Down to Earth *extra*

Issue 29 May 2015

From the Editor...

With the General Election due within days, I thought I would attempt one of those 'predictive' pieces. No, not a prediction of the outcome of the election, I'll leave that for the experts - this is more a prediction of where I think we'll be, geologically, at the end of the next five years. (I nearly said, after the next General Election, but that may be sooner than we think!) So here goes...

- There will be a major potash mine operating on The North York Moors, though possibly not by York Potash.
- UK deep coal mining will be but a memory, ending hundreds of years of mining tradition.
- The Weald area of SE England will be producing significant quantities of oil amid a blur about what is, or is not, fracking.
- Talking of fracking we will still be talking about it and protesting about it, with little or nothing to show by way of oil or gas.
- Painfully slow progress will be being made with tidal barrier plans amid continuing uncertainty about energy supplies.
- Metal mining will be seeing a renaissance in Britain with the SW and North Pennines leading the way.

Chris Darton
Editor/Publisher

news update

Could the Weald become the UK's 'Dallas'?

It must be rare for an oil find by a small UK company to make ***'Arab News'***, but that's exactly what happened when the small exploration company UK Oil & Gas Investments (UKOG) announced a 'very significant' discovery close to Gatwick Airport on April 9. Just how significant emerged when UKOG chief executive Stephen Sanderson, a veteran oil man, announced "Based on what we've found here, we're looking at between 50 and 100 billion barrels of oil in place in the ground".

This is all there is to see currently at Horse Hill, a sea container over a capped wellhead.

This assesment is based on the company's work in a relatively small license area at Horse Hill, in Sussex, close to Gatwick Airport. Whilst there is clearly a lot more work to be done, closer examination of the data available in the public domain indicates that there is good reason to be hopeful that this will indeed turn out to be a very significant, possibly world class, find.

For once, an industry that usually shies away from publicity, was keen to play it for what it was worth to the cameras of the BBC. Viewers were shown a field, a shipping container and even the top of the capped wellhead! The fact that this took place at the same time as a General Election could not have escaped people's minds, but for the time being the focus was on the significance of the find. The fierce battle about how and where the oil should be tapped were left for another day.

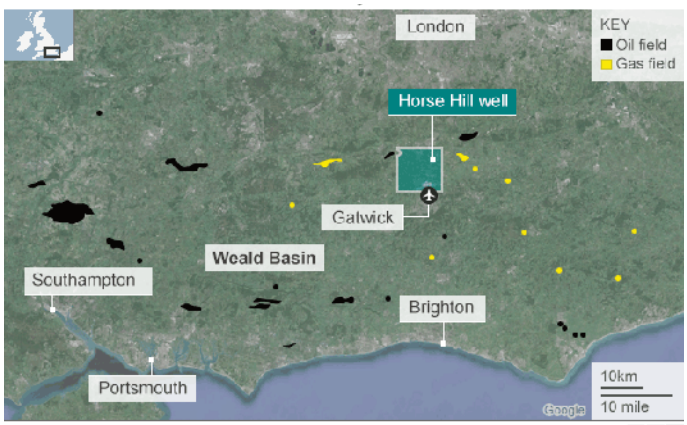
We've moved a long way from the BGS estimate of 4.4 billion barrels of just a couple of years ago to where we are now and a look at the summary report on the Horse Hill well by NUTECH shows why. The well penetrated a very thick sequence of Jurassic Kimmeridge rocks beneath a cap of Portland sandstone and limestone, totally some 575 metres, at a minimum depth of 750 metres.

Within the Kimmeridge there are three separate sequences of source and reservoir rocks composed of shales and limestones. Their work suggests that the potential oil extends eastwards, well beyond the 90 sq km under current consideration. There may also be oil source potential in the underlying Oxford Clay and the Lias and even reservoir potential in the overlying Portland rocks. This is considered to be part of ongoing studies.

For the moment, this extract from the NUTECH report makes for fascinating reading: "The Middle Kimmeridge hybrid reservoir sequence is likely the most prospective as it two thick... oil saturated limestone reservoir units. the Middle Kimmeridge units are encased within c200 m of self-sourcing, oil saturated organic rich mudstones

with TOC (total organic content) of 9.4%."

When you add in the available evidence that the Kimmeridge shows good natural fracturing, you can begin to see why there is great excitement around about this discovery. The NUTECH report compares the discovery with data from the major Bazhenov Formation of Western Siberia, a known world class petroleum system and it compares very favourably. Closer to home it ranks alongside even the largest offshore North Sea oilfield.



Source: UK Oil & Gas Investments, British Geological Survey BBC

The BGS view of the area: with oil and gas fields of the Weald indicated, and the position of the Horse Hill site clearly surrounded by other prospects.

The big unanswerable right now is what percentage of any available oil might be recovered and here the experts are divided. The optimists point to somewhere around 15%, maybe more in the longer term, whilst others point to some challenging technical issues. Some even believes that meaningful recovery will only take place if fracking techniques are employed.

For the moment, UKOG can claim the credit for drilling the deepest well in the Weald Basin for 30 years. That one well has been used to gain vast knowledge about the wider structure and its potential, using techniques that were unavailable in the 1980s when it was last looked at. Needless to say, shares in the AIM listed company have rocketed in recent days.

Research being undertaken at London's Imperial College also firmly suggests that the potential for oil in the Weald may have been seriously underestimated in the past. Professor Alastair Fraser has had samples from the Weald analysed using sophisticated equipment at The University of Utah in Salt Lake City. His independent estimate, based on a study of one third of the Weald is that there are reserves of 13 billion barrels.

Update: In further comments to the Stock Exchange, the CE of UKOG has sought to play down the "50-100 billion barrel" comment made earlier.

Meanwhile over at Markswell Wood near Chichester...

This site in the western part of the Weald Basin is another license area being assessed by UKOG. From an area of just 6.5 sq km it produced a peak flow of 100 barrels per day froma single 'nodding donkey' operation, with a 3931 barrels over a 6-month period. Relatively small amounts of oil are currently being produced from around a dozen sites spread across Hampshire, Sussex and Surrey.

Oil pumps in action at Storrington in Sussex, in June 2014 (Photo: Ian West)

Now it's the turn of Chile for a volcanic eruption...

It seems that hardly a week goes by when we don't get news of a volcanic eruption, somewhere in South America. This time it's the turn of Chile with a major eruption at Calbulco volcano, the first for 42 years. The last Chilean volcano we reported was Villarrica.

There are press reports of two blasts on Wednesday April 22, "creating a remarkable scene of smoke plumes and ash shooting more than 6 miles into the sky. Calbulco had another spectacular outburst early Thursday with lightning crackling through a dark sky turned reddish orange by the explosion."

A sense of the amazing display put on by Calbulco during its April 22/23 eruption

There are some amazing photographs on the internet - go take a look for yourself. People were evacuated from the immediate ashfall area and there are no reports of casualties. Ash fell as far away as the neighbouring country of Argentina.

Calbulco is reported to be amongst the top three most dangerous volcanoes in Chile and has an eruptive history going back until at least 1837. It erupts andesitic lava and has been very prolific on occasions in the past.

In 1893–1894, violent eruptions ejected 30-cm bombs to distances of eight kilometres from the crater, accompanied by voluminous hot lahars. Strong explosions occurred in April 1917, and a lava dome formed in the crater accompanied by hot lahars. Another short

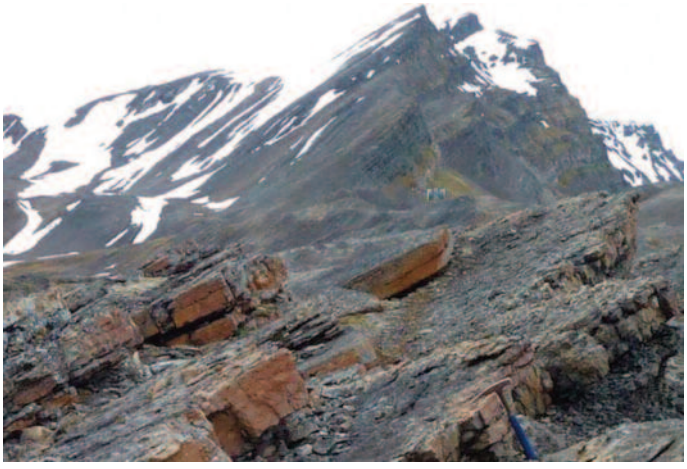
explosive eruption in January 1929 also included an apparent pyroclastic flow and a lava flow. A major eruption of Calbulco in 1961 sent ash columns 12–15 km high and produced plumes that dispersed mainly to the south east and two lava flows were also emitted.

(Source Wikipedia)

Elevating the Capitanian extinction event...

Scientists have been aware for some time that there were several distinct extinctions during the Permian and Triassic that seem to have combined to provide us with something that threatened the very existence of life on Earth.

Now a new study led by Dr David Bond of the University of Hull has identified another event that seems to fit into this complex jigsaw. The study that is presented in the ***Geological Society of America Bulletin***, identifies an event taking place at 262 million years ago. This event, known as the Capitanian, occurred during the middle of the Permian and the team claim to have gathered sufficient evidence to promote this event to become 'one of the big five' extinctions.



The Kapp Starostin Formation of Spitsbergen, which the team accessed in July for three years, 2011-13, gives up its secrets

The new evidence comes from Spitsbergen and rocks called the Kapp Starostin Formation. This formation is about 400 metres thick and the rocks span some 27 million years. But this was no fossil hunting exercise, instead the team analysed caron and strontium isotope ratios, along with measuring the abundance of a number of trace elements. They even looked for evidence of magnetic polarity variation and reversal. This work enabled the team to correlate the Spitsbergen rocks with ones found in the tropics that were used to define the Capitanian some 20 years ago.

Having established that they were looking at the same time interval, the team then went on to look at the record of fossils in the Spitsbergen rocks and were able to see that right in the middle of the Capitanian, some 87% of the brachiopods became extinct in a matter of a few ten thousands of years - clearly something dramatic had happened.

Shortly afterwards new brachiopod species, along with many new bivalves begin to appear. However, because this is the Permian, even these new species don't last long. They are themselves wiped out by the end-Permian extinction event. The group concludes that this was no regional event, but something that occurred on a global scale.

Coming face-to-face with rocks on our new day trip programme...

How well can you 'read' rocks? Do you want to improve and extend your field technique?

During 2015 we'll be hosting a programme of day trips around the country under the title ***"Coming face-to-face with rocks"***. They are suitable for those taking their first field geology steps or those who want to learn more about the 'how' of field techniques. They are open to adults and students aged 14 and over. The cost is £12.00 each for adults and £10.00 for students under 19. For details see above and our website. To book either ring us on 0114 245 5746 or go to our website ***www.geosupplies.co.uk***

May 4	**Face-to-face with rocks at Grey Mare's Tail & Dob's Linn, Moffat**
May 13	**Face-to-face with rocks at Pensitone Hill, Howarth, West Yorkshire**
May 17	**Face-to-face with rocks at the Great Rome, Llandudo**
May 20	**Face-to-face with rocks at Irchester Country Park, Northants**
June 3	**Face-to-face with rocks around the Somerset Earth Science Centre, Mendips**
June 24	**Face-to-face with rocks around the National Stone Centre, Derbyshire**
July 4	**Face-to-face with rocks on the Isle of Wight**
July 29	**Face-to-face with rocks at Albury & Shere in the Weald of Surrey (Date change)**
August 1	**Face-to-face with rocks in Dudley, West Midlands**
August 8	**Face-to-face with rocks on the Sedgwick Trail in the Yorkshire Dales**
August 19	**Face-to-face with rocks on the Yorkshire Coast**
September 26	**Face-to-face with rocks on the Lleyn Peninsular of Wales**
October 24	**Face-to-face with rocks in North Somerset**

learning zone

Late Vacancies
Residential field trips 2015

We can still accommodate a few people in twin/double rooms on the following 2015 field trips.

Isle of Wight July 1-8
Lleyn Peninsular September 25-29
Minehead, Somerset October 21-25

Brochures for these and all other trips, are available on our website www.geosupplies.co.uk To obtain a booking form, simply email us: downtoearth@geosupplies.co.uk

Residential field trips 2015

We now have brochures available for all of the 2016 trips, with the exception of Arran. Bookings are already coming in, with nearly 30 places confirmed. See the next page of this DtoE extra for details.

Upcoming Day Field Trips

Monday, May 4 Grey Mare's Tail & Dobs Linn, Moffat
Come and join us at one of the most iconic geological sites in the UK. Dobs Linn is where Charles Lapworth studied graptolite zones across the Ordovician/Silurian boundary. Grey Mare's Tail is Scotland's highest waterfall, set in the glaciated valley of Moffat Water. This is another trip postponed due to bad weather on the original date.
Meeting: Grey Mare's tail car park at 10.30

Wednesday, May 13 Geology of Penistone Hill, Howarth, West Yorkshire
Come and join us on a gentle geowalk around several sites on Penistone Hill, close to the Worth Valley village of Howarth (of Bronte fame). On this walk you'll be able to examine a variety of different rocks from the Upper Carboniferous in both buildings and old quarries. We also take in the landscape and how this has been carved, particularly in glacial times.
Meeting: Dimples Quarry, Dimples Lane, Howarth at 11.00 (parking available in quarry GR SE 0256 3701)

Sunday, May 17 The geology of the Great Orme, Llandudno
This is one of the finest outcrops of Carboniferous limestone in the UK offering spectacular cliff scenery and views over Snowdonia. Come and explore the fine geology with us.
Meeting: Visitor's Centre, Bishop's Quarry Road at 10.30

Wednesday, May 20 A geowalk in Irchester Country Park
Irchester Country Park is close to the Northamptonshire town of Wellingborough and is set in Jurassic Ironstones. Thanks to the hard work of local volunteers rocks are now visible once again in a very long quarry face. See the ironstone and collect the fossils!
Meeting: In the lower car park at 10.30 (fee payable)

Wednesday, June 24 Face-to-face with rocks in the Peak District
Another in our series of introductory field trips designed to help you get more out of your field geology. On this day you'll be seeing limestone and Millstone Grit, mineral veins, faults and a former reef complex. All this in pleasant countryside, complete with two cafes!
Meeting: National Stone Centre, nr. Wirksworth at 11.00

Saturday, July 4 Face-to-face with rocks on the Isle of Wight
Join us as we take a look at the vertically sediments that make up the multi-coloured rocks of Alum Bay and the dramatic chalk cliffs.
Meeting: Alum Bay, Needles Park at 11.00

N.B. Changed Date
Wednesday, July 29 Face-to-face with rocks in Surrey
Come for a geowalk in the Weald as we learn the relationship between rocks and the landscape in sunny Surrey.See the variable rocks of the Cretaceous and the landscape that they create.
Meeting: Newlands Corner car park, 3 miles E of Guildford at 11.00

N.B.Changed Date
Saturday, August 1 Face-to-face with rocks at The Wren's Nest, Dudley, West Midlands
Another opportunity to visit the first geological National Nature Reserve in England and try to work out the geological structure from field evidence. There should also be time to look for some of the fossils that make the Wren's Nest famous.
Meeting: Playing fields car park, Priory Road, Dudley at 11.00

Saturday, August 8 Face-to-face with rocks on the Sedgwick Trail, Yorkshire Dales
This is a superb place to experience landscape and rocks at their very best. This is where the Yorkshire Dales meets the Howgill Hills at a major fault that changes the landscape. You will learn the techniques necessary to understand how to 'read' rocks and the landscape.
Meeting: Parking area on A684 Sedbergh to Hawes road at (SD 695913) at 11.00

Wednesday, August 19 Face-to-face with rocks at Cayton Bay on the Yorkshire Coast
Come and explore something of the Yorkshire coast with us on this summer day. We'll be examining the coast from the clifftop path and also down on the beach. We take in the fossiliferous Jurassic rocks, along with the rich variety of pebbles to be found on the beach. There's something for everybody on this day of contrasts.
Meeting: Cayton Bay car park (fee payable) at 11.00

Day trips cost £12.00, students under-19 £10.00 or buy a 2015 Privilege Card that covers 6-days for £50.00. Further information and bookings *downtoearth@geosupplies.co.uk* or telephone: 0114 245 5746. ***Advance booking is essential.***

Advance booking is essential, but may be done the day before. If you do not get through on the office number try Chris Darton mobile: 07887 565295.

2016 Field Trips - the decisions have now been made & the bookings are rolling in!

Long Quarry Point (Photo: English Riviera Global Geopark)

Thanks to those of you who responded to our call in the last two issues for help with our 2016 field trip programme.

We've ensured that we are offering the most popular trips but have had to make some difficult choices. If you didn't get your favourite, we are sorry, but there's always another year.

The dates and venues, as shown opposite, are now confirmed. Brochures for all the 2016 trips (except Arran) are now available and we are 'open' for bookings - indeed a number of you already have!

For those of you requiring single rooms, it's especially important to get your booking in early - as these rooms are often limited.

Email Chris Darmon at:
downtoearth@geosupplies.co.uk

The 2016 'definites'...

- **Madeira - February 22-29**
- **Berwick & the Borders - April 3-8**
- **Isles of Raasay & Skye - April 16-23**
- **Isle of Arran - May 14-21**
- **Heart of Wales - June 4-11**
- **The Shetland Isles - September 3-11**
- **The Lake District - Sept. 30-Oct. 5**
- **South Devon Geopark - October 15-22**

and...
- **Gran Canaria - February 2017**

Brochures for all 2016 trips are posted on our : www.geosupplies.co.uk

For a booking form email: downtoearth@geosupplies.co.uk

Final call to join our distance learning course "Field Technique in Geology"...

In conjunction with our "Face-to-face" with rocks field trips we are once again running our popular "Field Techniques in geology" distance learning course, commencing in May and ending in A August. This is the perfect time of year to combine the theory with the practical.

Field techniques in geology
11-weeks commencing May20
Learn how to 'ready the rocks' with our course and come on field trips to put the theory into practice! This course has been used by many students over the past three years. The cost includes a FREE day trip of your choice from our 2015 list.
Cost: £80.00 email/Moodle £95.00 post

We are enrolling NOW for this course, you can do so via our website www.geosupplies.co.uk or you can ring us on 0114 245 5746 or email downtoearth@geosupplies.co.uk

GEO in store

New Geo-field workstation by Laserware makes it cheaper to work in the field in all weathers...

For many years we have sold the all British made Weatherwriter range of outdoor workstations. This excellent product never sold in the large numbers we hoped for, due to the relatively high cost, around £40.00 of the A4 version.

Now a company called Laserware, who are more well known for their outdoor electronic instruments have launched what they call a weatherproof clipboard. It does essentially the same job as the Weatherwriter and because it is now being mass produced in China, cost considerably less.

As a result, it's being sold at a much lower price, typically little more than half of the previous cost for the British made product. Whilst this is sad, it was always something that was going to happen. sooner or later.

We at Geo Supplies are selling it under the title ***"Geo-field workstation by Laserware"*** since we think that this describes what the Earth scientist is looking for in a field product. We look forward to this product now selling in considerably higher numbers. Now you really can afford to work in all weathers!

Most sellers are pitching the A4 portrait format (the most popular type) at £22.95 or £22.99, but our price is £21.95 including postage in the UK.

Be amongst the first to use this excellent product by purchasing one online at our website: www.geosupplies.co.uk

or by phoning us on 0114 245 5746

new from BGS...

William Smith bi-centenary, now there's a modern map of the UK in his honour...

2015 is the bi-centenary of the publication of William Smith's 1815 map of England & Wales. BGS has already made available folded copies of the facsimile map, in addition to the flat copies, and even a facsimile of the memoir that originally went with the 1815 map.

Now there's a modern map of the British Isles, complete with some excellent cross sections in the style of William Smith - as a tribute to the great man.

This new map is £12.95, post free in the UK.

The William Smith bundle - order this map, the 1815 facsimile map and the memoir we'll do you all three for £35.00 post free in the UK.

Order online at:-
www.geosupplies.co.uk or by ringing us on 0114 245 5746

Down to Earth extra is published & designed by Geo Supplies Ltd., 49 Station Road, Chapeltown, Sheffield S35 2XE

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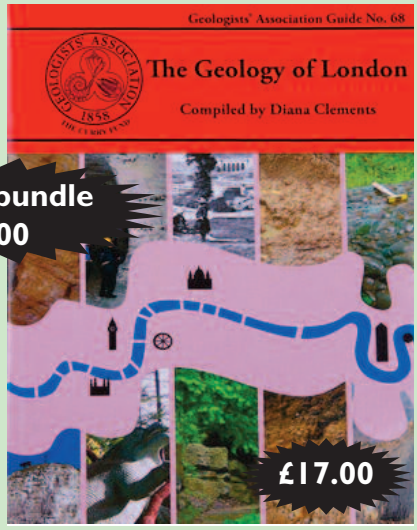
Featured books May - July 2015

In each issue we are pleased to be able to introduce you to a range of featured books. Where they are being offered at reduced prices, these will be current to the end of the month shown above, provided that stocks are available. All prices include UK postage.

Grab these offers before they disappear...

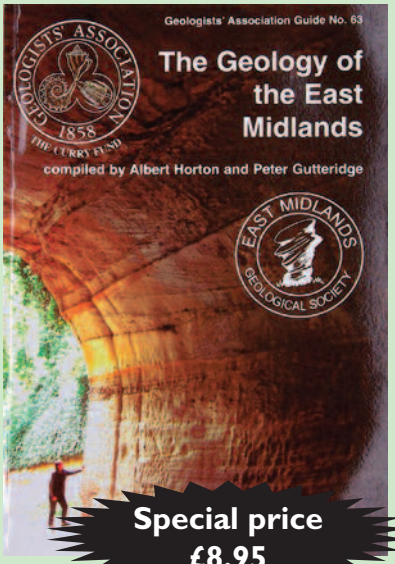
Westminster
The Tower
Greenwich
Trafalgar Square
St. Pauls

Holiday Geology 5-pack £9.75

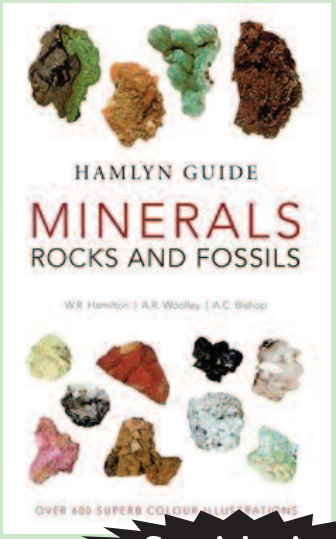


London bundle £25.00

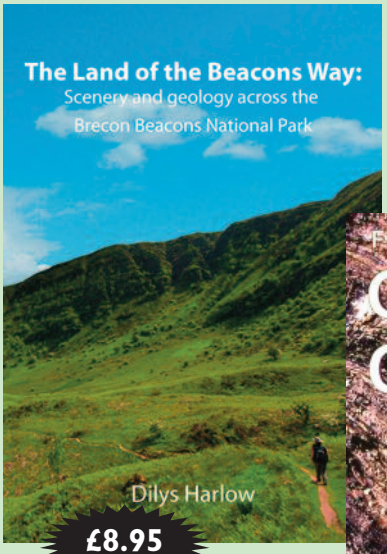
£17.00



Special price £8.95



Special price £4.99



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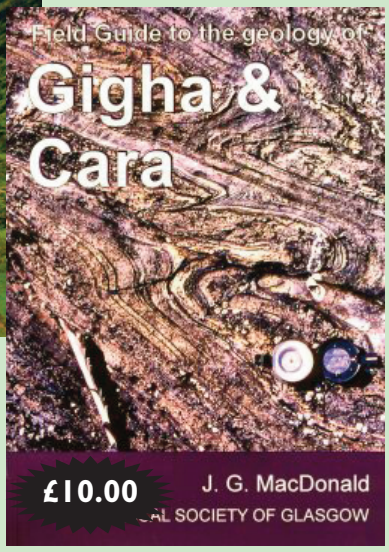

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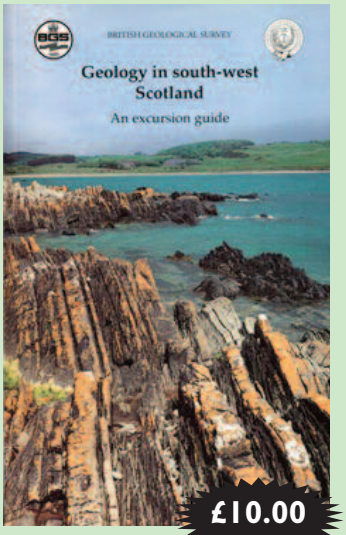

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