 5 above) but be warned that the track requires good footwear, good weather and passes through wild boar country. Buses can be taken from Caira back to Cassino (see Logistics section).

9. Cassino Archaeological Museum.

This museum lies just above the town of Cassino, at the last hairpin bend in the road descending from the Abbey. The outdoor part of the museum excellently preserves various Roman remains such as the theatre, amphitheatre, Roman road (Via Latina) and the lapidarium. The museum lies on the trace of the Caira-Cassino fault which runs through the site, creating a sudden change in ground slope and



defining the edge of the Cassino Basin. Although relatively well preserved, the site did not escape the intense WWII fighting and bombing, as damage to many surfaces testifies: examine, for example, the floor of the Ummidia Quadratilla Tomb.



Roman Road and Amphitheatre at the Cassino Archeological Museum, with views over the rebuilt town from the escarpment of the Caira-Cassino Fault.



Despite the bombardment of Cassino in WWII and the heavy fighting between German and Allied troops in the ruins of the town, something still remains of the Christian church and former Roman Mausoleum (the domed Ummidia Quadratilla Tomb) found standing in the grounds of the Archaeological Museum.



10. Commonwealth Cemetery.

The itinerary ends with a visit to the Casino Commonwealth Cemetery, on the road to the University just south of town. Drive or walk southwest then east from the Archaeological Museum around the amphitheatre site to cross the main road (SR6) and continue east then south over the railway to the cemetery.



Cassino Commonwealth Cemetery. More than 4,000 soldiers from Canada, India, New Zealand, South Africa and the United Kingdom are commemorated here, overlooked by the high ground of Monte Cassino and its abbey.

The cemetery lies close to the Gari River on gently rising ground where river alluvium gives way to deposits of travertine south of the river. The travertine underneath the cemetery probably owes its origin to Pleistocene springs emerging from the Cassino-Trocchio Fault which forms the steep southwest boundary of Monte Cassino (left side of photo) and runs out beneath the low ground of the Cassino Basin. The abrupt changes in slope due to the bounding Cassino-Trocchio Fault (left) and Caira-Cassino Fault (right) has produced one of the best defensive promontories in Italy, overlooking the road to Rome. It has been capped by an abbey for around 1,500 years since the days of Saint Benedict, one of the patron saints of Europe.....



Epilogue: stories from the footsoldiers.

My uncle, Henry Gibbons, fought in the battle of Monte Cassino. He was attached to the 5th (Huntingdonshire) Battalion, Northamptonshire Regiment in the 11th Infantry Brigade of the 78th "Battleaxe" Infantry Division, a unit that also included Albert Clements, Ivor Cutler, John Dove, John Dray, William Arthur Griffiths, and John Granville Warner (known as Jack). The regiment had left Sicily on 14 August 1943, moved up the northeast coast of Italy, and found itself stationed in Cassino witnessing the bombing of the town and abbey on 15 March 1944. Their planned task was to force a river crossing after the Indian/New Zealander offensive in the second phase of the battle:

On the 15th March the Battalion was summoned to an address by the Commanding Officer. "Der Tag" had arrived and that morning the bombing would start. Soberly and with full realisation of the importance of the task that lay ahead the Battalion prepared to move forward. Meanwhile the first wave of bombers appeared flying high above Cassino. They circled lazily over the town like little silver insects. Those of us who were watching saw small black shapes detach themselves from the bellies of the planes and go screaming down into the embattled town exploding one after another with an overlapping series of angry crumps. The attack was on. For three hours, wave after wave of planes came over, jettisoned their deadly cargoes and turned for home. It was an awe-inspiring sight. The fact that we human beings were cowering under that colossal weight of bursting red-hot metal ceased to exist. The fact that we were human beings ourselves also ceased to exist. Individual personalities were at a discount. We were all mechanical cogs of a mighty inexorable machine that was driving us on to an unknown future over which we had no control. Just before the bombing ended the Battalion moved forward into the assembly area, a procedure that was enlivened by odd enemy shells. Once established, companies carried out last-minute preparations and sat down to watch and wait. Conflicting reports began to drift in from Cassino. The New Zealanders were through the town. The New Zealanders had been driven out of the town. The Indians had captured the Monastery. The Indians had been cut to pieces. From this jigsaw of reports and rumours the picture slowly pieced itself together. The attack was not meeting with the success anticipated. Although fighting with superb heroism the New Zealanders and Indians were finding Heindrich's parachutists a tough proposition. Well dug in with carefully-sited machine guns the Germans were hitting back with ferocious fanaticism, seemingly unshaken by the bombing. After several days it became apparent that the attack was petering out after having gained a few yards of blood-soaked ground. Meanwhile the Battalion remained in a state of readiness. Despite the fact that a few thousand yards away raged a mighty battle, conditions in the Battalion's area were quiet. Enemy shelling was sporadic and caused little damage.... It was now quite obvious that we would not be required to cross the Rapido and after over a week in the assembly area the Battalion moved back to Mignano preparatory to the relief by 78 Division of an Indian division in the mountains between the Monastery and Monte Cairo. (Recollections of Ivor Cutler, 5th Northamptonshire Regiment: <http://www.montecassinosociety.co.uk/index.php/recollections/5-ivor-cutler>).

On the evening of 24 March the Northamptonshire Regiment was sent north, passing Caira village and climbing into the hills with their kit on pack-mules. Reaching the upper ground safely, their new job was to fight the Germans occupying the area around the abbey.

Everywhere the ground was stony and bare. Digging was impossible (and)... the enemy was able to employ snipers with good effect. The slightest movement on the part of anyone occupying a Sanger (stone shelter) was greeted by a sniper's bullet. In consequence it was soon learned that during daylight



it was essential to remain under cover. Look-outs had to be alert, however, as the enemy was only 90 yards away. Periscopes were used, but were often spotted by snipers and their positions frequently had to be changed. Conditions in these forward Sangars can be imagined. Nothing other than tea boiled over Tommy cookers could be taken hot. Haversack rations were the order of the day.... Rats infested the area and could be heard at night tearing at the bodies lying around. As the weather grew warmer so the stench increased and the flies grew more prolific....

Manning their "Sangars" day and night with the same area of ground always facing them they were holding out stubbornly against the enemy's bullets and bombs. The sense of nearness to the enemy was very acute. In the darkness a displaced stone would make a noise out of all proportion to the quietness of the night. Numerous cans were strewn about which, when accidentally kicked, caused a salvo of mortar bombs to come over. Between the lines lay innumerable bodies – those of English, Indian, American and German soldiers who had fallen in the close fighting of the past months. They lay in the open as it was impossible to get at them. At night time some of them were covered up with stones after putting a blanket, lime and creosote on them to hasten decomposition. Graves were quite out of the question (Ivor Cutler).

Henry Gibbons' sister-in-law (Peggy Gibbons) later wrote: *Henry and his group were attacking one of the hills surrounding Monte Cassino at the top of which was the Benedictine Monastery defended by a machine gun post as was the high point of the surrounding hills....Henry's mule and all his equipment were blown up...*

The mules were essential for bringing supplies to the troops on the hills and, like the men, suffered many casualties: *One night nearly 40 (mules) were killed in a field ..., the arrangement made to keep them forward immediately cancelled in view of this. Mules are expensive animals. They take 3 years to become efficient pack animals (Ivor Cutler).*

The relief of the Northamptonshire battalion finally took place on the night of the 25 April when the British troops were replaced by the Poles who were to make the final assault on the abbey. The next battle for the Northamptonshire men was to start on the 14 May during the final assault on the Gustav Line and this was followed by fighting down the Latina Valley on the road to Rome which was entered by Allied troops on 5 June 1944. The troops of the Northamptonshire Battalion were among those passing through the city: *In the bright moonlight Rome was a grand sight. Its buildings showed large in the wide tree-lined streets and regret was felt when the dome of St Peters faded into the southern background (Ivor Cutler).*

By June 15th the Northamptonshires were in Orvieto, an historic town 120km north of Rome and spared from destruction by the acceptance of an offer made from the German Commander to the invading British Major Richard Heseltine. The Germans would pull back to the villages further north and leave Orvieto open to the Allied troops.





The hilltop town of Orvieto, viewed from the local WWII cemetery that lies to the east. The unusual hilltop scenery of the town, originally built by the Etruscans in the 8th century BC, is due to it being an erosional remnant of a plateau produced during Pleistocene volcanic eruptions and deposition of pyroclastic flows. It was an obvious defensive position for the German army, but agreement was reached that spared its destruction.

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At 04.00 in the morning of June 16th the battalion moved north through Ficulle and Faiolo and, at 13.30, became engaged in a battle for the village of Montegabbione

(http://www.montegabbione.net/battaglia_16-06-1944_EN.html): *Against stiff opposition the Northampton's pressed home their attack which the divisional historian described as 'one of the best actions ever fought by the battalion'. The attack showed considerable skill on the part of the Northampton's officers, especially the junior officers. When the leading company -A- met heavy rifle fire the company commander left one platoon behind to provide fire support while the other two were directed on the school and a large building to its right. Both objectives were taken although the victors were subjected to several hours of fierce fire from nearby buildings. C Company also fought its way into the town and S Company's commander directed fire from Wiltshire Shermans on to buildings still occupied by the enemy. Unusually, there were no counter-attacks. The Germans pulled out during the night leaving the Northampton's in possession (from: Doherty, Richard, "Eighth Army in Italy 1943-45 The Long Hard Slog", Barnsley, Pen & Sword Military, 2007).*

One of the Northamptonshire men in the fight at Montegabbione was John Dray: *This was the location of one of John's toughest battles, fought here in June 1944 after the breakout from the Liri Valley. His battalion, with tank support from the Wiltshire Yeomanry, was given the task of clearing the village, which sat on top of a small hill. The men became bogged down in a firefight in the village, and when John went up they were making their way below the village walls when a sniper killed his mate Jack Warner* (http://battlefieldsww2.50megs.com/italy_diary_2004.htm).



<http://barcelonatimetraveller.com/>

Henry Gibbons, having survived Monte Cassino, was also killed in this fight in Montegabbione. Peggy Gibbons wrote: *Henry's wife Gwen had a letter from Henry's officer in charge of the attack up the hill. It appears Henry was shot in the mouth and fell; his best mate rushed over to help him and had Henry over his shoulder when the Germans machine gunned the pair of them. Henry was 23 years old and had a baby girl called Angela whom he had never seen.*

Henry was buried in the Orvieto war cemetery, flanked by four of his fellow soldiers from the Northamptonshire Regiment who also died that day in Montegabbione: Albert Clements, John Dove, William Arthur Griffiths, and John Granville Warner (known as Jack).

16 June Montegabbione					
CLEMENTS, ALBERT	Private	5892137	5 Northamptonshire Regiment	22	Friskney, Lincs.
DOVE, JOHN	Private	5891930	5 Northamptonshire Regiment	21	Northampton
GIBBONS, HENRY	Private	6013229	5 Northamptonshire Regiment	23	Stowbridge, Norfolk
GRIFFITHS, WILLIAM ARTHUR	Private	5890456	5 Northamptonshire Regiment	31	Enfield, Middlesex
WINSHIP, THOMAS WILLIAM HENRY	Private	996606	5 Northamptonshire Regiment	29	West Hartlepool, Co. Durham
WARNER, JOHN GRANVILLE	Private	14331593	5 Northamptonshire Regiment		Unknown
MATTINSON, MICHAEL CORBETT PETER	Lieutenant	121310	5 Northants Regt/ Royal Warwicks. Regt.	25	Offchurch, Warwickshire
ABRAM, WILLOUGHBY HARVEY	Lieutenant	166297	Warwickshire Yeomanry RAC.	24	Acton, Middlesex
RILEY, HOWARD GORDON	Captain	179915	3 King's Own Hussars	23	Unknown
CHITTOCK, WALTER JAMES	Private	5892137	Royal Wiltshire Yeomanry	22	Norwich

From the Orvieto War Cemetery register (<https://orvietowarcemetery.weebly.com/the-fallen.html>).



Monte Cassino



References for further reading

In addition to the website links given in the text, the reader may wish to read to the following references:

1. Ciciarelli, J. A. 1994. The Geology of the Battle of Monte Cassino. *Journal of Geological Education* 44, 32–42. https://link.springer.com/chapter/10.1007%2F978-94-017-1550-8_19

Review from <https://www.uvm.edu/~pbierman/classes/gradsem/1999/knbib.html>:

Ciciarelli does a good job of explaining the topographic and geologic layout of the terrain surrounding Monte Cassino. It is clear from the text that allied forces had no other topographic choice but to go through Cassino. The Germans used the geology to their advantage to bog down the heavy equipment and turn the Americans into foot soldiers. Even past land management issues are discussed as they pertain to bare bedrock. When enemy fire hit the bare rock, it would fracture and cause an increase of 50% more eye and head injuries than normal battles. This article is historically interesting and shows the significance that geology can play in battle. Geology alone can be an obstacle but when enemy forces use it effectively to their advantage, there can be no defense against it (except perseverance and lots of men).

2. Saroli et al., 2014, New Geological Data on the Cassino Intermontane Basin basin, central Apennines, Italy. *Rend. Fis. Acc. Lincei*, 25, 189-196. http://www.academia.edu/13569335/New_geological_data_on_the_Cassino_intermontane_basin_central_Apennines_Italy
3. Video: <https://www.youtube.com/watch?v=azlV7z955qk>



Background to Holiday Geology Guides

The author and geologist Wes Gibbons has always had an interest in writing short geoguides aimed at inquisitive tourists, offering them the opportunity to learn about the landscapes and rocks of scenically attractive places. His argument is that there is so much more to know about rocks and Earth history than the superficial descriptions offered by tourist guidebooks, which rarely even scratch the surface of Deep Time. This guide to Monte Cassino is obviously much more about WWII history than geology, although in any land battle the rocks will shape the scenery, influence ground conditions, and so always play a role.

His first attempt in the geoguide direction produced *The Rocks of Sark* (1975), published jointly with John Renouf of Manche Technical Supplies in Jersey, a venture that taught a youthful Wes to always be the one responsible for the final proof reading. In 1976 Wes moved from Sark to begin a PhD supervised by Greg Power (Portsmouth University) and Tony Reedman (British Geological Survey). Living in a former Post Office in the village of Greatham on the Hampshire-West Sussex border, Wes decided to pass his spare time preparing a guide to the geology of the Weald in southeast England. He sold the idea to the publishers Allen and Unwin who commissioned other authors to develop a mini-series: *The Weald* (1981), *Snowdonia* (1981), *Lake District* (1982), and *Peak District* (1982).

His next field-based guidebook surfaced in 1985, fruit of several years research work in Corsica (*Corsican Geology: a field guidebook* by Gibbons and Horák). Two years later Wes launched the Holiday Geology series, using a simple, inexpensive format later described as “a single A3 laminated sheet folded into three and (with).. six portrait panels ... filled with a lively mix of colour photos, maps, sections and text” (review by Nigel Woodcock in *Geological Magazine*, 2000). The first two Holiday Geology guides were *Scenery and Geology around Beer and Seaton* (Wes Gibbons 1987) and *Rocks and Fossils around Lyme Regis* (Wes Gibbons 1988). The Holiday Geology concept attracted the attention of the British Geological Survey who went on to ¹⁹ expand the series to over 20 titles.

Following his retirement in 2004 to live in Barcelona with Teresa Moreno, Wes maintained his interest in publishing field guides by writing the text to *Field Excursion from Central Chile to the Atacama Desert* (Gibbons and Moreno 2007), *The Geology of Barcelona: an Urban Excursion Guide* (Gibbons and Moreno 2012), and *Field Geotraverse, Geoparks and Geomuseums* (in central and southwest Japan: Gibbons, Moreno and Kojima 2016). His most recent publishing project, the most ambitious so far aimed at a general readership, has produced the book *Barcelona Time Traveller: Twelve Tales* (2016, Spanish translation 2017: Bimón Press Barcelona) and the resurgence of the Holiday Geology concept, although this time in virtual format linked to the *Barcelona Time Traveller* webpage.

Wes Gibbons, May 2018

<http://barcelonatimetraveller.com/>

