

Subterranea

September 2004

Issue 5



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Tunnels**

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Square leg**

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Bunkers**

**Books, News
and Reviews**

**A new section is now online at
www.subbrit.org.uk
covering non coldwar sites**

Subterranea Britannica is a society devoted to the study of man-made and man-used, underground structures and the archaeology of the Cold War. The main focus of interest is on abandoned and forgotten structures and, in the case of Cold War structures, studies are entirely confined to declassified and decommissioned structures. The society is open to all and its membership includes all walks of life. Members are invited to contribute to this newsletter even if this just means sending very welcome snippets from newspapers and magazines, ideally on a cd or floppy disk.

Editor

Dan McKenzie

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Newsletters of Subterranea Britannica are published by the committee of Subterranea Britannica. Original articles , book reviews, press cuttings, extracts from books and journals, letters to the editor etc. are welcome. However the editor reserves the right not to publish material without giving a reason.

The committee of Subterranea Britannica and the editor do not necessarily agree with any views expressed and cannot check the accuracy of any material sent in.

News

Cathedral's medieval tunnel opens

Thomas Becket was killed at Canterbury in December 1170.

A 15th Century tunnel at Canterbury Cathedral which allows pilgrims to visit the site of the murder of Thomas Becket has been reopened to the public.

The tunnel, which was built around 1420, had been closed for over 40 years and used for storage. It was built to enable 15th Century pilgrims to visit the site without disturbing the cathedral's monks. Canterbury was one of the chief European centres of pilgrimage until the Reformation. Now it has been cleared and reopened, it also gives tantalising new vistas of two central areas

The Very Reverend Robert Willis, Dean of Canterbury, said the tunnel would give proper access to people in wheelchairs to the Martyrdom - one of the most important parts of the Cathedral. "The Cathedral has hundreds of steps which can make life difficult for anyone who finds it hard to climb up and down steps," he said. "Now it has been cleared and reopened, it also gives tantalising new vistas of two central areas of the Cathedral

From BBC News

New tunnel is started at tin mine

Blasting has started at a west Cornwall tin mine with the aim of eventually restarting production.

South Crofty, Europe's last tin mine, closed as a working mine in 1998, bringing to an end a 3,000-year-old tin mining tradition in Cornwall.

The blasting of a new tunnel at the mine - a six-month operation - is to be followed by the "major step" of pumping out the mine, owners Baseresult said. Since its closure, the mine's 300 miles of shafts and tunnels have flooded. "We think this will be a highly profitable operation"

The water, an estimated total of 4.5 million gallons, is at a depth of 700 metres and within 61 metres of the surface. Last October, the mine, parts of which date back to the time of Elizabeth I, opened up as a tourist attraction for the first time,

It has so far attracted 1,500 people, who have been able to penetrate 46 metres into the workings. However, the company which has owned the mine since 1991, Baseresult Holdings Ltd, said it is "two years away from being able to mine and produce tin". It also said it predicted there would be an "80-year life for this mine".

The chairman and technical director of owners Baseresult, David Stone, said: "We think this will be a highly profitable operation." Mr Stone said when pumping began to expose levels of the workings, the firm would be able to mine tin. Baseresult said: "It is a very exciting step forward and represents yet more evidence of our absolute determination

From BBC News

Nuclear bunker for sale

The following appears on 'The Independent' web site

Get away from it all: Nuclear bunker for sale, just £250,000 By Ian Herbert, North of England Correspondent 29 July 2004

For the housebuyer in search of rural seclusion, protection from power cuts and burglars and a phone line for all who visit, this is the ideal property The concrete fascia of the 15,000sq ft former nuclear bunker buried in Lancashire lacks rustic charm, and the four huge levers on its steel front door will make heavy work of nipping out to get the milk. But JH Walter, the estate agent trying to sell the building, at Goosnargh, near Preston, says demand for bunkers is buoyant.

They have been converted to observatories, mini-tourist attractions and holiday cottages. Three small bunkers have gone for £10,000 apiece on e-bay in the past six months alone. But Goosnargh is special, say nuclear-bunker anoraks, 300 of whom form one of Britain's more unusual interest groups, Subterranea Britannica.

Under a grass mound behind a hedge on a lane outside the village, the bunker has 50 rooms on two levels, a canteen, decontamination rooms and an air-filtration system. There is also the distinctive Royal Observer Corps standard-issue carpet, cut by an orange line pointing the way out of the maze of meeting rooms, control centres and phone exchanges.

If the bomb was about to go off, Goosnargh would have been the first to know through its sophisticated phone exchange. Upgraded in the 1980s, the exchange maintained contact with 850 monitoring stations across Britain. The lines are all still there, along with the blue bulb whose use was reserved for the moment that all who worked there hoped would never happen. Goosnargh was well equipped for such an apocalypse. Its electricity generation plant, huge water tanks, controlled temperature system and water borehole were improved in the 1980s. Still pristine, they could have kept the place going for weeks. The last staff turned out the lights and retired to the surface in 1992, since when the station has been empty.

Terry Tracey, a bunker station officer in the Cold War, says: "Some of the more well-off former officers have bought their own bunkers but that's not for me. I would like it saved by English Heritage. The way we're going, our children's children are not going to know what the Cold War really was." The bunker is expected to sell for about £250,000.

From The Independent

News

Secret bunker found in the Civic Centre

It's been lying undiscovered beneath Southampton's corridors of power for decades. Now workmen digging beneath the city Civic Centre have stumbled on a secret bomb-proof bunker.

The discovery has stunned archaeologists, who had no idea it existed. Now they are hoping Daily Echo readers will be able to shed some light on the mysterious chamber.

The bunker was unearthed behind a basement wall, during works to upgrade and extend the accommodation for the city's archives

Behind the rusted, blast-proof door, a five-metre corridor leads to a narrow room clad with steel and concrete, and a secret escape hatch even leads to the surface.

It is thought the T-shaped room would have been used as an emergency escape hatch - and council archaeologist Dr Andy Russel even reckons two alcoves would have been used as toilets.

He believes it dates back to the Cold War in the 50s when England was in the grip of fear over a possible Russian invasion.

He believes this is why it appears on none of the original architect's drawings for the Civic Centre, which was built in the early 1930s. If he is right the chamber would have been a top secret bolt-hole for city rulers.

It contained no artefacts, apart from two sand-filled fire buckets, but council officials have been amazed by the discovery.

Dr Russel said: "This is fantastic. It's unique. Everything else in the Civic Centre from that period has been removed and for this to have survived untouched is amazing."

Archaeology enthusiast Audrey Wylie lists it among her top finds.

"We tried to find this before because we had heard rumours about its existence, but never thought it was really here," she said.

Conservation manager Kevin White added: "We'd be very keen to hear from anyone who remembers it and knows exactly what it was used for and when."

By Claire Moriarty

Tempelhof Bunkers

TEMPELHOF, the Berlin airport that Adolf Hitler wanted to place at the centre of his empire, is to be closed by the cash-strapped city. A protest campaign has already begun to save the extraordinary Nazi construction, but the city council argued yesterday that there was no case for keeping the rundown airport alive at a time when libraries and swimming pools were being shut to stave off bankruptcy.

The high ceilings and the smooth lines of the main air-port terminal, dubbed the Clothes Hanger by Berliners because of its arc-like shape, have made Tempelhof the most famous airport in Germany. It has served as the backdrop for films such as Billy Wilder's *A Foreign Affair* and featured in hundreds of Cold War newsreels when it became the major landing point for the Berlin Airlift. It was here, in 1897, that the first German airship crashed, killing its designer; here, too, that in 1909 the Wright Brothers launched the first motorised flight in Germany.

But it was Hitler who gave Tempelhof its real historical significance. He took the Bauhaus-influenced design of Ernst Sagebiel and ordered its conversion into a grand air-port. It was supposed to handle more than six million passengers a year and be part of the Nazi modernisation programme that included auto-bahns and the Volkswagen.

"It has to be the biggest and the most beautiful airport that the world has ever seen," said Hitler, the first European leader to make frequent personal use of air travel. "It will be the centre of a Reich that includes Paris and Moscow and that takes German power to the furthest corner of the globe."

Nowadays barely 400,000 passengers a year use the air-port. Often there are only a handful of propeller-engined aircraft on the field, their destinations mainly small German cities such as Nuremberg.

A proposal by Deutsche BA and Germania to take over some of the losses and keep the airport alive was overruled by the Mayor, Klaus Wowereit, yesterday. "The sums do not add up," he said. Berlin needs the money to convert Schönefeld, formerly East Germany's top airport, into an international terminus capable of handling long-haul flights. "Tempelhof has outlived itself," he said. "If we kept it going until 2010 we would have to reckon with further losses of €120 million."

The airport has an empty, eerie feel: footsteps echo on the floor where Hitler used to stride towards his aircraft. The massive scale of the Nazi architecture — the restaurant was built to house 3,000 diners — provides a stark contrast to trickle of passengers. Underneath the airport is a labyrinth of bunkers and tunnels. The sightseeing platform alone space for 80,000 spectators - intended for crowds cheering the returning Führer.

The architect, Sagebiel, was the protégé of Hermann Goering. Sagebiel won favour because he had constructed airforce ministry, with a roof long enough to provide a landing strip, in two years. Tempelhof was also built quickly although work had to be broken off in 1943 because of a shortage of building materials.

The old airforce ministry, now the Finance Ministry, and the Olympic stadium are only two major pieces of Nazi architecture remaining in Berlin, alongside Tempelhof. If the new owner of Tempelhof

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demolishes it — one idea is to make it into a vast sports complex — there will be little to see of the Third Reich in German capital. The site of Hitler's bunker is deliberately unmarked.

So far German protests are concentrating on keeping Tempelhof jobs rather than the buildings. "But it's only matter of time before some protest organisation tries break the last taboo and lobby for the survival of Nazi buildings," Patrik Schwarz, of I daily *Taz* newspaper, said.
Battle Stations!

RAF Rye Chain Home Station

Sarah O'Grady discovers a wartime gem that requires a buyer with true British grit

Deep in Romney Marsh on the south-eastern tip of England lies a historic remnant of the nation's Second World War defences - a radar station that helped to win the Battle of Britain. Known as RAF Rye Chain Home Station, the installation gave early warning of Luftwaffe attacks, enabling outnumbered Spitfires and Hurricanes to coordinate their response. Six decades after playing such a vital role, the station is to be auctioned. This unique piece of the past, set in a wildlife area, is destined to be redeveloped as a designer home.

Decommissioned in the 1950s and now used as a barn, the property has planning permission for conversion to a large three-bedroom house. Current owners Caroline and Kevin Solly bought the radar station with nearby cottage and three acres of land for 105,000 in 2000. As Romney Marsh is Green Belt land, new development is banned but work is allowed on some existing structures, especially those of historical significance. Planning permission was granted in 2002 for a change of use in a bid to protect the property and safeguard its history.

Harry Woolley, a volunteer at the RAF Air Defence Radar Museum in Norfolk, said most of the 60 chain home stations had been lost over the years. He added: "Most have been destroyed or damaged. I know of only two in working order." This is a rare opportunity to own a former chain home station as there are only a few left in the whole country. Radar was not invented until 1935 and was put-up around the coast from the Humber to Southampton. "This gave us 100 miles of early warning of German bombing raids, which meant our pilots did not have to go out on patrols but could take off fresh to intercept raids." The Germans had not worked out the importance of radar in 1940, when Britain stood alone against Hitler. Mr Woolley said: "The Germans had basic radar in their ships, so they could go through thick fog, but they did not see further use for it. "Some chain home stations were attacked by the Luftwaffe as part of phase one of the Battle of Britain

but they only succeeded in taking out RAF Ventnor, on the Isle of Wight."Radar masts, despite their huge height, were hard to hit with bombs because they were so slim. "If the Germans had known how important the network was, we could have lost the Battle of Britain." The station near Rye escaped damage during the war, suffering only a direct hit to a nearby bicycle hut. It was built to last, with enough bricks in its two-foot-thick solid walls to make 15 or 20 modern houses.

The concrete roof, which is reinforced with steel rods, will have to be removed to allow a second floor to be built on the existing brick ground floor. Estate agent James Emson expects the property to fetch about 150,000. Buyers will need about 60,000 to do the conversion work themselves or 100,000 if they pay contractors. Mr Emson said: "This is the first radar station we have sold but more buildings like this will be used for dream houses in the future. People have converted oasthouses, barns, and Martello towers throughout the South-east but there are not many left." When the radar station and its sub-station are developed, there will be four properties on the plot and no neighbours in the surrounding 30 acres. Mr Emson added: "The radar station is pretty much a blank canvas. A lot of people would be willing to live in a caravan nearby while doing it up themselves or with help.

This is a unique opportunity to live in the middle of nowhere in a home you have designed yourself. "Without an existing structure, there is no way of getting planning permission to build a house on the marshes. It's so quiet and peaceful here." The radar station, at East Guldeford, is five miles from Rye and 1.5 miles from the fine-sand beach of Camber.

*International Express Tuesday June 22nd 2004 page 30.
Thanks to Jon Five from Canada for sending it in.*

Swiss banish their refugees underground

WHEN Sabo Hudin and his family fled the Srebrenica massacre in Bosnia in 1995, they hoped for a new life in western Europe. Nearly 10 years later they are living in a former military bunker beneath the Swiss Alps.

The complex, two hours' drive from Berne, Switzerland's capital, is the most vivid manifestation of the country's tough new line on asylum seekers who, since April, have had all their benefits cut once their applications to stay are refused.

While thousands elsewhere in Switzerland have been handed eviction orders and given a month to leave, those in the canton of Berne are offered accommodation in the bunker. They receive £3.40 worth of tokens a day to buy food and other essentials from a shop that is also underground.

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For Hudin, 38, it has been a bitter pill to swallow. The family were among the few in the village of Gorni Potocari to survive when Serbian forces overran the United Nations' supposed "safe haven" of Srebrenica. Nearly 7,000 men and boys were killed. The Hudins escaped first to Switzerland and then to Holland, only to be handed back to the Swiss, who now say they must return to Bosnia.

"After surviving Srebrenica, the last place we want to be is in a military building," said Hudin. "We have spent all our money on legal advice and if we had refused to come here we would have been on the street."

The entrance to the former base in the foothills of peaks 8,000ft high could easily be mistaken for a mine shaft. Inside it resembles a submarine with its narrow gangways, fluorescent lights and bunk beds.

The iron-clad ceilings and walls resound to footsteps and each section can be sealed with heavy doors fitted with glass portholes that were designed to protect the bunker's former occupants from gas attack.

The military officers who used to man its command centre have been replaced by social workers monitoring the asylum seekers' movements on closed-circuit television.

Although it is claimed that the bunker can house 100 people, there are only two shower rooms and their use is restricted to two periods each day.

The nearest civilisation is the village of Boltigen (population 1,500), but the locals seem as hostile to the asylum seekers as their government. Boltigen is out of bounds for the "bunker people", who are confined to a 1Å-mile radius of their underground home.

"If they go further, they risk going to jail because the locals call the police," said Ben Bachli, a social worker.

Last month the locals turned out in force calling for the bunker to be closed. "It's beautiful up here and if they're getting everything free they might never want to leave," said Stephan Steggan, 19. "They should find a bunker further away where it doesn't bother anyone."

The crackdown on asylum seekers reflects a shift to the right after the anti-immigration Swiss People's party emerged as the largest faction in October's elections. Its billionaire leader Christoph Blocher, the justice minister, has vowed to expel unwanted foreigners.

Rules drawn up by Blocher to be put to parliament this autumn will empower local government to deport refugees who fail to produce valid identification papers within 48 hours. Asylum seekers would also be banned from using a mobile telephone, applying for a driver's licence or attending an educational course.

Of the 20,000 people who applied for asylum last year, most have lost their benefits and have been ordered to leave. In Lucerne, a family of four who

claimed to have escaped from a war zone were found huddled inside a telephone box after being evicted from their flat.

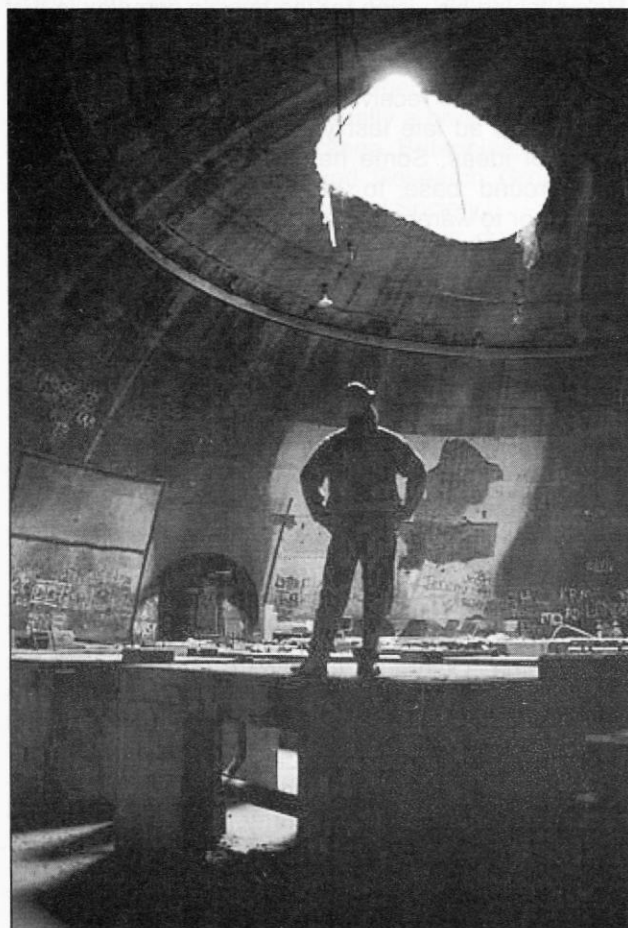
The underground solution adopted by Berne could catch on elsewhere. "We would like to see the model used in all the cantons," said Reinhard Wegelin, a spokesman for Blocher's party. "We have bunkers and tunnels all over the country."

Hudin, however, has given in and agreed to return to Srebrenica. "They keep asking us what the problem is because now it's safe," he said. "But the people who killed our friends and relatives are still free men there."

From Justin Sparks, Berne

Buyer or investors sought for abandoned missile site

BATUM, Adams County — Bari Hotchkiss envisions a day when sightseers flock to his 57-acre plot of land, though looking at it, you couldn't imagine why. The desolate swath 35 miles northeast of Moses Lake is little more than mounds of dirt and sagebrush encircled by a forbidding chain-link fence.



Bari Hotchkiss stands in the powerhouse of the missile-silo complex he purchased in 1998. Generators salvaged from the site were removed through the hole in the dome. Hotchkiss envisions the site as a corporate retreat, adventure camp or winery. He is looking for investors or an outright buyer

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But what rests underneath, he says, is a link to our nation's history. Five stories below the surface sit more than a dozen shock-proof structures connected by thousands of feet of tunnels. Three hulking silos descend 155 feet. Forty years ago, each housed a nuclear-tipped Titan I rocket aimed at the Soviet Union.

The site is among dozens of early nuclear-missile complexes that dotted the landscape at the height of the Cold War. The sites were later abandoned and sold for scrap, and they now occupy one of the most bizarre segments of the real-estate market.

Hotchkiss hopes to lure investors to transform this subterranean concrete-and-steel fortress into an "ultra secure, ultra private" corporate retreat.

Other possibilities: a world-class winery or an adventure camp for kids, complete with a rock-climbing wall in one silo, a scuba-training pool in another, and a Cold War museum in between.

He also could convert it to industrial use, he says, or sell it outright. His asking price: \$3.4 million. Hotchkiss purchased the property for \$275,000 in 1998, according to records kept by the previous owner.

He's pitching his vision for the missile complex in that inevitable meeting place of the quixotic and the commercial: eBay.

He says he has received thousands of nibbles since posting the ad late last year. So far, no takers, but plenty of ideas. Some have talked about using the underground base to grow mushrooms, to store records or to warehouse hazardous waste.

Hotchkiss, 46, says he'd rather have it as a place the public can treasure. "It's irreplaceable," he says.

His asking price, though, is an eye-popping sum in the obscure marketplace of abandoned missile silos.

"I think it's high for the market value," says Edward Peden, owner of 20th Century Castles, a Kansas firm that specializes in underground real estate.

Peden lists 10 sites for sale on www.missilebases.com, his Web site. Prices range from \$230,000 for an 11-acre, Atlas-F site in Shep, Texas, to \$1.4 million for a 200-acre Titan I site near Denver.

The federal government built 18 Titan I installations between 1959 and 1962 at Air Force bases in Washington, Colorado, California, Idaho and South Dakota.

Three of those sites — including the one owned by Hotchkiss — ring former Larson Air Force Base outside Moses Lake. The other two are in Warden and Royal City in Grant County. They operated for less than three years. All sit largely unused and in disrepair.

Around the country, dozens of former missile complexes are in private hands. Where once sat Air Force crewmen, poised to launch a nuclear strike, are living rooms, farm sheds, and, occasionally,

illegal drug labs.

At least twice in Washington, they have been the scenes of macabre crimes.

In the 1970s, workers pumping water out of the Warden complex discovered a skeleton chained to a heavy tire. Gig Harbor resident Gwendolyn Ash, whose husband was part-owner of both the Warden and Batum complexes, remembers the crime. The remains were identified as a woman from Othello, Adams County, who had been missing for four years. The woman's husband was later convicted of her murder.

Last year, a long-haul truck driver was convicted of first-degree murder after killing and dismembering a state auditor at an Atlas missile site where the trucker lived near Davenport, Lincoln County.

"The sites have acquired a kind of strange reputation, a negative reputation in the minds of some," says Peden of 20th Century Castles. "Our hope is that these are going to fall in some good, capable hands by people who are going to maintain them into the future as the historic sites that they are."

Peden and his wife have lived in a converted Atlas-E site in Dover, Kan., for 10 years. He estimates that



Bari Hotchkiss steps out of the abandoned former missile complex he owns east of Moses Lake. He has listed it on eBay.

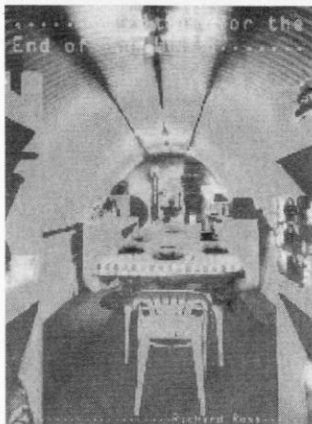
about 70 percent of the nearly 120 first-generation missile complexes in the country are owned privately. The rest belong to government agencies. Some haven't been touched in decades, some are flooded, and some have been refurbished into valuable properties.

"The thing about them is they are unique structures," Peden says. "They cost millions to build, and there will never be anything like them again. That's why we call our company 20th Century Castles, because we think these structures are the 20th-century counterpart of those old European structures that had such mystique."

By Ray Rivera

Books

Waiting for the end of the world



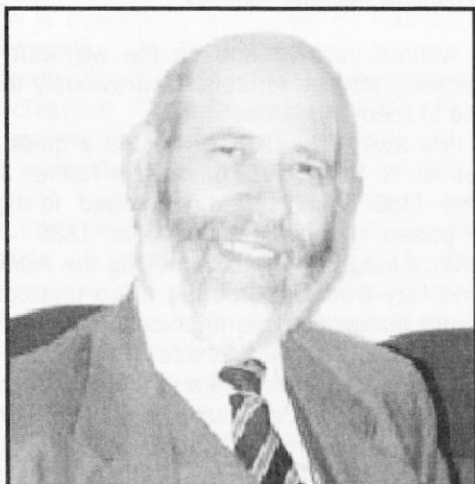
Ross, Richard, 2004, *Waiting for the end of the world*, Princeton Architectural Press, 144pp, ISBN 1-56898-466-9, paperback 18cm x 22cm, \$19.95:
www.papress.com.
www.richardross.net

This book of photographs of bunkers, mainly in the US, Moscow and Switzerland, has some good col-

our plates and a personal narrative. The author is primarily a photographer, so the pictures are taken with an eye to shape and colour. Most were of places I had not seen before, and this book will appeal to the dedicated collector of things underground and cold war. There are the homely touches of the private shelters and the dilapidation of some in Moscow, the pristine cleanliness of Switzerland's apartment bunkers and a couple of shots of Belsize Park from an unusual angle. This is an artists' and philosopher's view of bunkers and there's not a plan to be seen. But as an exploratory photographic essay it's a nice addition. Richard's Ross's web site leads you through most of the photos in a set of scrolling windows.

From Bob Hankinson

Who's Who in Sub Brit



MC Black -- Vice-Chairman

MC Black was born in Kent, lived the early part of his life in Greenwich and was educated at Haberdashers' Aske's School and Imperial College where he studied Physics. After three years, he graduated with B.Sc., A.R.C.S. and was elected Hon. Secretary of Imperial College Students' Union for a sabbatical year. During his time at Imperial, he played rugby a little for the Royal College of Science and was awarded Half Colours by the Royal College of Science Boat Club.

After leaving Imperial, he accepted a job as a Physics teacher at Langley Park School for Boys (formerly Beckenham and Penge Grammar School) in Beckenham, Kent. About this time he met the late Dr TL Thomas who introduced him to the Minerals Industry Manpower and Careers Unit and the director, Geoff Cox, invited him to attend a course based at Ecton Mine in Staffordshire introducing schoolmasters to Mining. The highlight of the course was an underground trip through Salt's Level that

sparked an interest in underground industrial archaeology which he has maintained ever since.

During this period, the school acquired a Field Study Centre in the Derbyshire Peak District and he frequently took parties of boys there for educational and extracurricular activities. The vacation trips that he organised invariably included the least one underground activity (and usually a brewery visit!). In addition to joining *Subterranea Britannica*, he also joined the Kent Underground Research Group and the Peak District Mines Historical Society.

After fourteen years at Langley Park, during which time he taught Physics, Chemistry, Biology, Physical Science, General Science, Mathematics, Computing, Astronomy and manners (!) coached Rugby and Cricket, looked after the school's Field Centre, had responsibilities for Audio Visual Aids, First Aid, and rose to become Head of Electronics, but not Head of Physics (when the incumbent retired), he left (much to everybody's surprise).

He then moved to Haileybury and Imperial Service College near Hertford where he taught Sailing and Navigation as well as Physics. There was not much time for anything else here as lessons took up six days a week and usually finished at 18:30 -- parents get good value for money at boarding schools!

After three years at Haileybury, he became totally disillusioned with school education in England due to the way in which HMG was continually interfering and moving the goal posts and left.

He then moved to the University of London External Programme where, after several reorganisations, he is now Information and Law Support Manager. As this is a "9 till 5" job, he has plenty of opportunity to indulge his recreational interests which in addition to things subterranean include "The Great Holmesian Game".

The saga continues.....

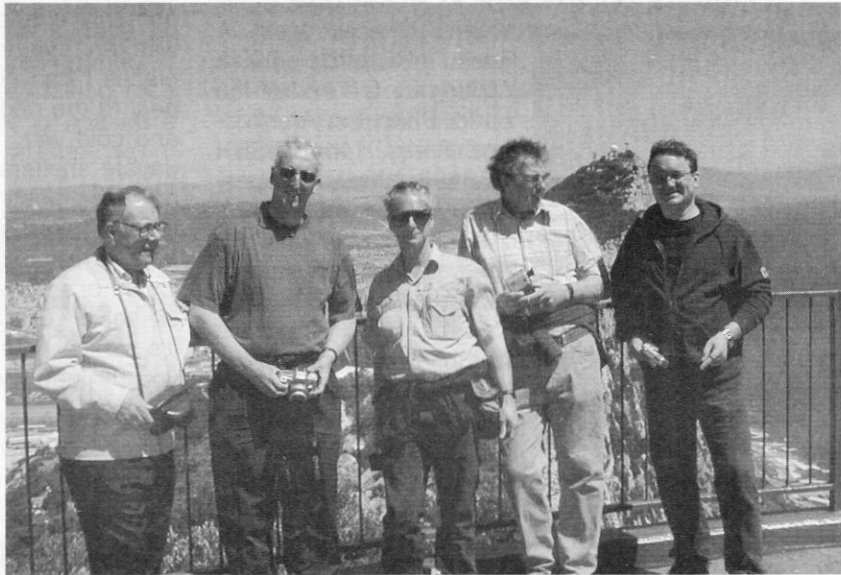
Gibraltar Weekend Trip Report

The tunnels of Gibraltar are extensive. This self-governing British Crown Colony keeps an underground secret of at least 30 miles of tunnels excavated intermittently from the late 18th Century. A weekend trip open to all Sub-Brit members and friends to find out more seemed an excellent idea. So a small party of Sub-Brit members with limited time in their busy lives set out from Luton airport to get a feel for the 2.25 square miles of 'The Rock' at the western portal of the Mediterranean Sea.

The afternoon flight by Monarch Airlines was on time and excellent value, depositing us on the tarmac at Gibraltar in the warm early evening sunshine. As we walked down the landing steps the huge rock face of the northern edge of 'The Rock'

dominated our view. Immediately members of the group spotted the 1782-1800 first phase of early tunnelling during the Great Siege of 1779-83. During this time the galleries overlooking the isthmus forming the North Front were completed. We had a chance to explore these in person on the second day. The extremely friendly atmosphere of the airport extended to the locals as we boarded our waiting taxis to take us to our hotel. The 3 star Bristol Hotel did us proud. (For those wanting a touch of luxury the 4 star Rock is the place.) A quick stowing of luggage in rooms and we were off as a group to investigate the local pubs. The Tunnel in Casement Square got out vote and remained our unofficial base of operations for the next few days. After that, a late walk back to the hotel through the main street with the warmth of the dying Med sun on our backs, what could be better?

The next day it just got better. The first underground excursion of the trip was to the Lower St Michael's cave system. A quick taxi trip from the hotel found our guide for the day Tito Vallejo a local historian and underground enthusiast of note. Tito took us through the locked entrance to the cave and for the next three hours we marvelled at the underground lake, natural grottoes, a multitude of different stalactites and stalagmites in the naturally formed cave system in 'The Rock's' limestone body. The cave is lit throughout but the participants require a certain amount of physical fitness. It was described to me as an underground obstacle course, I can only agree. This show cave is totally unspoilt and everyone who has an interest in Geology should make the effort to see it. I certainly have not seen anything like it anywhere in Europe, for the sheer size, quantity and quality of limestone features that you only read about as a geology student. The group managed the entire



The Gibraltar weekend explorers

system without incident and on the way out some were showing athletic tendencies previously thought banished to memory.

A taxi ride away 'The Tunnel' hosted a quick lunch and then on to the W.W.II tunnels, a further 3 hour visit. The MoD tunnels had continued to have a second phase of development from 1880 - 1915 when after a long gap of no tunnelling the Admiralty, Army and City Council all began to go underground to excavate magazines, communications tunnels and water reservoirs. The third phase from 1933 - 1938 extended the water reservoirs and the construction of air-raid shelters, underground hospitals for the protection of civilians and military alike during this politically unsettled time. The fourth phase is the period we now found ourselves standing in. The 1939 - 1945 period was a busy time when the increased war garrison required new accommodation space, and space for food, equipment and ammunition. By 1939 the total length of tunnels was just 7 miles. In 1940 the first tunnelling company of the Royal Engineers arrived to show them how to do it. Three further companies arrived and by the end of the war had cut a further 25 miles of tunnels into the Rock excavating at least 35 million cubic feet of spoil. The thing we all noticed was the general humidity, which was very high, possibly as high as 90-95 per cent. Condensation and dampness therefore occurred in all systems. Corrosion of metal work was particularly evident.

To keep ammunition in a good condition must have been a nightmare. The chambers were cut into the rock and then lined to help combat the conditions. The easiest way to do this was to erect wooden and corrugated iron Nissan huts inside the tunnels and then heat them electrically. We visited the remains of rotting, mould covered, fungi heaven, huts of Brigade

Gibraltar Weekend Trip Report

HQ off Green Lane and then followed the large two lane vehicle communication tunnel called the Great North Road for several hundred metres.

It was from these tunnels that General Dwight Eisenhower planned the invasion of North Africa during W.W.II. The steady temperature of 62 - 65 degrees Fahrenheit inside the tunnels was quite warm in the side tunnels but when we entered the main internal roadways like the Great North Road a gentle breeze was blowing. We passed the Peterborough Chambers and saw the Green Lane magazine ramp. The final phase of excavation from 1946 - 1968 linked many of the existing roadways and storage chambers in a more efficient way. It was at this time that additional works to install staggered entrances for protection from blast and heat flash in the new atomic age were completed. At this time the engineers discovered an unexpected find called Wilson's cave when they were constructing a staggered blast exit for the Green Lane magazines, but size is everything and Lower St Michael's cave wins yet again.

The source of part of the electric power was found in a side chamber. Three of the largest direct injection diesel marine engines I have ever seen in a huge REME excavated chamber the size of two tennis courts and roofed with stainless steel corrugated sheets thirty foot from the floor. This provision for generation of many kW's contributing to the local tunnel grid capacity of an installed load of more than 1,200 kW. (I had to revise my view and agree that the engine in Monkton Farleigh was just a baby after all) These units supplied lighting, limited heating, power to workshop machinery. The lighting to the main tunnels are principally 100 watt bulbs at 25 feet centres, later on we found six foot fluorescent strip lights and in the hospital areas they are still working but now from the Gibraltar mains.

The tunnels themselves acted as the ventilation system and we saw banks of large 1.2 metre axial fans and radiator banks for wintertime heating. The intakes for the air were directed via full room size steel roller shutters. The majority of the tunnels remained unlined but a later section was lined and reinforced for the provision of more electricity generation equipment.

The bases for the huge 50,000-gallon fuel tanks remained in side chambers and still the smell of diesel permeated everywhere. Onward we walked towards Calpe Hole and the site of Calpe Hospital. There is nothing left except a tiled operating theatre area between two large ward chambers. As the army pulled out a policy of sell or remove, reminiscent of hoards of Barbarian Vandals appears to have been active. (Typical MoD directive) We exited into the bright sunshine just south of Hayes Level tunnel where in 1943 General Mason-MacFarlane was photographed leaving the entrance with the Resident General of French Morocco M. Puaux.

A stroll down through the back streets of the town found us parked outside 'the Tunnel' getting sun burnt. A leisurely stroll back to the Hotel allowed a quick wash and change of clothes for our group meal at the rather excellent restaurant called The Waterside at Queensway Quay down at the Marina next to the small apartments for only 1.4million sterling each. After several beers and cracked glass changes, dropped drinks and generally good natured banter we got the impression they were glad to see the back of our noisy party, although we all seemed to have a good time, thinking back it must be something about the Brits abroad, we do seem to make that extra effort after a few beers.

The final day dawned and with my tourist Daily Star firmly gripped under my arm the party left for an extended tourist taxis tour, a combination of standard Rock tour and the Military tour. First stop was the 100 ton gun (like its friend to be found in Malta) followed by the house where Nelson's pickled body was kept, old Trafalgar harbour, Parsons Lodge, Europa Point (For the trivia quiz; the Gibraltar lighthouse at Europa point is the only one regulated by Trinity House outside the UK. It dates back to 1841 and stands 49 metres above sea level with a range of some 37 kilometres.), O' Haras Battery (9.2-inch Mk X on a Mk VII mounting, these are now becoming rare as all the 9.2-inch coastal guns protecting UK shores were removed and sent for scrap in the mid 1950's, the only other place I have seen something similar was at Kingston in Jamaica but only one barrel was left all the rest of the mounting having been scrapped or exchanged for a bag of weed.) then followed by Upper St Michael's Cave. This natural cave is regularly tramped through by the great cruise ship pampered hoards and can be summed up as magnificently sterile, rather like a artificial Disney World sound and light show cavern. The cave was used as a hospital during W.W.II and it was at this time when they were blasting a second exit for stretcher cases that the superlative Lower St. Michael's cave was discovered. If you are on that last world cruise before dying of terminal cancer then I suppose you ought to see it but otherwise I'm sure you can ask the nurse to find something else to push you around.

Next we saw Monkeys or should that be Apes, a young mum with two five or six year olds was slightly nonplussed to be told by her offspring that they wanted to see the chickens rather than the monkeys. (A W.W.II pillbox was making a very nice hen coup on the top ridge by a local.) The Great Siege Tunnels excavated by artificers of the British Army during the Great Siege of 1779-83 was next on the list. After ticking the box we passed the Moorish Castle, an ancient fortress last rebuilt in 1333, its tower of Homage dominated the only land entrance to Gibraltar. (It was closed for renovation; apparently certain persons had been throwing bits of loose

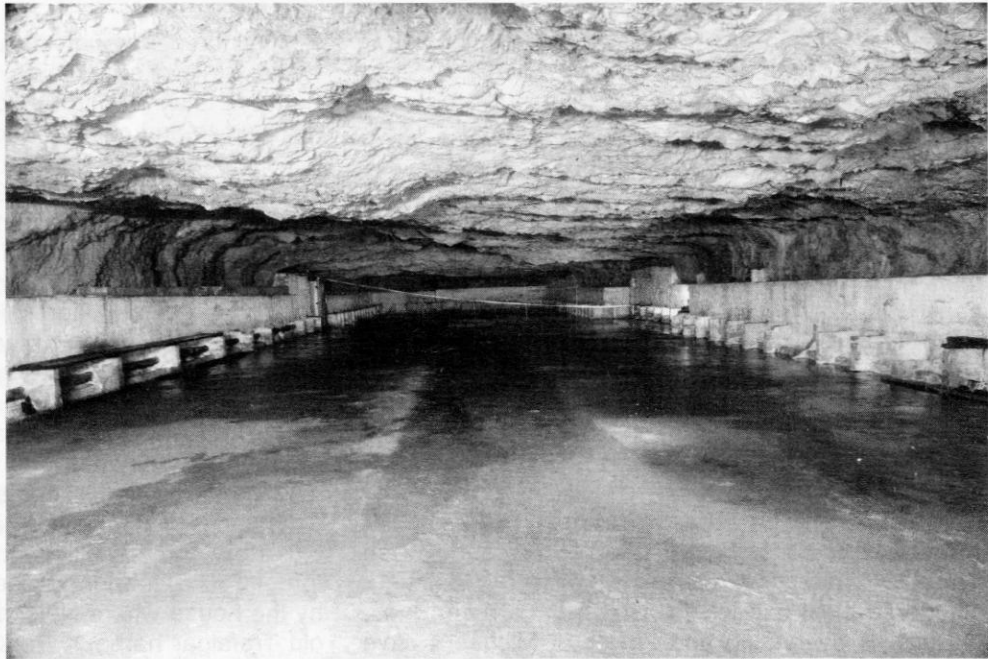
Gibraltar Weekend Trip Report

masonry down from its heights onto the Gibraltar Prison exercise yard, which is situated immediately below. The inmates objected so while the powers that be are wondering how to fill in the risk assessment it remains closed.)

After this exhausting tourist morning soaking up the sun a trip on the Cable Car was called for where we had our lunch at the cafe on Top of the Rock. The most exquisite views of Spain, sea and Morocco. The weather was excellent. After a pleasant meal we descended to get our hats and lights from the

hotel for the final underground portion of the trip. We inspected the old Trafalgar cemetery where those that survived the battle but subsequently died from their wounds on land were buried. One interesting grave contained two poor chaps who were killed by the same cannon ball, rather bad luck really.

A quick taxis ride took us back to Europa point where hunt the bunker was begun. We were looking for the Rock WT Station bunker. Trying not to attract too much attention mingling with the other tourists with our hats and lights in the bright sunshine of a Saturday afternoon our party followed the excellent instructions downloaded from the Sub-Brit website to find the entrance. After passing several backyards, barking dogs, sunbathing ladies who should have know better, negotiating a wooden staircase to the cliff face we found the pillbox covering the North adit entrance. The excellent diagram supplied by Nick Catford helped get our bearings and we found all the interesting features. We also found a few additional things like confirmation that the machinery space at the bottom of the emergency exit was definitely the foundation of a diesel generator with exhaust pipe disappearing through the roof, also down the south adit the ventilation plant extended alongside to vent generated heat from the transmitting equipment passing the decontamination showers. In the adjacent room we found an asbestos lagged pipe leading to the outside which on reflection must have been a hot water vent pipe for a water heater for the showers. All the remains of the fittings were very badly corroded and some fire damage was evident. The whole character of the fittings was very Navy, reminiscent of a warship's ops room. It only took a little imagination to almost hear the hum of the ventilation equipment, the whirr of evaporator fans,



The remains of Calpe Hospital

the distant drumming of the generator and refrigeration compressors with that intense claustrophobic solder and burnt wire insulation smell you get from transmitters.

Climbing back out of the entrance we saw the remains of some of the forest of radio masts once on this part of 'The Rock'. We then wandered up to the Europa point gift shop and had a beer while our taxis arrived.

Everyone seemed pleased with the afternoons work and so after dropping off our hats and lights at the hotel we went for a further celebratory beer and ice cream at the Tunnel in Casement Square. It was a truly decadent way to spend the last few hours before our flight home. In the early hours of the morning I got home and reflected on the previous few days. The combination of a place in the sun with subterranean features and good company could not be beat, the only downside was going to be explaining to my wife how I'd managed to get so sun burnt. BL. Group members:- Vince Stenhouse, Mike Adamson, Steve Underwood, Adam Rassim, Ian Walker and Bob Lawson.

Further Reading and contacts:-

www.flymonarch.com

www.gibraltar.gi/bristolhotel

"After the Battle"; No. 21 Gibraltar.

"The Tunnels of Gibraltar" by M S Rosenbaum & E P F Rose from the Gibraltar Museum.

Lower St Michael's cave trips organized and booked from by Tito Vallejo - titovallejo@gibnynex.gi

From Bob Lawson

Berwyn Tunnel – Llangollen Railway

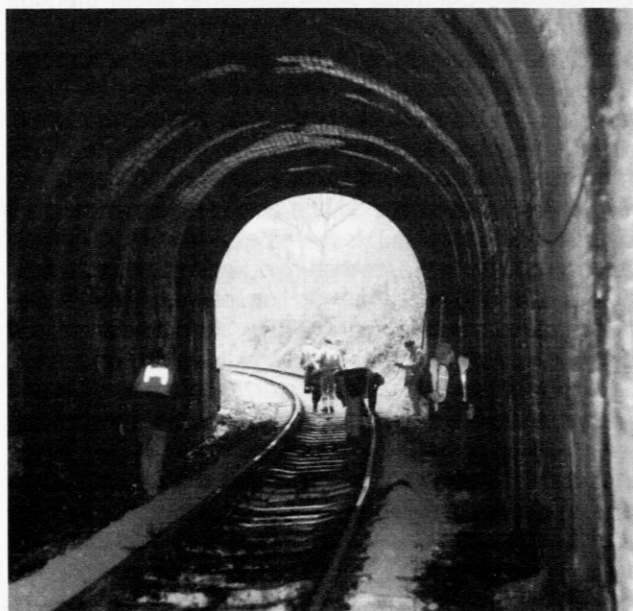


Berwyn Tunnel—East end

This short article describes my experiences of tracklaying through the Berwyn Tunnel on the Llangollen Railway as a volunteer.

My first “meeting” with this tunnel on the Llangollen Railway, was as a gullible member of the public attracted by posters advertising – “Come and Build a Railway !”. I telephoned the number, spoke to the Signal & Telegraph engineer, and promptly gave up all my weekends for the next 15 years.

The joining directions were - simply drive up the A5 past Llangollen, turn right after Berwyn Station, to the end of the road, up the ramp, onto the trackbed,



West Coast Main Line Permanent Way Gang

through the railway tunnel, and you will find us after about a mile. Well – it sounded adventurous, so along I went.

The Llangollen Railway (LLR) had re-laid the line from Llangollen to Berwyn, and a Manpower Services Commission project (remember those !) had started continuing through the tunnel, and given up. This was the start of re-incarnation of that project, the track had been removed from the tunnel, and work had started at the far end, and was working back towards Berwyn.

The trackbed had been re-graded – unfortunately the ‘dozer driver was usually employed on the

West Coast Main Line and it was graded for 100 Mph running, our limit under a Light Railway Order was a much more humble 25 Mph, resulting in a rather steeply canted track.

Track laying consisted of :

- Hooking up 2 pairs of 60 foot rails onto the back of the trusty Fordson tractor (nicknamed Mallard because it was blue with red wheels), and hare off through the tunnel, towing this ensemble along the track bed. Repeat 5 times to provide enough rails for a weekends work. The rails were laid out ten feet apart in two parallel lines from where the track ended (railhead).
- Load up the Scania truck with as many concrete sleepers as we could get on, and drive through the tunnel, to the turning points, and reverse up to the railhead. This was especially dangerous, as the space was very limited in the turning circles, which overhung the River Dee in the valley bottom. Hence one of turning points was always known as “Tanners Leap” after someone who flew the Fordson tractor off it down the bank.
- Unload the sleepers with the Scania’s HIAB, position them – 26 sleepers per 60 foot rail length, closer together at the ends of the rails.
- Using brute force, lift the rails onto the sleepers, clip up, bolt up the fishplates and repeat for the next pair of rails.

Berwyn Tunnel – Llangollen Railway

Eventually, we reached the dreaded tunnel. We were terrified of it, because of the restricted clearance, and no-one fancied reversing the Scania for 689 yards at a go.

The solution was to use an "All Terrain Fork Lift Loader", which would drive up the tunnel with 4 concrete sleepers on its forks up to the railhead, it would then reverse, and we would pull off the sleepers, one at a time. It could turn around in the tunnel, and drive out.

After six weekends, we had finished track laying in the tunnel, and celebrated with a "Golden Fishplate" ceremony, at which our line doubled in length.

As an experience, it was unique and interesting, We were quite keen, and the working conditions were quite good – the Welsh monsoon season had just started, generally there is a draft through the tunnel.

We had to re-build the wing walls at each end, as they were in a dangerous condition – other tasks including painting the manhole refuges white, so that if anyone should be in the tunnel during running trains, they were to be used as safety refuges. One memorable refuge had a ghost painted in it – always afterwards known as "Rimmers Ghost".

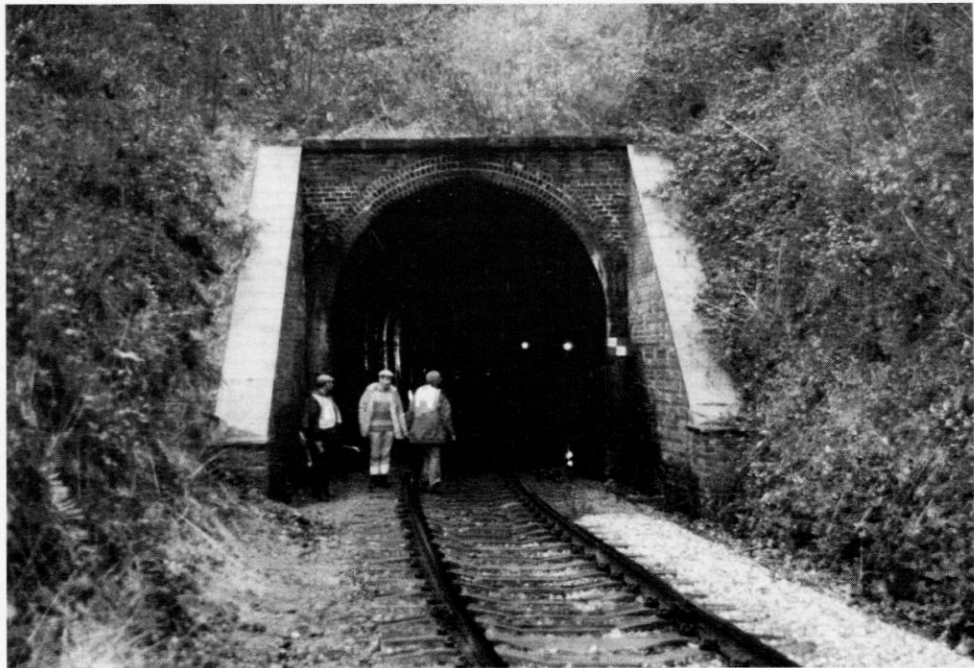
The Tunnel Described.

The Llangollen Railway was part of the Ruabon to Barmouth line, which was absorbed into the GWR, and closed by Beeching. The Llangollen Railway Society has the aim of rebuilding between Llangollen and Corwen, currently it has reached Carrog, approx 7 miles, and 2 miles short of Corwen. The line's engineer was a Mr. Robertson.

The Berwyn Tunnel takes the line underneath the A5 twice. As an aside, the A5 was built by Telford, who described the Berwyn to Glydyfrdwry section as the most difficult to build, as it literally hangs on the side of the valley.

The tunnel is usually recognised as being around 689 yards long, and single bore. Early accounts of the tunnel have it as only being brick lined for the first 20 feet at each end, the rest being natural rock. It is most certainly continuously brick lined all the way now, perhaps it was originally natural rock, and lined at a later date, but no records exist of this.

It is also very dry, with only a bit of a wet patch at the



Berwyn Tunnel—West end

end of the east end. It has quite a steep gradient, which is quite a test for the engine drivers going west, especially as it is approached up a 1 in 80 gradient from Berwyn station.

The bottom end (east) has a sharp curve, otherwise it is straight. Mr. Henry Robertson's original plans depict a rather grand portal at the Eastern end, with a rather shorter tunnel length. However, there simply is not enough rock to enable the rather grand design as in the plans, so presumably there was some decision to make it slightly longer, accounting for the increased length, the sharp curve and the rather plain portal at the eastern end.

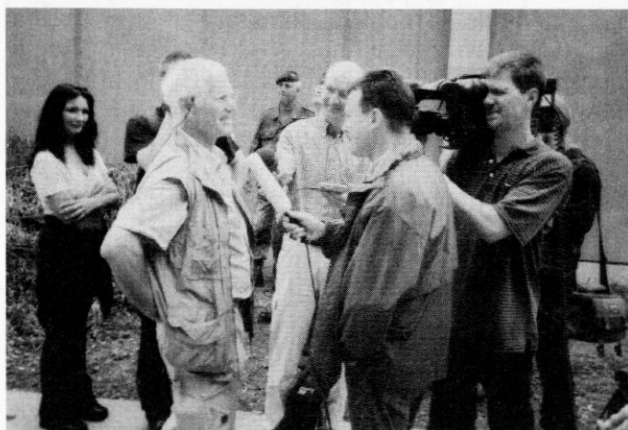
Larger scale OS maps show the route under the A5, with some marker – perhaps indicating a construction shaft, but despite several excursions above the A5, I have never located anything. There is certainly no construction shaft visible within the tunnel, but they are frequently bricked over with the tunnel lining and forgotten. This is frequently a problem with BR (or whatever it is this week). The construction shafts are usually badly documented – or even not all. The top of them were often timbered over, and forgotten - the first knowledge of them is usually when a hole appears in a field or moor. The shafts accumulate debris and water, supported by only the brick tunnel lining, which eventually may start to bulge. The track authorities now do laser surveys of their tunnels, which provide a continuous profile of the tunnels, these can then be compared to previous surveys, and bulges identified and monitored.

From Phil Pritchard

What did you do in your retirement, old man?

"Please, miss, why do grown men find such an interest in holes, where they spend ages trying to get in, grope around a bit and then come out exhausted?"

The 14th century Chinese philosopher, Hu Flung-dung, admitted at the end of a full life that this was the one question which he had never been able to answer. In my own modest way, I replied to this dumb-cluck question from an East German TV guy with a microphone in his hand and an asinine grin on his face with a counter-question: Why do people collect stamps or elephant turds?



The answer is fundamental to an understanding of the whole reason for our existence: Because, like mountains, there are bloody well there! Unfortunately, unlike mountains, they do disappear from time to time in the sense that mindless local authorities (and yes, we do have them over here in the Fatherland as well) decide that the bunkers are: a) dangerous, b) no longer necessary, c) that WE should be seen to be doing something, etc. Forward thinking people should, therefore, get up off their rear ends and do something about these holes in the ground before they all disappear.

But how do you set about finding a bunker? And what do you do with the information that you discover?

Since Dan McKenzie was once more forced to leave his house and move into his EGER Gaz-66 vehicle due to the fantastic number of contributions to this edition of our magazine (it always amazes me that certain people have so much to say on the mailing list for "Distressed Gentlefolk with an Interest in Bunkers", but whose ink runs dry when magazine contribution time comes round), I persuaded him to ditch these worthless contributions in order to make space available for a missive from the depths of Bavaria in an attempt to throw a little light on how I spend my retirement.

When my company decided that my services were no longer required due to a) old age (58), b) a need to make room for younger people, c) a more flexible and "get-with-it" approach to man management being

required (quote: You are rather conservative in your managerial style. This meant: I told my bodies what I expected of them, by when and how. Result: Best (and happiest) group in the office. Replaced by: teams, team discussions, visions (I thought only weirdos had those), and well, you know the story!) Where was I? Yup, when they eased me out in 1998, I had no plans for the next 40 years. However, I had already started thinking back to my army days, sigint and where my old Russian "employers" were. Lists began to appear with details of locations, who was subordinate to whom, etc. Large gaps also began to appear in the list, revealing that I really only knew about the Ivans around Berlin, whereas the rest of East Germany was pretty empty. Actually, not really surprising since I had been stationed in Berlin - but that's life. And then a new world opened up!

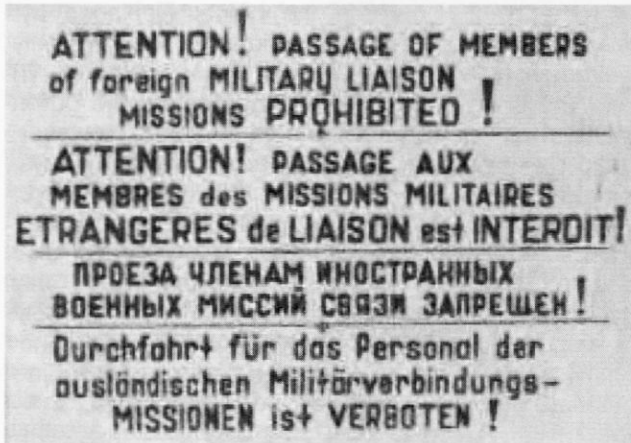
I started writing to each ministry of the interior, i.e. local Home Offices, in each of the states in EGER, the ministry of defence and anybody else who might possibly know something that I didn't know - not difficult!, I hear in the ranks. Most of the time I was politely put into the recycling bin, but occasionally an answer came back with further contacts, whom I duly pestered. Then the odd phone call with a suggestion, a meeting with a new face, and the circle gradually began to expand. The first three years were the hardest - some 300 letters were written, countless emails, but then the snowball, like Topsy, began to grow. There were other nutters out there!!

By this time I had also made contact with some former EGER service personnel with a similar kink, various people who had served in the British and American military missions in EGER and, of course, they all knew other people.

We developed into a small working party of some 5 or 6 dedicated nutters researchers. Most of the time, there are only two travelling around since they live on the doorstep to most of the former military facilities in the state of Brandenburg around Berlin, whereas I have a five hour drive before I can even start. Not so bad going, but the journey back on your own late on a Sunday can be killing when you have had a busy weekend, clambering in and out of the aforesaid holes and avoiding the opposition: watchmen, dogs, horseflies and the like. This means that we often have to leave our vehicles some distance away (German registration numbers show the town or district where you come from, i.e. not from 'ere) to avoid attracting attention and then leg it for several kilometres (work it out!) through the forest with all of our kit. The work is also seasonal: in winter, there are no leaves and the grass is dead and down so you can see any mounds in the ground, but it's monkey weather very often. In summer, lots of foliage and high temperatures, so this tends to be the quiet period. The best times are spring and autumn (work out why!), but since we are totally dedicated, we will

What did you do in your retirement, old man?

also set off with our kit when even mad Englishmen and dogs have retired for a siesta.

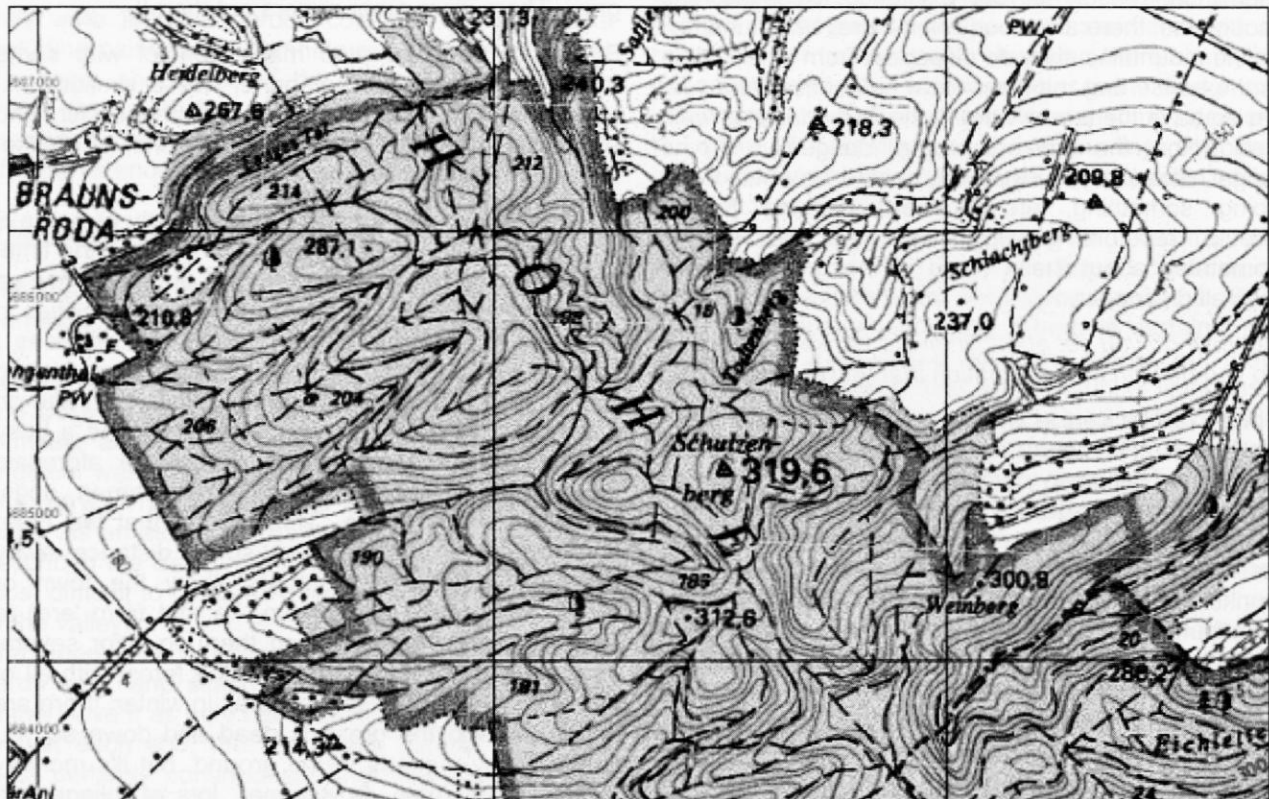


But how do we find the sites, and which sites?

By now, we have collated from various sources an extremely extensive databank on the locations where Ivan formerly had his soldiers - not just the big boys (armies and divisions), but also vehicle repair depots, workshops, radar sites, etc. When you know that Ivan's armies, divisions, regiments / brigades liked / likes to have command posts (C3 - command, control and communication) and of these, several in various forms (main, reserve, forward, rear), depending on

the level you're looking at, they must be around somewhere. They won't normally be on the doorstep of an army HQ, etc. so you start to look at their playgrounds - the military training areas which were closed areas, not only for nose-y-parker military missions, but also for the local German population.

But where were the training areas? Right - here we go: we (the nutters) all live in the past. We are only interested in maps, aerial photos, etc. for the time up to the Russian withdrawal (1990-1994), since many of the former garrisons have been totally demolished or converted to yuppy-type accommodation and the training areas (TA) have been turned over to the German public to walk though so that they can spot *picus viridis* or *upupa epos* as they wing their way between the bomb craters and the piles of empty beer cans, wrappings and used loo paper or tissues, which nature-loving visitors always seem to leave behind. Fortunately, we have available very reasonably priced electronic maps for the whole of Germany (are you listening Ordnance Survey?), where we can click and zoom from 1:4.3 million down (or is it up?) to 50 thou. Since we refuse to update to the trendy version with all kinds of gizmos, we can still find the "as was" state of the ground at the time of the Russian withdrawal. So, you look for the dark line, which signify a TA or military restricted area, in the zone of interest.



Not very promising here as the only interesting point is the white area in the top left corner: but who would put a Command Post just inside the edge of a Training Area?

What did you do in your retirement, old man?

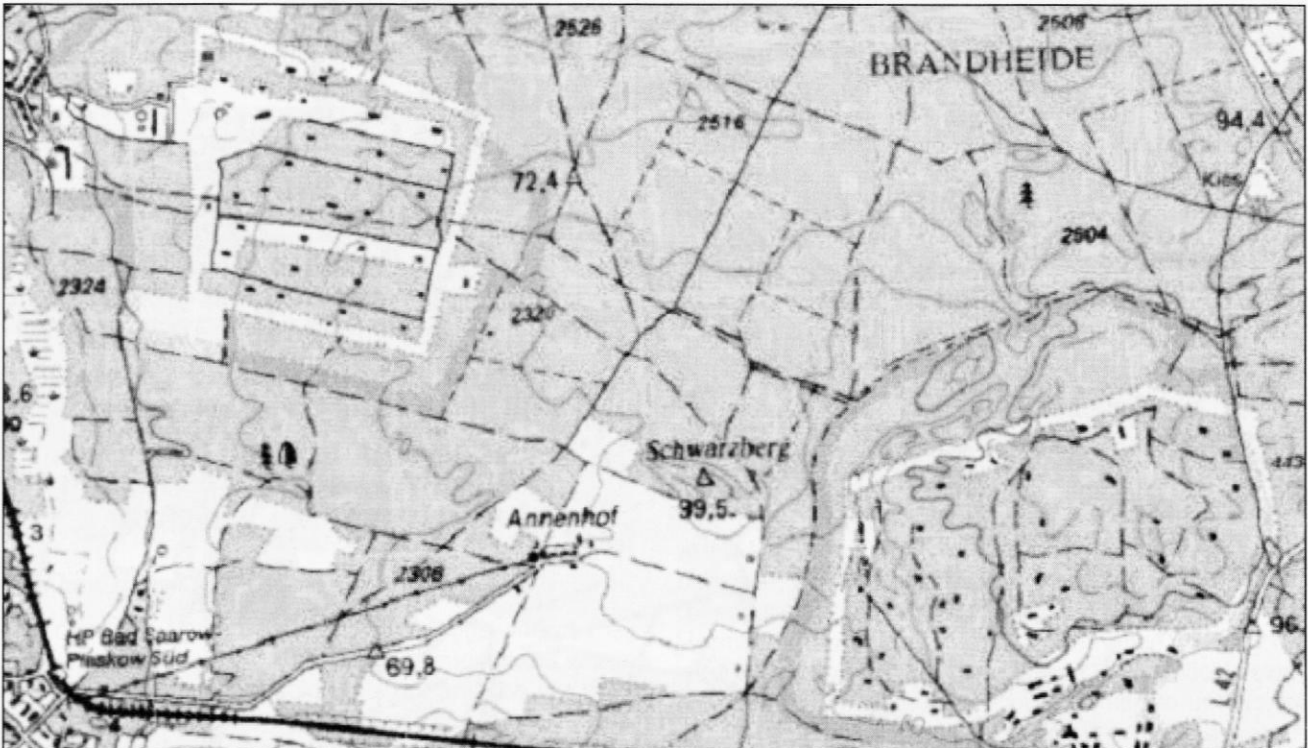


Other Training Areas are more promising !

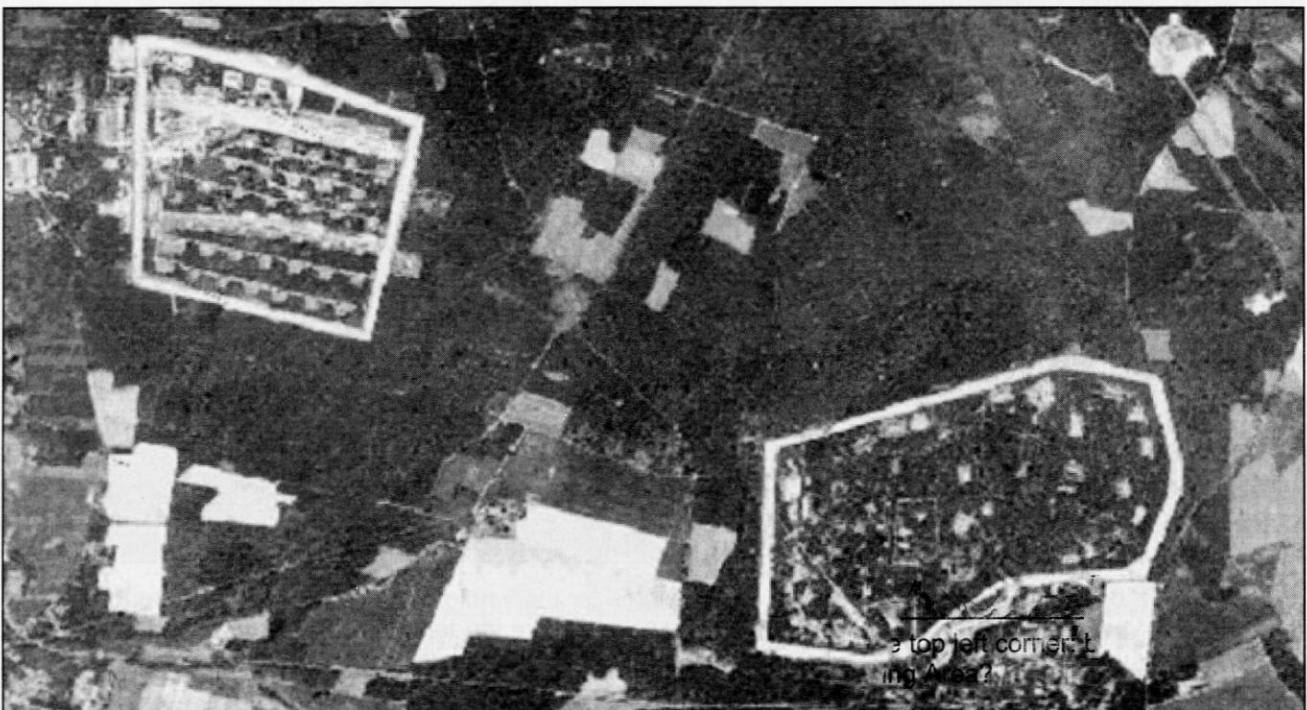


Before we set out on a recce, we turn to our aerial photos for the whole of Germany (also reasonably priced and in the old version) and take a look at the same area as, unlike the topographical maps, the aerial photos show whether vehicles have turned an idyllic footpath through the forest into a Soviet dual carriageway.

What did you do in your retirement, old man?



You also develop a feeling about certain shapes - the military like rectangles, for example, so rectangular holes in the forest might house something. The Russians also had a strong dislike of fires, so firebreaks were created in the forests - also nice straight lines. But these must "surround" an area as they could otherwise be the lanes cleared through forests for overhead power lines. Here you can see two military areas (dark lines) with fire breaks (white strips) surrounding munitions depots. Interestingly, the right-hand munitions depot has an inner area on the map, looking like a square figure "8". Just to the west (i.e. left!) of this there is nothing on the map. However, the aerial shot shows another firebreak (what a give-away): this was a nuclear warheads storage area. So, we then started looking at all aerial photos of Soviet munitions depots to see which of them had an inner area with a firebreak - easy-peasy!! The equivalent aerial shot makes a nice comparison.



What did you do in your retirement, old man?

Aerial photos can also show you areas where you needn't bother to go: the following aerial shot shows a tank training area, where the tankies are going to be bombing up and down in their metal monsters, oblivious of the world and letting off rather loud bangs in the direction, one hopes, of the targets. Consequently, no one, not even a staff officer, would put down a CP in the middle of this area. In the course of time, and after much trudging through thick forests in vain, you learn to be very selective in what you are going to investigate



A further indicator is the location of tropospheric sites. There were certain military standards which laid down that, for example, a tropospheric site was to be positioned within 15 km of the CP. Since we all had something to do with military intelligence we were able to work out that a circle centred on the tropo site and with a diameter of, you've guessed, 15 km would almost certainly include the location of a CP, and probably an important site since only the big boys had a tropo site to play with. Using the criteria described above (TAs, other restricted areas, etc.)

would normally give us a fairly firm idea as to where to search. Since surface buildings have often been demolished in the meantime and some 10 - 15 years have elapsed since the command posts were last used, the undergrowth has taken over. Bearing in mind that local authorities have also often bulldozed earth over the entrances, having first filled them in with concrete slabs, you still can't simply go for a walk with your dog and come across the bunker entrance. Once we have reduced the search area to a kilometre or so we form a search line, with each of

What did you do in your retirement, old man?

us some 20 metres from his neighbour, and do a slow walk through the undergrowth until we come across indicators which show that we are in the right area: vehicle revetments, concrete posts from the security fence, bits of barbed wire. Miniature radios provide further technical assistance if the gaps in the search line are even greater since we do not wish to reveal our presence by shouting out when we find something.

After that, you start digging. Fortunately, one of our group was a former NCO, so the two ex-officers can stand around and direct operations (we may look daft, but).

But as I said in my talk to the couple of people who turned up to the Sub Brit Conference in London, bunkers are basically just a load of concrete. It's questions like: Who was in there?, why was it built at this location?, what was its function?, what were the purposes of the individual rooms?, how did the place operate? that then help to make the site come to life. We still manage to find documents and scraps of paper in the bunkers, which provide intelligence in these directions. Bearing in mind that we started off with very little (only our own personal experiences), we have been able to build up the communications system - with call signs, types of radio links - for most of the Soviet forces in EGER. In addition, our large databases with personality lists, vehicle registration numbers (used to identify unit levels), field post numbers (these identify the actual unit), etc. provide further background information.

So what's it all for? Dunno, is the short answer, but it gives us a lot of fun, it keeps us very active (running from the guards and carting kilograms of kit through dense undergrowth), and it's provided me with countless new friends in EGER who had served on the wrong side of the Iron Curtain. Via the internet I have been able to establish contact with former Russian conscripts and officers who served their time in EGER. Obviously, most of the conscripts have very little that they can relate (but even a field post number is useful), but even then some of them come up with some real surprises (details censored). The officers would normally be a really good source of information since they were generally very highly trained, especially the technical officers. However, they were also very much part of the Soviet system and even now are reluctant to reveal any information about their service career. But not all of them!

There is also the Russian equivalent of Google, Rambler, which comes up with an increasing amount of very interesting information on strategic

considerations, but including countless websites created by former Russian service personnel who served in EGER or the other Russian military groups in Eastern Europe. They mostly give an email contact address, so that's a few more emails to be written!

Another gain from this weirdo hobby is the use I have had to make of software, which I didn't even know existed earlier. I have created my own (off-line) website to act as a filing system for the major gobbets of information which we acquire so that the info is more readily called up (at my age, I forget which of some forty files I put sheets of paper in, but I can still hit the mouse key with my Zimmer frame (and several other keys simultaneously, so there are always things appearing on my screen which I eventually recognise). It also keeps me off street corners and gives me no free time to molest women, so all in all I'm an upright citizen.



Disadvantages? No, not really, except for a few bunker tours, but even they go home in the end (except for the yo-yo members, who keep bouncing back!).

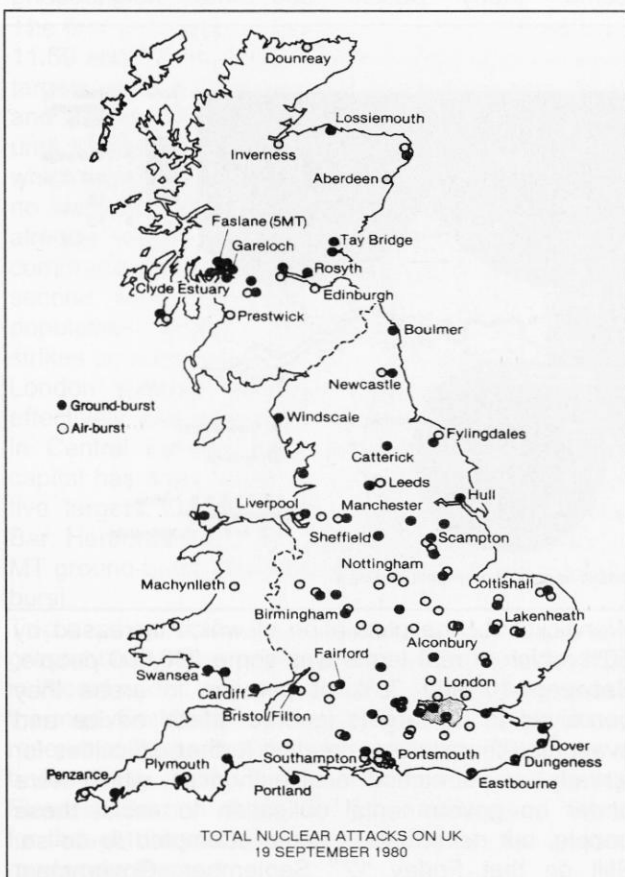
All in all, a hobby which gets you out in the fresh air, helps you to meet new faces, keeps the brain ticking over, and gets you writing rubbish like this. And at the end of August there are five Russian generals coming back to Wünsdorf to mark the tenth anniversary of the end of the withdrawal, and I shall be there!

[Any comments or questions please direct to me, no postings to the list: there's enough rubbish there as it is, and we don't want everyone to know what you don't know. Try: mailmikebarton@AOL.com. If I'm sober and not down a bunker, you may get an answer.

From Mike Barton

Operation Square Leg: Did You Survive 1980?

During the Cold War, the idea of a full-scale nuclear strike was considered a very real possibility, as illustrated by the 1980 Government and NATO series of exercises called "Crusader", which involved real mobilization. Part of this was a major paper exercise codenamed Operation SQUARE LEG. Primarily a military exercise, this involved some of the civil authorities for added realism. As well as the Sub-Regional civil officials, all Counties in England and Wales took part, as did a few Districts and all but one of the Scottish Regions. Unfortunately the exercise did not include UKWMO. As some scientific personnel remarked afterwards, had it done so there would have been an even greater degree of realism. Perhaps because this was a military exercise, it has been difficult to find very much information on Square Leg. Local emergency plans and procedures tally in with the data well enough to be able to build a reasonably clear picture of just what sort of attack we might have expected in the early 1980s; and it is not



a pretty sight.

The realism of these exercises can be debated until the cars come home, but one person who acknowledged the plausibility of the scenario was Duncan Campbell. It is difficult to say with absolute authority how accurate the scenario is, or isn't, because there is only one sure way to find out and it's not to be recommended- even by Cold War enthusiasts.

Many scientists believe that the projected casualty

figures as put forward by the Home Office at the time are far too low. Data from the United States of America is based on actual weapons tests and data from Hiroshima, and shows much higher figures. The Home Office estimates for radiation casualties also assumed that houses where people were using a Protect and Survive-type shelter were intact, when in fact out as far as blast ring D almost all structures would have broken windows, doors blown off and smashed roofing tiles to contend with. Recently someone remarked to me that Civil Defence planning has an air of hopelessness about it. One quote from Gloucestershire's post-strike diary, at fourteen days post-strike, involves a request for military assistance to quell a disturbance involving eight thousand people. Twenty-five troops were "deployed"; would they last very much longer than their ammunition?

I have found more material concerning London than the UK as a whole. However, any major city or town that became a target would be facing an almost identical situation. So, how did officials envisage it all starting, and what would we be hit by?

The Warsaw Pact used to hold summer exercises in which it would mobilize its forces forward towards the Iron Curtain, halt not far from the border, exercise and return to their bases. According to the scenario, a lot of us are now dead because:

In January 1980 the Warsaw Pact, which had just come under new leadership, mobilized its forces in a pattern very similar to their usual summer exercises- but on this occasion, they remained close to the frontier. In April the USSR demanded that Norway and Denmark withdraw from NATO. This was obviously unacceptable and diplomatic relations soured, quite quickly, as tensions began to rise. Public reaction in Britain was calm, almost non-existent; this was certainly not the first time East-West relations had deteriorated. This diplomatic tension continued throughout May, June and into July.

By August it was clear that the level of threat was real; and NATO commanders declared a state of military vigilance in anticipation of a possible war.

At this time reserves and reinforcements were mobilized, and this was when the civil defence planning and preparation began, albeit at a covert level. A very few senior key personnel occupied the SRHQs. At a local level, the County and District authorities began to prepare for a possible attack. At this time the preparatory work was not made publicly obvious; partly to avoid unnecessary alarm and at this time it was still hoped that a diplomatic solution could be found to the crisis. It was also felt that there was a risk that obvious preparation could precipitate an attack.

UKWMO was briefed and started to make themselves ready, and in early to mid-August activities became more public as no diplomatic solution was forthcoming. London and other major centres cleared the hospitals both of almost all

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patients and of many staff, leaving only a skeleton service in order to make way for expected casualties. This caused some protests by patients, their families, and indeed local authorities who found that pressure on care home places was increased. All relevant departments, at a local and national level, were instructed to review plans for transition to war at this point. SRHQs were now fully ready and the local authority emergency centres were also readied, in many cases under town halls and occasionally conversion of basements of municipal buildings. Petrol rationing came into force on Saturday 16th August, and this led to massive queues on petrol station forecourts- this would have been rather like the fuel protests of 2000. Police had to be brought in to stop people trying to hoard petrol. The movement of art treasures into safe storage and away from London began on Wednesday August 27th. There were a lot of problems on Sunday 31 August, when there was a lot of unrest among far left- and right-wing factions with anti-war demonstrations in several major towns. There was some violence and some resentment of the heavier than usual police presence in the view of the need to control subversive or potentially subversive persons. There were a large number of arrests under the emergency powers and in Stafford and other parts of the West Midlands, there were arson attacks on industrial sites and a supermarket; and troops were called in to assist the police. No shots were fired. By the 1st September the ports along the Channel, especially Dover, reported

large numbers of expatriate Britons returning home from the Continent. The first address by the Prime Minister was made by TV and radio on Sunday 7th September.

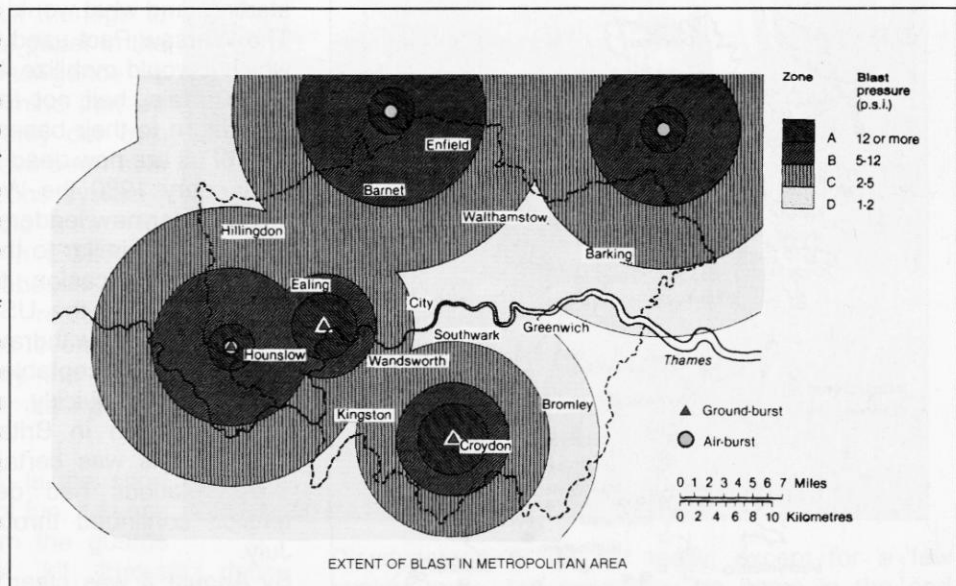
British Airways and national shipping and ports were requisitioned by the Government on Tuesday 9th September, and that Thursday 11th September another address to the nation was made by the Prime Minister.

On Friday 12 September, Cabinet approved Queen's Order No. 2. Parliament was effectively dissolved and the Government was granted the emergency wartime powers. It was at this point that there was a wave of panic buying in the shops, associated with a steep increase in prices, and civilian non-essential telephones were disconnected.

Protect and Survive leaflets, which were already available at libraries and through HMSO, were

distributed to all households. The radio and television versions of these instructions were broadcast at this time, and those householders who intended to follow the measures began to do so. Industry suffered a noticeable rundown and certain authorities began direct food purchasing. Buffer Depots and other key points were placed under guard.

The Essential Service Routes were designated and closed off to the general public. Not all local authorities had existing plans and in some areas there were difficulties in maintaining this. In Epsom, Surrey, the local council adapted the traffic plan that was used on the day of the Derby. Other areas were more or less making it up as they went along. Police Support Units, PSUs, were deployed and brought into use. The Birmingham area was particularly problematic as a large number of people did attempt to flee the city; the Essential Service Routes were kept clear but minor local roads were hopelessly jammed and some were still that way when the attack came. Many people fled into neighbouring



Warwickshire, the population of which increased by 50% which in real terms was some 200,000 people. Between 10 and 30% of persons in areas they perceived to be targets ignored official advice and evacuated themselves, creating further difficulties for already over-stretched local authorities, which were under no governmental obligation to assist these people, but nevertheless some attempted to do so. Still on that Friday 12th September, Government departments, the police and many local authorities received a very large volume of enquiries from civilians who wanted to offer help in civil defence. Unfortunately a lot of local councils rejected these offers despite Government policy of encouraging them to accept and utilise civilian help. That said, in some other areas desertion had become such a problem among local authorities' own staff that civilians with relevant skills were taken on. On the

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Saturday, the 13th September, there was a third national address by the Prime Minister.

On the following Monday, the 15th September, war was officially declared between NATO and the Warsaw Pact. There were a few conventional bombs deployed on some defence-related targets and unfortunately this caused some civilians to panic and flee the areas they perceived to be at risk. A large number of people who lived in high-rise buildings also left their homes. Industry was seriously affected and in that afternoon a decision was made to close all schools nationwide with immediate effect.

By Wednesday- the 17th- the conventional fighting on the European mainland was escalating. In the UK public transport was running at only 50% capacity. The local authorities were ordered to man their emergency HQs and the SRHQs were also manned. The worsening situation culminated in satellite and Fylingdales's detection of missile launches and the sounding of the Attack Warning Red at 11.55 on Friday 19th September 1980.

The first salvo of missiles arrived on the UK between 11.59 and 12.10, during which a great many military targets were hit, along with many communications and a few civilian targets. Nothing further happened until 13.00 when there was a further strike on the UK, which continued sporadically until 15.00. There was no warning of the second strike as Fylingdales had already been destroyed; by this stage also communications were in considerable chaos. This second wave of strikes mainly concentrated on population centres, industrial targets and repeat strikes on some areas hit in the first wave.

London suffered immense collateral damage and effectively was destroyed. There was no detonation in Central London itself, but the periphery of the capital has been struck by six weapons deployed on five targets: Ongar, Essex: 2 MT airburst; Potter's Bar, Hertfordshire: 3 MT airburst; Croydon, Surrey: 3 MT ground-burst; Brentford, Middlesex: 2 MT ground-burst.

Two missiles hit Heathrow; a 2 MT airburst and 1 MT ground-burst. The consequences of the three strikes in West London were devastating, wiping the area off the map. For those familiar with the area, some of the reservoirs adjacent to the M4 (and today's M25) were boiled partly dry by the thermal flash alone and the Elevated Section of the M4 was blown away. Food for thought the next time you are stuck in the current roadworks there.

The entire Greater London area fell within the fire zones, and for the most part also within the actual blast rings. The map of the fire zones is a worst-case scenario; if all the fire zones were to merge into a conflagration then this is the likely extent of destruction. It may not actually be as severe as this, but this is as bad as it could get.

Elsewhere some of the most serious strikes were two 5-MT ground-bursts on the Clyde Estuary and

Canvey Island. Dover was destroyed by a 1.5 MT ground-burst and the then Southern SRHQ was very close and in the line of fall-out. Strikes were also been reported on nuclear facilities at Dungeness, Dounreay and Windscale (Sellafield), all of which would create massive contamination.

In Metropolitan Sector, taking the effects of blast and radiation only, the casualty figure- rounded to the nearest thousand- was between 4 million 503 thousand dead and 765 thousand injured [overoptimistic Home Office figures] and 5 million 351 thousand dead and 464 thousand injured [more accurate figures] by the end of eight weeks allowing for the delayed nature of radiation sickness. These figures are extremely difficult to grasp because of the sheer numbers. However, in order to try to illustrate this, it may be helpful to use the following ratio which I refer to as "Scale 14". If you think of fourteen people known to you; with these figures if those same fourteen people had been in the London area at 11.55 at the Attack Warning, then:

Out of those fourteen two will be dead, and four more will be injured. Another one will be injured and trapped in debris, and will die. Another will have been fatally burned by the heat flash alone and will not survive.

Six more will escape the blast but be endangered by fire, and some will be killed.

Within a few days all the surviving people will be suffering from radiation sickness. If the All Clear were to be sounded after fourteen days (which would be Friday 2nd October 1980), out of the remaining five or six people three or four will have died from the effects of radiation, and therefore two weeks post-strike, out of your fourteen counted individuals only two or three will still be alive. Scale 14 is based on the 1980 population figures and does not relate to fourteen people reading this: it relates to fourteen people known to each reader.

It would not be possible to extricate those buried under debris regardless of whether they were alive or dead, and owing to vaporization and incineration there would be no trace left of a great many people. So, even in the long term, the total casualty figure would at best only ever be an educated guess. But from the total 125 strikes, the tentative figure is 29 million dead nationwide and 6 million 350 thousand injured. These figures are rounded to the nearest thousand and are based on most persons being in their place of residence.

Initially the bunkers would remain in lockdown and the general population advised to remain in shelter until further notice. Law and order would be one of the greatest difficulties. Although all peacetime laws would still apply along with the emergency powers, in these circumstances extreme measures may be the only option. The military would assist in this aspect.

Assistance for injured survivors would be the Casualty Collecting Centres, but these would be very limited and the three-category triaging system would

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be enforced. Persons in Category 1, who will recover without treatment, and Category 3 who have little chance of survival owing to irradiation or whose injuries are extensive, will not receive medical help. These persons will respectively be turned away or held at holding centres; however there will be no treatment afforded to them. Those in Category 2, who stand a good chance of recovery after the limited procedures that will be available, will be admitted to hospitals and medical facilities. These "limited procedures" would basically comprise no more than 30 minutes of surgery and only very basic drugs. Those suffering from radiation sickness only are not treated. While the system appears- and is- very harsh, drugs and medicines (and also medical staff) would be in very short supply and must not be wasted on those to whom there would be no benefit as they could not be saved in any event. Should the situation in some areas become very desperate, then persons in Category 2 may have to be sub-divided and prioritised according to a further set of criteria; e.g. their age, their skills, or whether they have viable families to raise. On the exercise, Warwickshire prioritised those under the age of 30. This further aspect of triaging is the responsibility of local controls; realistically most casualties would not receive any help. The preferred minimum ratio of Casualty Collecting Centres was one per ten thousand of pre-strike population. It was hoped that more would be set up; in any case they would not be mobilized until the fall-out situation improved. People were informed that this would be the case in the Protect and Survive advice- immediately after an attack we were very much on our own.

The rules that would be in force post-strike are not at all of the order we would be used to under peacetime conditions. Martial law would be in force throughout the state of emergency and many aspects are very harsh when judged by peacetime standards. Executions for the gravest offences may well become commonplace.

The military would be largely responsible for assisting in the maintenance of law and order and in particular guarding of internment areas, support and protection of Special Courts and the execution of sentences. The police, working with the military where necessary, would continue their additional tasks assumed during the period of tension, such as control of Essential Service Routes, prevention of looting, and maintaining security of food and fuel supplies. They would also assist at a local level with protection of the public against radioactive fall-out, handling and resettlement of homeless people, and emergency feeding arrangements.

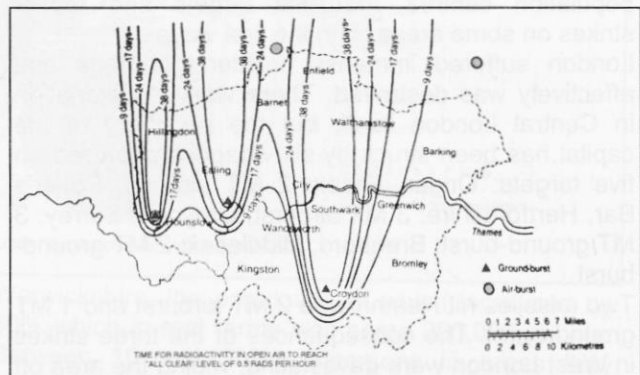
Priorities for the recovery phase were:

- Enforcement of law and order
- Road clearance of Essential Service Routes
- Assistance with food and water distribution.
- Emergency Sanitation Measures

• Disposal of Human Remains

These last two measures would be essential to prevent the spread of disease, but in practice the amount of damage would be insurmountable. The usual workforce would be drastically depleted by deaths, serious injuries, desertion and using up the wartime emergency dose, although it is debatable whether the emergency dose would be adhered to. In any event, within a very short space of time workforce would have to be supplemented by civilians requisitioned from their households, by force if necessary. Those assisting would be given the incentive of greater rations than non-workers.

Over half of the country was affected by fall-out; the All-Clear was to be sounded in localities when the radiation level reached one half rad per hour. This is still a very high dose and people would have to remain inside for six to eight hours daily; exposing them to around ten rads per day. In some areas downwind of the ground-bursts it may take as long as 38 days simply for the radioactivity to reach this level. The borderline for manifestation of radiation sickness is on average 200 rads. The radiation level in some of these areas is so high that many people would be killed even if they did not come out of shelter, and unfortunately there is nothing that can be done about this. Before the All Clear levels are reached, advice would be given in local areas concerning going outside for short periods of time for essential tasks. These short periods of time are initially measured in minutes; to be extended when possible.



Realistically people would not tolerate this amount of time in their shelters and are highly likely to emerge in spite of the advice given. Those that did come out may well have to fend for themselves if it were deemed too dangerous to allow police or military into the area to control them. The post-strike scenario of suffering, anarchy, disease, devastation and martial law really does not bear thinking about.

Had it been for real, the strikes of Operation Square Leg killed half the then population of the country. I would not have survived the onslaught, but I for one would not have wanted to face such a terrible future as that depicted for those that did.

Jane MacGregor

ROC Survey reaches the end of the line



Nick Catford recording the final post in the ROC Survey at Port Ellen on Islay.
Photo by Mark Bennett

Unfortunately even some of Neville's grid references are wrong so there are still a few posts where I can't be sure that I have found the correct site.

Before each excursion, I spoke to Neville to see if he had a more accurate NGR for the posts I intended visiting, often he had. I also visited the British Library to consult large scale (1:2500) OS maps from the 1960's - 1980's, many of which show the posts and confirm the location. Unfortunately many are not shown.

If there was no evidence of the post at the site it was then necessary to ask local people, contact

After nearly eight years and thousands of miles the survey of 1563 ROC underground monitoring posts finally came to an end on Monday 16th August when the last post site was visited at Port Ellen on the Island of Islay off the Scottish west coast.

It has been a labour of love for me and has given me the opportunity to visit every corner of England, Scotland, Wales and Northern Ireland. I have seen some spectacular scenery and climbed countless steep hills often with nothing at the top as a reward.

I am pleased to report that well over half the sites visited still have an ROC post in some form or another. Many are still locked and in good condition while some are badly vandalised, trashed, flooded or burnt out.

I guess it's debatable whether the survey was worth all the time and effort and thousands of pounds in petrol, air fares and hotel costs. I think it has been a worthwhile project and Sub Brit web site statistics consistently show the ROC to be the most visited part of the web site.

In the early days I travelled alone to most sites on my trusty motorbike but as sites got further away it became necessary to travel by car, often staying over night.

I am sure there will be mistakes in the survey, that is unavoidable. I used the post list in Attack Warning Red as the basis for the survey. It lists each post with a grid reference.

Unfortunately at least 30 posts are missing from their list altogether and many have an inaccurate or completely wrong grid reference.

Without the help of Neville Cullingford at the ROC Museum at Eastleigh I wouldn't have found the correct grid reference for many of the posts.

local libraries, history societies etc. to see if the site could be positively identified. Quite a lot of posts were later found by doing this but I'm sure there are still some that will be located.

So although the survey is now complete I'm sure there are still a few extant posts to be found.

I am pleased to report that in the last two years, a number of posts have been restored or are in the process of being restored and several of these are already open to the public on an occasional basis. A number of posts are owned by Sub Brit members.

I would like to thank a large number of people who helped with the driving, always on a shared cost basis. Even sharing the cost, it was still very expensive, especially with ferries to the Scottish islands with sometimes only one post site to visit.

I have listed all the people below who provided transport. They are in alphabetical order and I hope I haven't missed anyone out - apologies if I have. Your help, time and company has been greatly appreciated.

- | | |
|-------------------|------------------|
| • John Anderson | • Charles Parker |
| • Martin Briscoe | • Bill Ridgeway |
| • Richard Challis | • Steve Sanders |
| • Roy Coulter | • Andrew Smith |
| • Wayne Davies | • Robin Ware |
| • Andrew Denyer | |
| • John Fogg | |
| • David Grindlay | |
| • Mike Hawkins | |
| • Jim McNally | |
| • David Miller | |
| • Dougie O'Hara | |

From Nick Catford

Femöre Fort - Sweden

Femöre Fort is located at Oxelösund. Oxelösund is a coastal city on the Baltic coast of Sweden, 110 km south of Stockholm. Since the late 19th century it has been one of the most important harbours in the Baltic, due to its large iron and steel works. Because of the harbour's importance, it was decided that a coastal artillery site was to be built on the island of Femöre at the start of the 1960s.

The fort is both a Cold War Coastal Artillery Battery, with a protected underground control and command centre, and a Radar Post. It is number 3 in the series of 30. Building began in 1961 – with the first battery ready for action in 1962 – and was completed in 1963. End of service was said to be 1975, whereas battery number 30 was completed in that same year. It was restored in the late 1980s and used for training until 1994. The last time the guns were used was during training in 1990. Armaments comprise three 75mm Bofors Type 57 guns specially manufactured in 1957 and designed for Cold war coastal defence. Conventional old-style conflict naval guns have a maximum elevation of 45-degrees; later Cold War guns, 20-degrees, thereby reducing the risk of damage during a nuclear strike. The guns had a range of up to 13 km in a 360 degree arc of fire. Two types of ammunition were available: one for ship targets, with a delayed explosion after the round has penetrated the ship; and conventional ground shell, that exploded at impact or with a timer delay after it was fired. These could be used as air burst rounds, sending shrapnel over enemy troops below.

The turrets were protected by 70mm thick steel plate. They were NBC protected as was the rest of the fort. It was built to survive a Hiroshima-power bomb 200 meters away. The turrets had two states of readiness: Battle readiness, when the barrel was pointed out to sea; and Nuclear readiness if a nuclear attack was likely, in which case the barrel was fixed horizontally onto an anchor point ensuring the turret would not move with the shock wave.

The turret was crewed by three men, with a further four down below with the shell elevator enabling a possible maximum firing rate of 25 rounds per minute. However this was never used, as the tactic was to fire 5-10 shots, evaluate the accuracy and fire again. All three turrets shot at the same target, as controlled from the COMCEN (command centre.) The shell lift elevator (bringing the shells up 9 metres)



No.1 gun looking out across the Baltic Photo by Nick Catford

was the only thing needing power, therefore there was a stand-by manual winch also present.

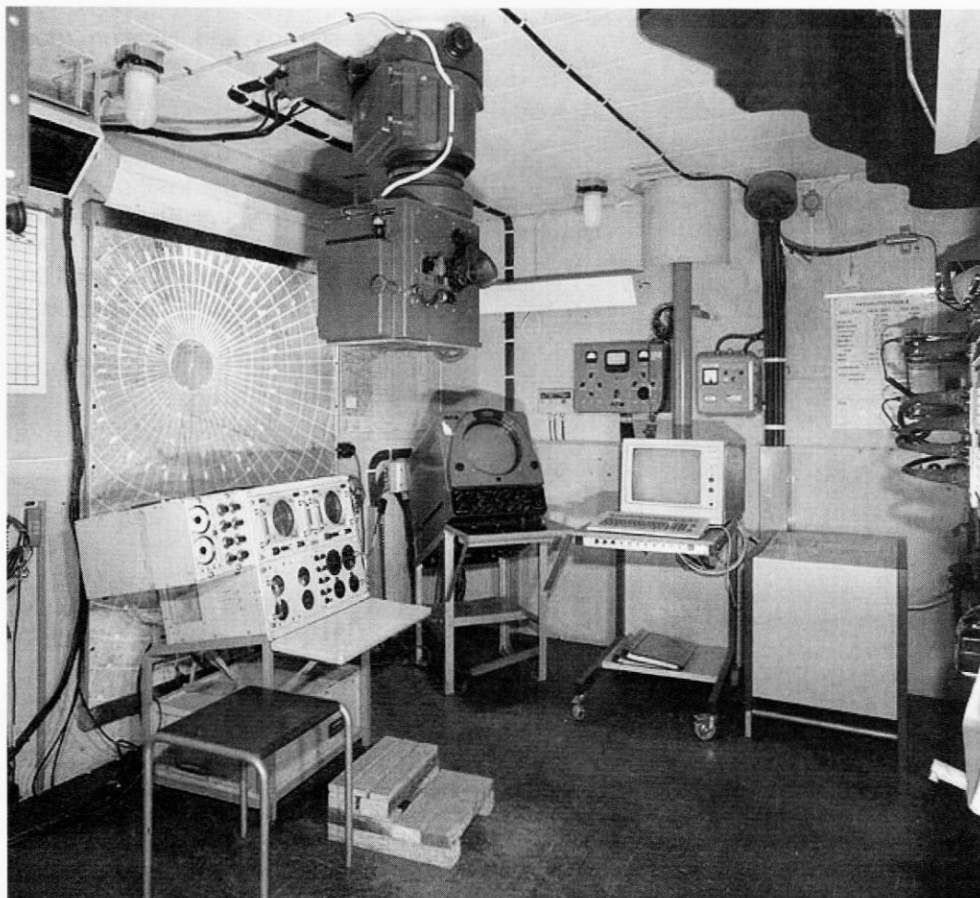
The fort is a self contained unit, with a full contingent of 70; 10 officers and 60 men. It was self sufficient for 30 days. There were an additional 30 infantry soldiers above ground whose role was to provide all round defence and protect the external parts of the fort from enemy forces.

Sited on a small island, within the rock (granite) on the edge of the cliff, the function of this underground fort was to protect the inlet and, of course, therefore Sweden from a seaborne assault by Warsaw Pact countries. The fort's weapons were designed to combat lightly-armoured landing craft should they get within the guns 13km range; they could also inflict minor damage on destroyers and other larger vessels. The guns could be rotated a full 360° and could fire on land targets if required. Other coastal batteries elsewhere on Sweden's coastline employed larger calibre artillery for use against heavily armoured vessels, with an extended range of 20km.

The fort was one of 30 other 75mm gun installations around the coast. Six were the same as Femöre Fort, and had a central spine tunnel linking all the areas and turrets. The rest had three separated turrets, plus an underground command centre (COMCEN) linked only by telephone. Each unit had its own kitchen, generator, sleeping accommodation etc. These six had the designation 'First Series', the other 24 'Series 2' and 'Series 3'.

Sweden and Norway were the only countries that built Cold war Coastal Defence Nuclear Bunkers. Sweden built them from 1961 to 1980. As Femöre

Femöre Fort - Sweden



Command Centre with the periscope for the battery chief, plotting map on the wall and one of the two radar screens in the centre. Photo by Nick Catford

Fort was being built (1961-1963), the UK was stripping its out. The forts were NBC (Nuclear, Biological, Chemical) proof, and were self-sufficient for up to 30 days.



Bunks in one of the SK10 Shelters Photo by Nick Catford

Around, and inside, the perimeter of Femore Fort are a multitude of two-man fox holes, with an underground shelter attached. In addition to these, there are two large SK10 shelters; 'S' meaning shelter, 'K' meaning arch, '10' men. The shelters (bunkers) are large enough for 20 men sitting, or 10 sleeping. They offered protection for the infantry soldiers outside the fort, tasked with defence of the bunker area. There was a wood/coal heater in each [attach diagram] and a curtain across either end of the two entrances in the entrance tunnel to prevent the inside lighting being seen from outside. Normally, the soldiers would use tents – the heavy duty Swedish heated tents necessary in the

extreme cold experienced in Scandinavian winters – but in the event of a conflict, the SK10 shelters would come into use.

The large underground battery has an entrance tunnel, complete with many heavy blast doors. The tunnel drops down in level instead of a dog-leg for blast damage reduction. There is a glass 'porthole' in one of the blast doors in order to see along the corridor. There is a spare radar head stored in the entrance corridor.

The decontamination showers are located in an airlock within this tunnel. This leads in turn to a 450-metre central tunnel, off of which are the three gun emplacements, radar post, main command centre (COMCEN), and reserve command centre at the western end of the fort where the Fort's Second in Command would operate. The whole complex was constructed within a granite outcrop, tunnelled by civilian mining engineers using standard mining techniques – rock drills and blasting. Work began in 1961 amid great secrecy and continued through to 1963. The area which formerly had been a public access nature reserve was summarily closed during the construction phase. The entire installation is built above sea level, with its main entrance to the underground fort cleverly and convincingly disguised as a house.

Femöre Fort - Sweden



The entrance to the fort was disguised as a house. The entrance is through the fake 'garage doors' on the lower level. Photo by Dan McKenzie

To provide for the basic needs of the occupants, there are two bore holes for water; one for salt water (toilets, and showers in emergency), and one for fresh water. There are two Volvo diesel generators, each with approximately 970 hours showing on the clock, supplied by two 20-cu metre diesel tanks (20,000 litres each) giving 30 days continuous use. They would cut in as a result of a power failure from the grid, and one of the generators could supply all of the fort's power requirements. They were however to be run in tandem to reduce the load on the generators. The kitchen could cater for the full contingent, plus the 30 soldiers outside, using a large potato peeler, an even larger food mixer/bread maker, cooker (steam), massive refrigerator, and large larder/food store. There are two toilet blocks (male only) and two shower cubicles; with separate WC cubicle room for kitchen staff, to stop any chance of infections or diseases being passed through the fort. With six bays of ten triple bunks, each man had his own bunk.

Within the fort there is a sick bay, officers accommodation, Senior officers room, telephone room, encryption room (next to Senior officers room, with a hatch for passing confidential messages), various storage rooms for food and spare parts, a large common room / dining area is at the centre of the fort, a workshop with machine tools for engineering repairs of the fort and its guns, a full air conditioning and filtration plant room, a drinking water

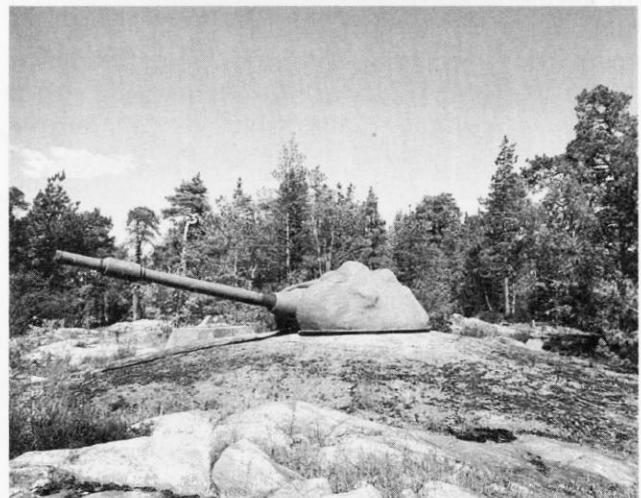
storage and filtration room which also contains the fire detection system. There is an emergency exit leading off of the main spine corridor up to the surface via a spiral staircase and multiple blast doors.

On the surface above the western command post is a protected concrete tower housing a fully functioning laser range finder. The tower was first equipped with a stereobinocular system. In the 1970s a laser range finder was added. This laser range finder would have come into play if the radar was put out of action. In the 1970s a laser was installed to give an even more accurate distance to target measurement. This tower was the most western part of the fort, and is connected by the long spine tunnel.

Here the 2nd in command was placed as a stand-by for the Commanding Officer in the battle control.

There is also a large wooden 'shed' containing the radar for the site. The shed was an original feature of the site as it was needed not only to provide camouflage but also to protect the radar from the harsh winter climate. All the control gear for the radar is still in its original place in the bunker.

The surface turrets had fibreglass camouflaged covers over the guns. The guns were manufactured



by Bofors in 1959 and were equipped with newly developed smoke extractors on the barrels. These

Femöre Fort - Sweden

devices ensured that fumes were extracted to outside rather than pollute the (sealed) air inside. Each of the working turrets was linked by semaphore so that targets could be accurately pinpointed by the range officer. There were also at least two periscopes used on this site, both of which are still fully functional. A common problem in the severe Swedish winters was for the glass on the periscopes to freeze over, thus



Sören Häggroth, the director general of Swedish National Fortifications and local authority commissioner Benita Wikström jointly cut the ribbon at the end of the handing over ceremony Photo by Lars Hansson

making them useless, so they were fitted with fine wire heating elements on the internal surface of the glass. There were also various lightweight metal dummy 'Bofors' guns, which were heated and could be rotated, sited around the fort to fool the enemy's satellite cameras and thermal imagers, giving the impression of further weaponry. There was also a fake radar situated in the nearby lighthouse to draw attention from the real one. Having laid derelict for eight years a number of local enthusiasts put forward a proposal to develop the fort as a tourist attraction. Although some equipment had been removed by the military authorities the fort was still largely intact so an 'open house' weekend was arranged for the local



Tony Page representing Sub Brit at the handing over ceremony on 1.6.2004 - Photo by Lars Hansson

community over the weekend of 17/18th August 2002. Although there was some opposition to the proposal both from the community and the military, the open weekend proved a tremendous success with the expected 1000 visitors soon exceeded. By the end of the weekend over 2100 people had visited the fort with more than 1200 signing a petition asking for the fort to be saved.

It was agreed that a further series of more widely publicised open days should be arranged for 2003 before the local authority would agree to take on the responsibility for the fort. Although all three guns remained in place all the machinery below Nos. 1 & 3 turrets had been removed and the rooms stripped back to bare walls. Even the spiral staircases giving access to the turrets had been removed

The tunnels leading to these two turrets and the standby command centre at the western end of the fort were therefore sealed off by the military authorities and arrangements were made to hold a series of open weekends through the summer of 2003.

Again visitor numbers greatly exceeded expectations and the Föreningen Femörefortet Association that had been formed to run the fort gradually began persuading the remaining people opposing the scheme that the proposal to open the fort to the



public was viable. The local community agreed to buy the fort for a nominal sum but insisted that it would have to be totally self financing with no public money being put into the venture.

On 1st June 2004 the fort was handed over to the community in a ceremony attended by many local dignitaries, military personnel, two TV crews and four members of Subterranea Britannica. The highlight of the day was a low level fly-past by a JAS 39 Gripen of the Swedish Airforce which flew 450km from the airbase at Ronneby, flying over the fort precisely on time at 13.20.

The Association now has access to all areas of the fort including tunnels that had previously been sealed, although these areas have been stripped of all fixtures and fittings and have no lighting and will not be part of the public tour.

If the Association are unable to attract sufficient tourists to pay for the upkeep of the fort the museum will be forced to close and the local community will find other commercial uses for the site.

From Tony Page

Chislehurst Caves

Chislehurst is one of the few underground systems within the M25 open to the public, and is a must for anyone visiting the area. Back in January when I was privileged to be invited to a KURG trip to Emmer Green chalk mine, I mentioned how good it would be to do a 'Non-tourist' trip to Chislehurst. Very soon I was put onto Rod Legear of KURG, and a joint Sub Brit WCMS trip was arranged. The trip filled up very quickly, although on the actual day many Sub Brit members were involved in a desperate effort to locate a shelter in Epsom and were unable to make it.

We met up with Rod and entered the "caves", where some marvellous (and of course factual) re-creation of the system's WW1 and WW2 use has been added since my last visit. There is now the original ticket office (one poignant feature on the rules of the system as an air raid shelter is that if you were absent from the shelter for 4 nights in the Blitz you were assumed killed and your place was given up).

Also re-created are the chapel (actually consecrated), first aid posts, Citizens Advice Bureau and some cramped and basic dormitories.

In addition to the main tour we were able to examine one of the shafts up to the surface and the old wartime cinema. A recent feature is an extremely complex and artistic sculpture in the chalk wall. When I last visited in 1988 it was possible to do a longer tour of the whole system on Sunday afternoons, although the Southern areas has now been walled off from the main system and is leased exclusively for "Dungeons and Dragons" role-play games and has

apparently been considerably painted and altered. Here is a comparison of both the fanciful and the actual commentary which Rod provided us with, using the available publicity literature:

- The famous labyrinth of caves known as the enigma of Kent - A chalk mine
- Three areas of mines worked by the Romans, Druids and Saxons - Well actually all Victorian
- 22 miles of mysterious passages - Well maybe 2
- Hewn out of the chalk over a period of 8000 years - Or about 1840
- The Cavaliers passage used to shelter from the Roundheads in the Civil War - An access tunnel for mushroom growing
- The Druid altar where young children were sacrificed and the blood collected in gold chalices - A miners' bench to allow miners to take chalk out of the ceiling.
- The Haunted pool where a man drowned his young bride and her ghost still haunts the passages - The WW2 Gents toilet.

All in all a very entertaining and informative tour, and a big thanks to Rod for leading it. If anyone who missed it is interested, public tours may be arranged via <http://www.chislehurstcaves.co.uk>

...and a historical description may be found at: www.kurg.org.uk/kurg/11_chalkmines.htm

From Martin Malins

Invisible Worlds Beneath our Feet

The article is for a paper called Hamodia that is distributed in Israel, USA and England with a total distribution of about 35,000. It was written by one Avraham Broide.

A few years ago I was passing a gigantic pit in Meah Shearim that would one day house the lower stories of a vast yeshiva building. Staring into its depths, I reflected that there is a vast, invisible world beneath our feet and that the earth's crust is as riddled with caves and tunnels as a slice of Swiss cheese. Most such places remain out of sight and mind until they are forcibly brought to our attention – like the eight or nine Rafiach tunnels in Aza that are currently driving the Israeli Army insane.

A Short History of Tunnels

As a true armchair strategist, I was always puzzled why the Israeli Army is having such difficulty searching and destroying the Palestinian tunnels because they are by no means a new phenomenon. The Arabs have been using them to dislodge infidel

fortifications since the Crusades. One instance of this is when King Baldwin of Bolougne, the Crusader King of Jerusalem (1100-1118) holed himself up in the Lebanese Quardapiert Fortress. To smoke him out, the Turkish prince Balak ordered his men to dig deep into the fortress's hill and shore up the excavations with beams and branches. Afterwards the combustible material was set on ablaze and the fortress tower above crashed down, allowing the Turks to swarm in.

Some time ago I bounced over a rutted dirt path to visit the Belvoir Castle south of Teveria that narrowly escaped a similar fate. Belvoir is the best preserved Crusader castle in Israel and I marveled at a huge rain water cistern dug in its bowels that helped Belvoir hold out during a year-and-a-half siege in 1187 when it was the only Crusader stronghold left in the Holy Land. Saladin's attempts to undermine its walls with tunnels failed because the walls were reinforced with iron and lead joins.

Hundreds of years later the old tunnel technology

Invisible Worlds Beneath our Feet

was used on the Western Front during World War I with explosive effect. Miners spent weeks and months tunneling beneath enemy trenches while each side desperately tried to detect the other side's efforts. This was sometimes done by driving a stick in the ground and holding the exposed end in one's teeth to feel underground vibrations. Another method was to bury a water-filled drum at the bottom of a trench. Then soldiers took turns plunging their heads underwater to listen out for suspicious noises.

On at least one occasion, British and German tunnels converged and miners fought hand to hand underground.

Till this day, visitors in Spanbroekmolen, Belgium can view the results of the largest mine of them all. On 7 June 1917, 19 mines were exploded during the Third Battle of Ypres. Hundreds of tons of earth flew skywards 300 feet and more and the sound of the explosions that killed 10,000 men was heard all the way in Downing Street, London.

The largest mine used was a 91,000 pound explosive charge placed under the German lines on Messine Ridge. The crater it produced left measured 430 feet from rim to rim and it has since been transformed into the 40 feet deep "Pool of Peace."

A Failed Investigation

In conclusion, I was puzzled that the technology and might of the Israeli Army has failed to locate and destroy a few primitive tunnels. My efforts to solve this riddle led to a dead end because the details of the IDF's tunnel campaign seem to be a well kept secret. I phoned the office of the IDF spokesman and was informed: 1) Because of the tunnel explosion last Sunday it was doubtful if anyone could speak to me at all. 2) I would categorically not be given an interview with soldiers and engineers involved in the tunnel operations.

After a day or so I was put in contact with a spokeswoman from the Southern Command and I asked her why the tunnels can't be located using simple ultrasound detectors and destroyed by simply digging down into the Philadelphia Road. Why all this constant searching and incursion of the army into enemy held Rafiach?

I got no real answer to my questions. She confirmed my suspicions that Israeli techniques are a closely guarded secret and that the current Arab technology remains pretty much unchanged since the days of the Crusades. Their chief excavating tools are spades and pickaxes.

She admitted that the army's chief method of locating the tunnels is through informers. Without their information finding a tunnel is almost impossible because a soldier could stand right on top of a tunnel entrance and be none the wiser because the entrance holes are often cemented up and floored over between each smuggling operation.

Meanwhile the eight mile Philadelphia Road remains a war zone where the Israeli Army has faced more attacks in the past year than it suffered for 18 years during the Lebanon Occupation and the Rafiach Tunnels continue to function as the oxygen supply of the Palestinian Intifada.

Underground Engineering

Ironically, the primitive Rafiach tunnels have proved to be more effective than the most ambitious military excavations ever dug that were never used at all. These include a mysterious military base dug deep inside a mountain near Bluemont Virginia, 46 miles from Washington DC that was reportedly meant to be an emergency relocation place for the President and top government officials brass in the event of nuclear war.

In England, a disused stone quarry in Corsham, North Wiltshire used as the world's largest underground factory in the world to make aircraft engines during World War II, was converted into "Burlington" – one of the Emergency Government War Headquarters of England. With its two million square feet of underground space the place was intended to house 5,000 government personnel including the Prime Minister and cabinet in the event of a nuclear war.

With the cessation of the Cold War, small nuclear shelters are being rented out for secure storage. I thought a photographer friend of mine who keeps backup files of his work on three different continents was a little paranoiac until I read that since the Twin Tower attack, businesses across Britain are rushing to store irreplaceable computer information in disused nuclear bunkers. For £36,000 a year, the "Al Digital" company will house your data behind a set of five-ton, blast proof doors, gas-proof doors and a high-pressure airlock.

Other mammoth subterranean structures include the longest tunnel in the world that was built after a 1954 typhoon sank five ferry boats in Japan's Tsugaru Strait joining Honshu and Hokkaido islands, killing 1,430 victims. People began clamoring for a safer way to get across and the answer was to dig the underwater Seikon railway Tunnel 174,240 feet long (33 miles) through an active earthquake zone. Nowadays it is quicker and almost as cheap to do the trip by air and the Seikon Tunnel's chief function is to steal the limelight from the British Channel Tunnel that is over a kilometer shorter.

It is strange to reflect that 160 years ago, people were afraid to travel through the three mile long Box Railway Tunnel in England and preferred to take a detour round the mountain instead.

Nature's Efforts

Despite Mankind's massive tunneling and excavating efforts, it will be a long time before he ever outdoes the humble earthworm, ant and mole.

Invisible Worlds Beneath our Feet

Let's start with the earthworms, all 3,000 species of them. They range from a few centimeters to over 22 feet long, have five pairs of hearts and literally eat their way through the soil. In the temperate regions of the world they are the largest single contributors to total soil invertebrate biomass. Good soil can have as many as a million worms per acre (43,560 square feet) digging over 500 miles of tunnels in one week.

In other words, there are more earthworms around than all the ants, spiders and centipedes combined. Just as well that they stay out of sight! They are so important to agriculture that Cleopatra reportedly declared it a capital crime to export the creatures from Egypt and Aristotle called them the "intestines of the soil." Other expert animal diggers are members of the 20,000 ant species many of whom carry 25 to 50 times their own weight.

One of the fastest animal diggers is the Eastern Mole of the USA that can dig up to 4.5 meters in an hour with its powerful feet. One specimen dug 31 meters of tunnels in one day.

Speleomaniacs

Strictly speaking, speleology is the scientific study of caves or the sport of walking and climbing in caves. For the purposes of this article I'll extend it to all those people who love nothing better than to risk their lives exploring the eternal subterranean night of both natural and manmade structures. It wasn't hard to locate them because hundreds of speleology organizations exist worldwide. To find out what makes these enthusiasts tick, I sent off a broadside of letters asking some of them why they find underground places so exciting and to mention their most exciting and dangerous adventures.

In short order, replies arrived to every one of my letters and it struck me that these human moles must be of the philanthropic sort.

In one letter, Mike Clinch the contact man of the Kent Underground Research Group reflected something I read some time ago – the underground places of the world are the world's last frontier.

"In many cases you are the first person to have been there for a long time and you don't know what you will find," he wrote. "With natural caves you could be the first person ever. It is the thrill of discovery and there is a hint of danger and risk. The most exciting times are when after excavation you first break through into a cavity. It is difficult to quantify the most dangerous experiences because you take great pains to minimize the risks. Underground exploration is a team activity and one where you are responsible for your companions."

However, Mike admitted that on one occasion he was traveling through some half flooded caves when the water level began rising, cutting their way back. There was no option but to go on. Fortunately he survived to tell his tale.

John Smiles, the secretary of "Subterranean

Britannica" a society formed in 1974 for the "study and investigation of all man-made and man used underground places" sent me the longest reply of all.

"Man has always been fascinated with the idea of underground spaces," he wrote. "They crop up all the time in folk lore and ancient literature from Dante's Inferno to the saga of Theseus and the Minotaur. (According to Greek legend, Theseus was sent into an underground labyrinth to fight a monster and found his way out by having the foresight to unravel a ball of string behind him on his way in). What I like most is the drama of these spaces and the fact that they're hidden out of sight and rarely visited, even though they might be just beneath a bustling city street."

John wrote how he almost got lost inside a labyrinth of a different sort:

"My most exciting experience underground was getting mildly lost in a vast old limestone quarry in the South West of England. I re-found my route pretty quickly (after about an hour) but the idea of being lost in nearly a hundred kilometers of identical looking tunnels was a bit unnerving at the time!"

"My most dangerous underground experience was a simple case of bad preparation," he continued. "I was looking around an old artillery bunker built by the Nazis on the north coast of France when I was about seventeen. I had never been in anything like it before and I was navigating by the light of a lamp off my bicycle (we had stumbled on the open bunker while on a cycle tour of the region). With such poor light, and not paying very much attention, I fell down an unguarded shaft. Lucky for me it was only about three meters deep and I was only slightly injured."

After reading these letters, I began thinking that speleomania is better experienced vicariously from the safety of an armchair.

Tunnel to the Stars

It would be a pity to conclude without discussing the longest tunnel of all that would actually be non-existent in the unlikely event that it is ever built. A problem that has long been bothering scientists is how man will commute to the stars. After all, traveling at the speed of light a rocket would take 4.3 years just to reach Proximi Centauri, the nearest of them all.

One tentative solution theorizes the development of a non-existent tunnel. According to Einstein's theories, it may be possible to create a wormhole through space by warping the space-time continuum (whatever that is). This process is compared to bringing two points on a piece of paper together by bending the paper. All that is required to construct a wormhole is to create two gigantic rings of super dense matter (one near earth and one near the destination) and spin them at the speed of light.

Meanwhile, Mankind's efforts will be better spent finding a safe solution to the Rafiach tunnel crisis.

Zossen Wunsdorf-A day trip



When the idea of this trip was first mentioned, I wasn't sure if I could make it due to work commitments. But as I thought about the trip more and more I realised that I had to go, work would have to wait for once!. This is my own personal account of the day!

The evening before the flight I did not finish work until 21.30, so by the time I had got home, packed a

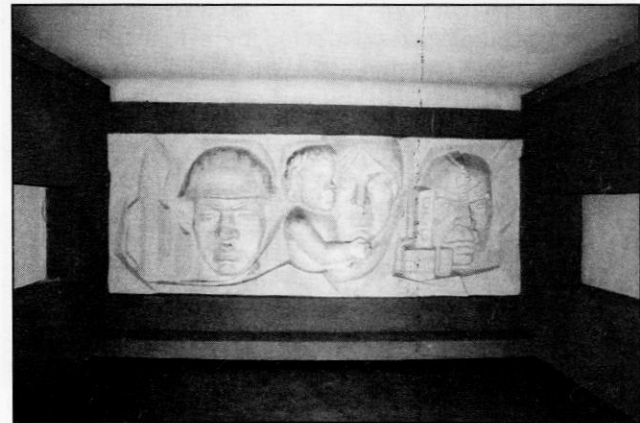
few things i.e. my camera and passport, it was time to leave for the long boring drive to Stansted. I got there about 04.00 and was amongst the first in the check in queue. Check in complete I headed off for the long walk to the departure lounge, and what a long walk it was!. After 5-10 mins of walking I found it and sat down and waited for the coffee shop to open, which it did eventually. As boarding time approached the usual bunch of Sub Brit types started to arrive in the departure lounge. Nick Catford was one of the last to arrive as the security men took an interest in his camera battery pack (a big aluminium box with wires coming out of it!). Eventually we were all on the aircraft and at some really early hour of the day we were on our way.

The flight over was uneventful and before long we had began our descent into Berlin Schonefeld airport. Passport control consisted of a glance at your passport photo, A quick look to make sure that you looked like your photo and hey presto I was in Germany!. Our coach soon turned up with Mike Barton, our man from Germany on board.. A pleasant 30 min drive saw us arrive at the main bunker museum to pick up our guide for the day Herr Bochert. Our first stop was an old admin building on the massive Zossen Wunsdorf barrack complex. As we got off the coach we were greeted by Lenin himself.

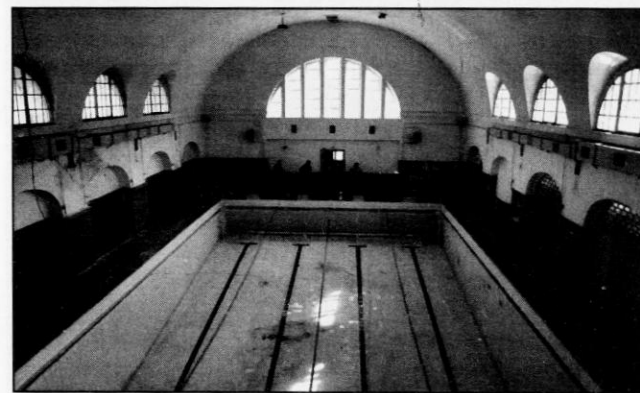
This first building had a big curved room that had once housed a diorama. This showed the Russians taking Berlin in WW2 and their route through Europe showing the victories on the way. On the wall just before this was a map showing the deposition of Soviet forces at the end of the war.

Along the corridor was another smaller room which had one wall covered with a large stone carving and the other walls had pictures showing how the Russian people had suffered during WW2. Whilst in this room I could imagine new recruits being brought in here to re-enforce the Soviet idealistic view.

The next stop was the old swimming pool. This was amazing, it was as though the Russians had just left.



According to our guide, the pool had been refurbished just before the Russians pulled out. All the tiles were intact, no graffiti was present and the only thing missing was the water. It was nice to see such a complete building as the only other Forces swimming pool I've in is HMS Royal Arthur, which has been totally vandalised.

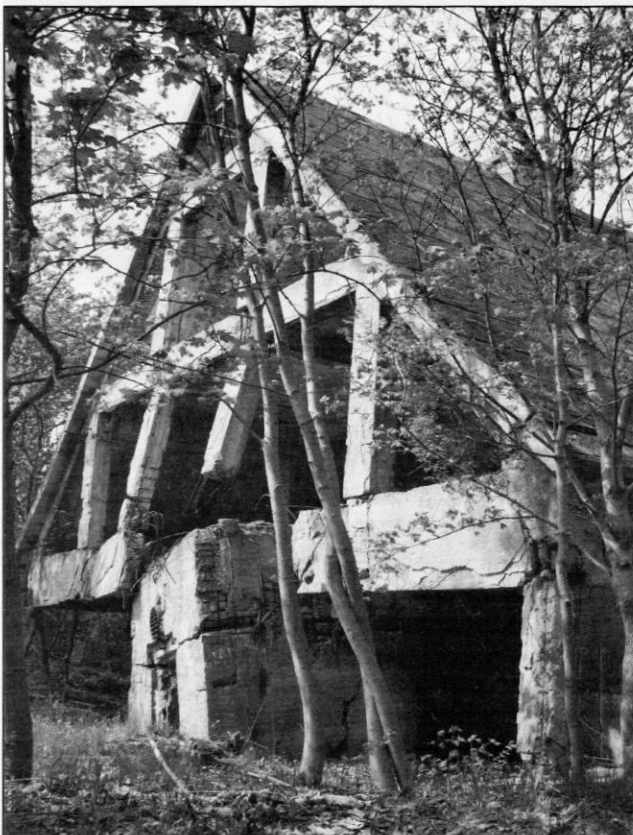


The rest of the morning was spent wandering around this part of the complex. We saw the old Camp commanders house, complete with pickled apples!!. The old tank garages where Russian armour once stood, were overgrown and derelict. This is also where a lot of the tanks etc were cut up when the Russians pulled out. It would have cost them too much to take the tanks back complete, so they were sold to the local scrap man. The old assault course

Zossen Wunsdorf-A day trip

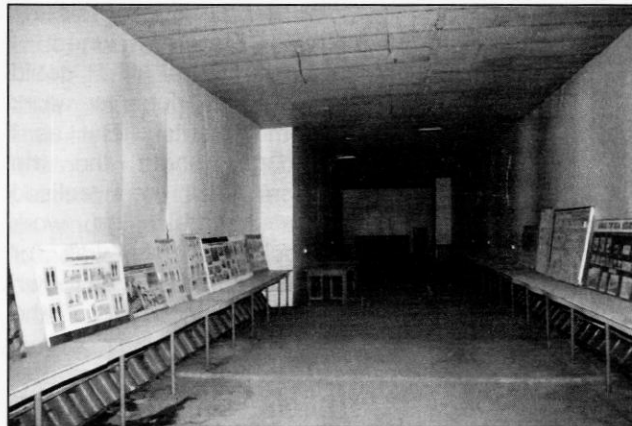
was still in place as well. All in all the Admin bit of the barracks was an awesome place. It must have been very intimidating being a new conscript in the Russian army and finding yourself posted here. Driving back past the entire complex gives you an idea of just how big this place is. From end to end it must have been 2 miles long. A lot of the buildings have been turned into cheap housing for the local population. Next stop was lunch and then after that it was bunker time!!.

After lunch we all met up inside a locked gate and Mike gave us a quick run down on what we would be doing. The walk to the first bunker took us past some of the Maybach bunkers. These were a series of surface buildings all connected by a tunnel. These are impressive structures and the Allied forces at the end of the war tried to blow them up, but failed, as the picture below shows.

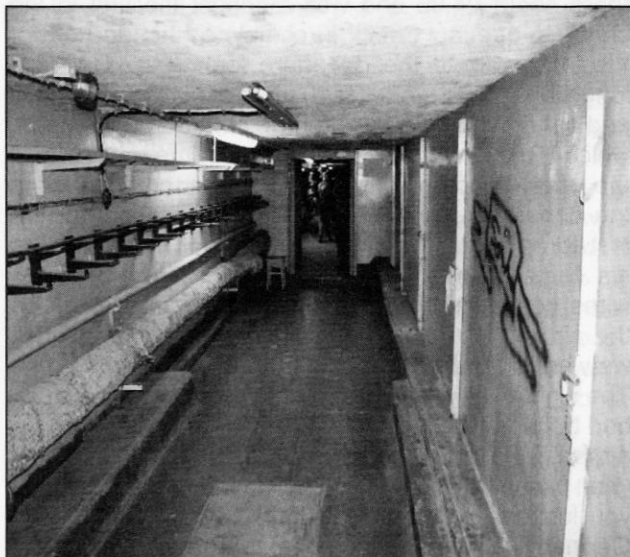


Our first underground visit was in an old vehicle bunker that had been converted into a personnel bunker. The access was through a metal hatch and down a steel ladder. This led into a big room. The posters on the wall showed the soldiers how to dress, wash and how to march. We left by a long tunnel and headed off to the Zeppelin bunker.

The Zeppelin bunker was built during WW2 and then modified by the Russians for their own use.. This is a large bunker, it has it's own lift!!!. There is lighting installed in the majority of the complex and after Herr Bochert had turned the lights on we headed off



further into the bunker. Most of the bunker was in good condition, as the pictures below show. The bottom floor was a different matter though.

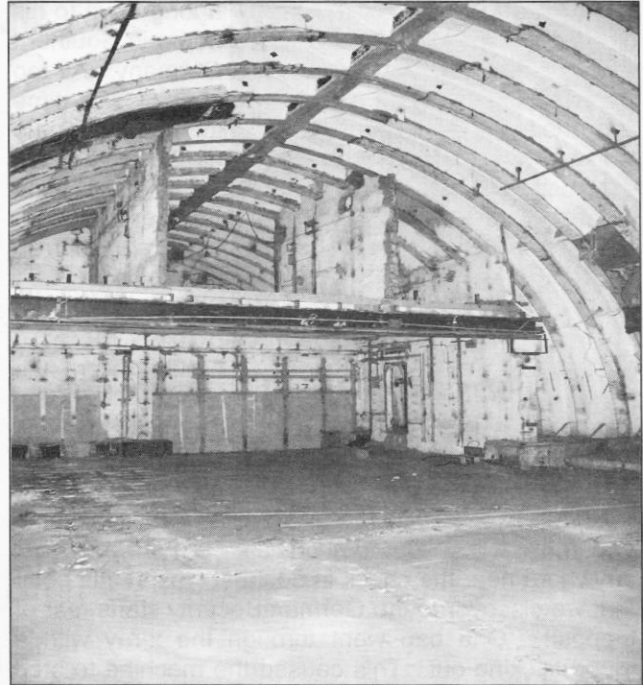


Zossen Wunsdorf-A day trip

This had suffered badly from damage caused by the Allies trying to blow the place up at the end of the war. Consequently it has got a bit damp!!



There are 2 floors but the top floor does not run the full length of the bunker. This stops at one end and was where the air defence radar screen was. When



the Russians left a lot of the kit was taken back to Russia, but a large amount of kit still remains in the bunker. One room had a soldier's jacket, complete with rank badges on. Walking round the bunker we found a poncho, loads of technical drawings for the various systems in the bunker, a telephone exchange and empty cigarette packets

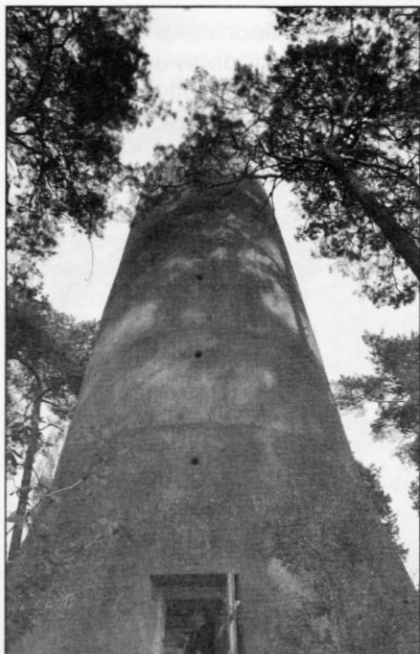
One of the other rooms on this level was the 'Graffiti Room'. This has graffiti that was written/scrawled on the wall by the Russian inhabitants. This room was replicated in UK 20 for use as a TV set as it was too difficult to get the cameras into the real room!



Our next stop was UK20. This bunker was the home of the Russian air defence for the 16th Tactical Air Army. This place is amazing. It is a pre-fabricated structure, concrete hoops are bolted together and then buried (a bit like a big Marley concrete garage!).

All too soon it was time to leave this fantastic building and head back to base for something to eat. After tea we had a quick look at a conical air raid shelter which the Germans were famous for and a look round the small museum and photo gallery. The picture shows the old telephone exchange taken out of the Comms room at the Barracks. There was much more kit like this, and an impressive map showing the whole Zossen Wunsdorf complex. Soon

Zossen Wunsdorf-A day trip



after this we said goodbye to Mike Barton, as he had a long drive to his home in Southern Germany. All too soon it was time to head for the airport to check in for our flight home.....which was interesting to say the least!

We got off the coach, and headed for the check in desks. The security was tight and all bags had to go through a x-ray machine before you got

anywhere near the check in desk. It was at this point that we discovered the German Security staffs fear of tripods!! One bag went through the x-ray with a tripod sticking out. This caused the machine to stop and much talking and pointing in German!. I assume it was the supervisor who came over and spoke to the owner of the bag and explained that the tripod had to go in the hold. "But we brought them over as hand luggage" did not impress him, so after much talking the bag was let through. So there we are waiting for the check in desks to open. After about 5 mins I became aware of the X ray machine staff looking at us and pointing. Two of them scurried off and were followed back by 2 uniformed Police types, complete with 9mm pistols!. If you ever find yourself at Schonefeld airport going back to the UK, don't open your hand luggage once you are through this first check. If you do then it's back to the x ray machine again.....as one of our party found out!!.

Check in desks finally opened, and after a second passport check it was onto the final X ray before the duty free bit. My bag went through twice, I didn't beep when scanned with the metal detector and was let through. It was at this point that things got interesting. The security people still didn't like tripods and were most insistent that they had to go in the hold. When this point was argued, some members of our group were taken into an office for a little chat!. The outcome of this was that 4 tripods had to be put into big orange jiffy bags, sealed and then handed to the cabin crew of our plane. One more passport check and we were ready to board the plane.

The flight back gave me a chance to try and sleep, which amounted to about 10 mins because the stewardess kept banging into my seat with her trolley!. After the 4 tripods had been collected, we



headed off to the arrivals lounge. Walked straight through the green channel and onto passport control. Passport control was flowing nicely until I got there. He looked at my photo, looked at me, looked at my photo again and said "where have you been sir?". In the few seconds it took me to answer "Berlin" I was thinking "I've been up for 42 hours with no sleep and all you want to now is where I've been!?!". He seemed happy with the answer and I was allowed into the UK. A short drive took me to a local Travel lodge, where there was a queue to check in. I sat down to wait and was woken up 10 mins later by the receptionist who said "would you like to check in sir, you look very tired".

My thanks to Robin Ware for organising such a fantastic trip and Mike Barton for being an excellent guide.

Note: My apologies for any inaccuracies in this trip report. I typed the original up a few weeks after we got back but when I tried to retrieve it off my laptop to send to the Editor, good old "Windows ME" had a bit of a funny five mins and deleted 2 files, one of them being my trip report!. The report above is as I remember it!!.

Pictures and Report From Dom Jackson

Annual General Meeting

16th October 2004 at 10.00am

Owen Harris Lecture Theatre, Buckinghamshire Chilterns University College, Queen Alexandra Road,
HIGH WYCOMBE, Buckinghamshire HP11 2JZ

AGENDA

1. To receive apologies for absence
2. To receive and (if approved) adopt the Minutes of the 2003 AGM (herewith / to be available at the meeting)
3. To receive, consider, and (if approved) to adopt the Annual Report for the October to December 2003, and the Accounts, Balance Sheet, and Accountant's Report for the year ended 31 December 2003 (herewith)
4. To consider and (if approved) adopt the motion 'That nominations for election be considered *en bloc*' [Should the number of valid nominations received exceed the number of vacancies to be filled, this motion will be withdrawn; in that case, or if the motion be put but not carried, names will be considered individually. The Committee's recommendations for Officers and full voting members of the Committee will be distributed at the meeting]
5. To elect the Officers and Committee for 2004/2005 [The Committee's nominations will be circulated at the meeting.] *Members wishing to nominate persons for Office or as members of the Committee should send their proposals to the Chair at least a week in advance. Those nominated should be fully paid up members, and should send written confirmation of their willingness to serve to the Chair. Nominations should be accompanied by the written support of two fully paid up members, as proposer and seconder.*
6. To consider the motion that the Committee be authorised to take steps to seek the registration of Subterranea Britannica as a Charity and its incorporation as a Company Limited by Guarantee.

Report for October to December 2003

Subterranea Britannica

Subterranea Britannica was founded in 1974 to encourage and promote the study of all aspects of underground objects spaces and structures of any period made or used by human beings. During the year 2003 the Society has pursued this aim principally by organizing conferences, by organising field excursions within Great Britain and mainland Europe, by issuing publications, and through its Email List and Website.

Report for October to December 2003

This report refers only to the last three months of 2003. This is because your Committee propose to align the Society's reporting year with its financial year, something that will be required in the event of Subterranea Britannica becoming a company limited by guarantee and a registered charity. This report is thus a very brief one. The report delivered at the 2003 Annual General Meeting was an exceptionally long one, and full-length reports will be issued for future years. More up-to-date accounts of events since the 2003 Annual General Meeting can of course be found in the pages of *Subterranea*.

Annual report and audited accounts

The Society's, accounts, balance sheets, and independent financial examiner's report are circulated with this report.

Membership

Membership at 31 December 2003 was:

- 5 Honorary Members
- 21 Exchange Members (other societies etc)
- 737 Ordinary Members

Core and Fringe activities

The Society's 'core' activities are advertised in writing to all members. As a matter of longstanding policy, members are encouraged to arrange between themselves additional field visits. A number of individual members, as in previous years, have arranged numerous such meetings. Attendance at these additional field meetings is generally restricted to Subterranea Britannica members, for insurance purposes. However, it is not practicable to advertise all such fringe activities to all members by mail: they are too numerous, often arranged at very short notice, and often restricted by site owners to very small groups. Members having Email access can readily ascertain what visits are in prospect and apply to join. Members without Email access can at any time telephone John Burgess to find out what visits are in prospect, and likewise apply to join. Places are allocated, at the discretion of the organisers, on a first come first served basis. Members should appreciate however that all 'fringe' visits are essentially private arrangements between members, not centrally

Report for October to December 2003

organised by the Committee. All members are encouraged to arrange additional visits of this kind, and to invite other members to join them.

The Subterranea Britannica discussion Email list

Members are reminded of the terms of the Email *Mailing List Charter*, with which those participating in the List should be familiar and which they are deemed, by using the List, to have accepted.

Emails are to be relevant to the Society's Objects (Constitution 2.1), and worded in a civil and considerate manner. Authors of Emails posted to the List are to avoid the use of potentially libelous or slanderous comments, and to avoid the discussion of political or sectarian questions (Constitution 2.3.11.) Private Emails are not to be re-posted to the List without the agreement of their authors.

Members who do not observe the conditions will, according to the seriousness of the transgression, be given a warning, have their Emails moderated, or suspended from participation in the List pending review in due course by the Committee.

The Subterranea Britannica Website

The Website has been widely praised both within and without the membership, and is visited by very large numbers of enquirers. Whilst it is still currently predominantly devoted to Cold War sites, steps are

now being taken to include many more sites of other kinds such as mines, tunnels, and underground quarries. Members should appreciate that many of the site visits featured have been organised by, and the reports and photographs contributed by, individual members or groups of members in their own time and at their own expense. These 'fringe' visits should not be confused with the Society's 'core' events and general membership entitlement referred to above. The Society is greatly indebted to those members who contribute reports and photographs, and who use their own time and equipment to make the Website so impressive.

Officers and Committee

The officers have been Paul Sowan (Chair), MC Black (Vice-chairman), Roger Starling (Secretary), Sue Monsell (Treasurer) and Nick Catford (Membership Secretary.)

Members of the Committee have been Linda Bartlett, John Burgess, Martin Dixon, Bruno Hewitt, Dan McKenzie, David Mapley, John Smiles, Gerald Tagg, and Robin Ware. Sylvia Beamon, Mark Bennett, and Andrew Smith have been co-opted members.

Paul W. SOWAN

CHAIRMAN on BEHALF OF THE COMMITTEE



Subterranea Britannica - Martin and Linda's French Excursion 2004, Full Report in Issue 6.

Subterranea Britannica—Summary Report 2002

From 1 January 2002 to 31 December 2003

INCOME/EXPENSE		Period ended 31 Dec 2003	Period ended 31 Dec 2002
INCOME			
	Membership Subscriptions	11,417.50	9,031.00
	Publication Reprints	29.00	18.00
	TOTAL INCOME	11,446.50	9,049.00
EXPENSES			
	Affiliation Fees	141.00	159.90
	Bank Charges	-	5.50
	Insurance	135.00	795.75
	Miscellaneous expenses	46.50	10.00
	Post, Packing & Stationery	1,569.60	508.83
	Printing	3,219.53	5,401.43
	Computer Equipment	990.21	239.44
	AV purchase	482.24	
	Depreciation - P.Sowan's PC etc	-	559.82
	TOTAL EXPENSES	6,584.08	7,680.67
SELF-FINANCING ACTIVITIES			
	Mistley trip		(40.00)
	Income from Conferences	2,282.50	2,230.50
	Outgoings from Conferences	(1,569.85)	(1,757.97)
	Income from Study Weekend	4,688.00	3,284.00
	Outgoings from Study Weekend	(3,923.93)	(3,537.49)
	TOTAL SELF-FINANCING	1,476.72	179.04
	TOTAL INCOME/EXPENSE	6,339.14	1,547.37
	BROUGHT FORWARD	9,285.88	7,738.51
	ACCUMULATED INCOME	15,625.02	9,285.88
NET ASSETS			
	OFFICE EQUIPMENT	-	-
	CASH		
	Unity Trust Bank	12,317.19	8,258.43
	GiroBank	1,994.65	1,994.65
	Cash Floats	1,014.68	369.30
	PAYMENTS IN ADVANCE		
	Insurance	-	-
	Spring Conference Deposit	502.50	
	RECEIPTS IN ADVANCE		
	Subscriptions	(204.00)	(1,336.50)
	CREDITORS		
	Printing	-	-
	Conference	-	-
	Insurance	-	-
	TOTAL	15,625.02	7,738.51

Royal Gunpowder Mills

Around forty members of Subterranea Britannica and their friends enjoyed a day at the Royal Gunpowder Mills historical site at Waltham Abbey in May 2004.

After a brief introduction and multi media presentation in the former library building, a quick perusal of the museum and a group photograph, the party set off on a walking tour of the public part of the site lead by Mr Wayne Cocroft of English Heritage and Mr. Les Tucker, a local expert and volunteer guide at the Gunpowder Mills. Mr Cocroft wrote "Dangerous Energy" (published by English

Heritage) an extensive account of the development of explosives and propellants from gunpowder, through cordite to rocketry and containing a lot of background information on, and history of, the Gunpowder Mills at Waltham Abbey; he probably knows more about the site than any other human being.

After a popular lunch in the Saltpetre House, we set off on a walking tour (between two and three miles) of



the "secret" northern part of the site that is normally out of bounds and not open to the public. We fought our way through waist high vegetation to visit many of the now derelict buildings including those built, for example, for the preparation of nitroglycerine and drying of cordite. We saw the pool used in the development of Torpex (TORpedo EXplosive) and testing of

Dr Barnes Walis' "Bouncing Bomb" and possibly the only extant example of Victorian corrugated iron.

We also tried to interpret erections used in the early days of rocketry when the site had been transformed from a factory into a (non-nuclear) research establishment.

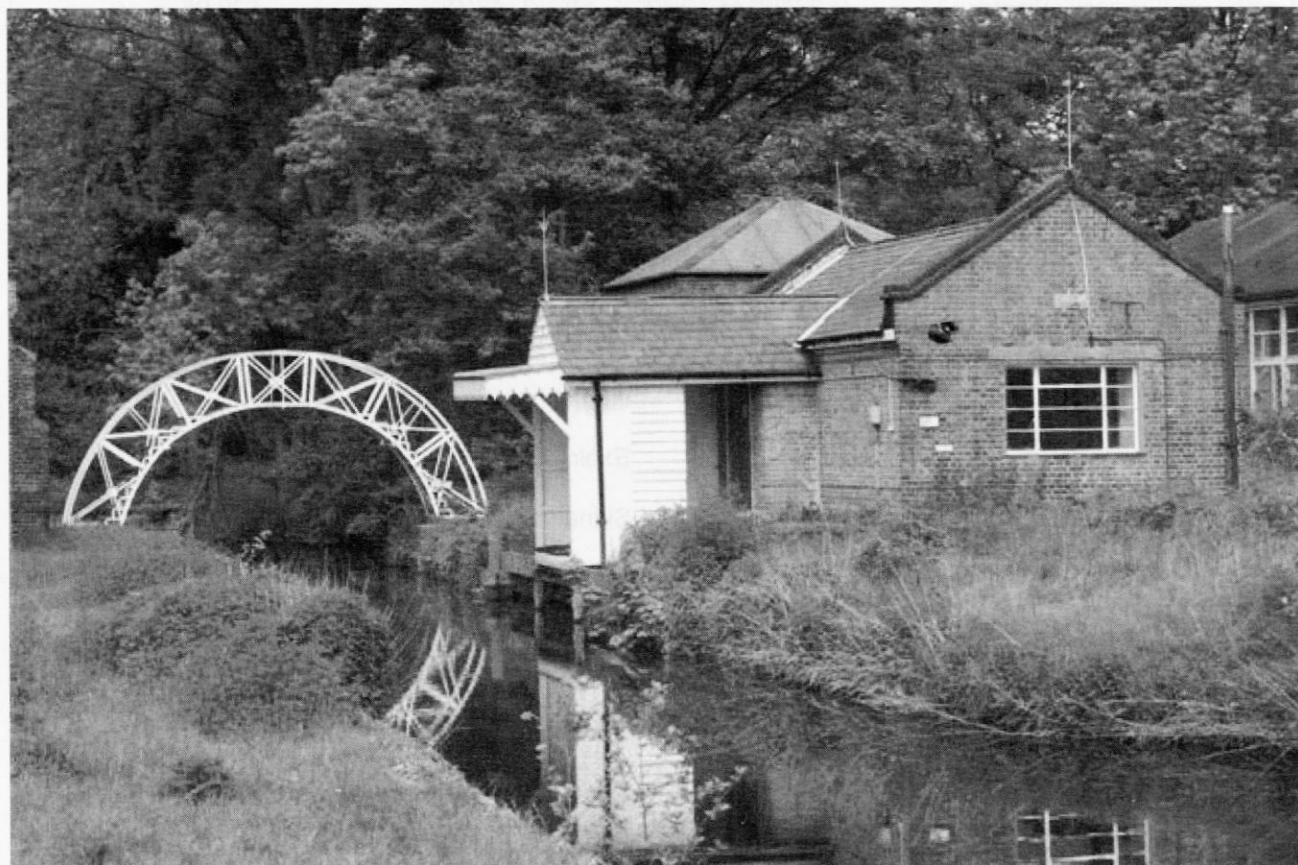
While the enthusiasts were on this safari, some families took the opportunity to watch a re enactment by the Napoleonic Association (which, sadly, the French won).

If there is sufficient interest, it is possible that the visit could be repeated.



From MC Black

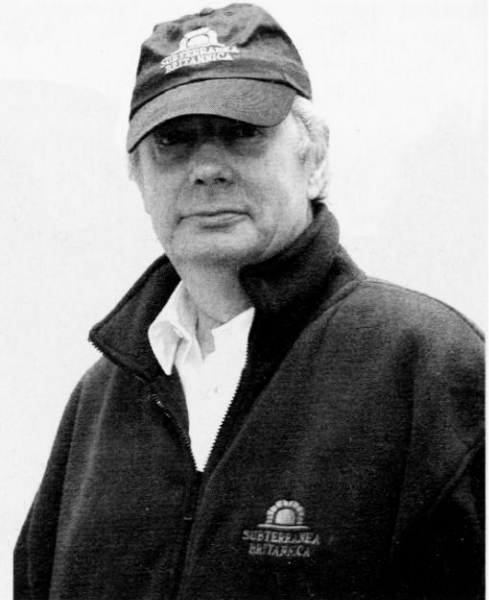
Royal Gunpowder Mills



SUBTERRANEA SHOP - PRICE LIST AND ORDER FORM



SUBTERRANEA BRITANNICA



All items are in Navy Blue with the Subterranea Britannica logo and name in light blue.

Item	Size	Price	Qty
'Fruit of the Loom' Sweatshirt	S-36" M-38" L-40 to 42" XL-44 to 46" XXL-48"	£20.95
Cotton polo shirt	S-36" M-38" L-40 to 42" XL-44 to 46" XXL-48"	£18.95
Lambs wool V neck sweater	S-36/38" M-40/42" L-44" XL-46/48"	£39.95
Baseball cap, unlined	One size fits all	£8.95
Boiler suit	S M L XL	£31.95
Full zip fleece	S M L XL XXL	£28.95
Total purchases		Value £.....

Name

Please debit my credit card: Visa/MasterCard

Address.....

Number.....

.....

Expiry date.....

.....post code.....

Signature.....

Telephone number.....

Postage and packing will be added at cost.

If you prefer to pay by Cheque, please telephone first to obtain postage and packaging cost. Other items are available on request, please telephone for a quotation.

Please photocopy and return this order form direct to;

**Rainbow Copy & Embroidery Services, Bath Road, Lympington, Hampshire SO41 3RW
Tel/Fax 01590 673 186 e-mail: sales@rainbowcopy.co.uk**

