



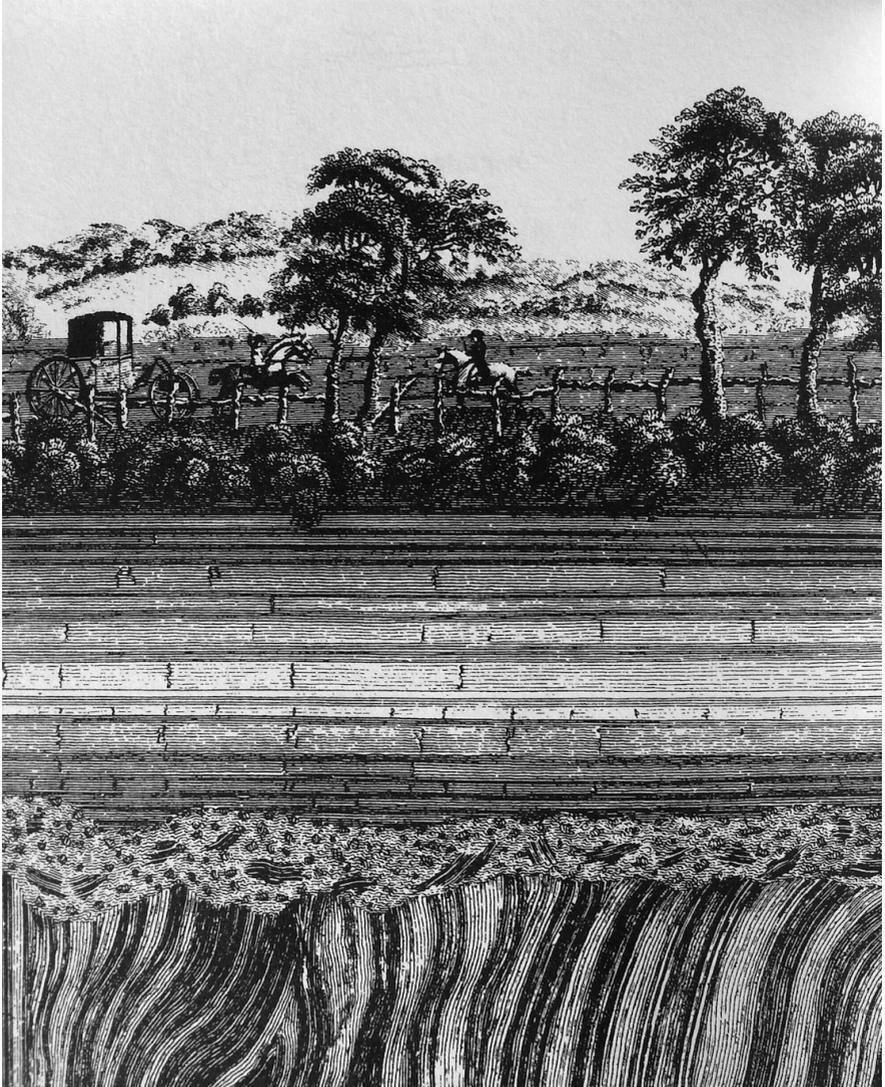
**A DIALOGUE ON MARGINAL GEOLOGY**



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This dialogue was developed during Home Workspace Program 2013-14,  
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Maeve Brennan &  
Miguel Fernández de Castro



*The Jedburgh unconformity.*

*Miguel Fernández de Castro:* Time ago I read in a diary of a geologist that cuts in mountains to build roads represent for him a wonderful event, because those roadcuts expose a lot of strata information ('We as geologists, are fortunate to live in a period of great road building'). In a sense, a roadcut is a gateway to millions of years of sediment. These cuts are obviously an imposture, because they are mainly made with dynamite. These unnatural and violent blasts make it possible to study the history of the sediments in a relatively small space and time: an explosion lasts just some seconds but exposes, in one gesture, millions of years. They are, in a sense, information facilitators. Recently, I've been thinking about this kind of event in which an abrupt eruption of an element reveals a large amount of information that otherwise would remain hidden forever. In geology, time is manifested in thick layers of minerals. If, suddenly, these sediments become exposed, we are facing a lot of information and, of course, a lot of time. It is, then, a blast that reveals time. But, obviously, the blast is not enough to understand data. How do you understand the issue of time in geology in relation with the notion of exposure?

*Maeve Brennan:* This brings to mind my recent visit to the limestone quarries proliferating across the West Bank. A strange but disturbingly common experience occurred – driving towards a mountain only to find that it stops half way in an abrupt vertical line. As the physical landscape itself disappears, the insides of mountains become exposed and, in a region where the disciplines of archaeology and history are particularly politicised, these cuts into mountains become even more pertinent. Such geological formations are a way of perceiving physicalised time and here, in a sense, history is made visible.

I find it difficult to come to terms with the temporality of an explosion. Perhaps it is this disparity between its existence and its impact. In quarries and indeed in the production of such roads, the use of a controlled explosion is implemented. However, in Palestine this is not the case. Dynamite is not permitted in the Occupied Territories and so instead the quarries are forced to use mechanical methods of extraction at great cost, both economically and in terms of time.



*Seven different levels of ponding are indicated by the erosion on the pile of Mount St. Helens debris. Geologist for scale. Washington. 1980.*

*MFC:* I think that the relationship between the processes of geological research and economic speculation are closely linked. Their relationship is based on a perverse necessity. Certainly, applied geological explorations are necessary to know, for example, the conditions of construction and developing models of risk and prevention of disasters. But at the same time, these explorations generate a dynamic of speculation and exploitation that is difficult to avoid. I find interesting the ideological context in which a new geological research is presented.

And it is interesting because sometimes these areas of non-renewable resources, like hydrocarbon or mineral deposits, are directly linked to tectonic fault lines that cross certain regions. Indeed, these discoveries contain an inevitable contradiction: they help to analyse and reduce risk situations for entire communities and, at the same time, they open a space for speculation and exploitation that, eventually, will affect those communities. Geological time is not here, as it is usually thought, something elusive and overwhelming. It can easily be a violent example of what capitalist speculation can generate and of the ideological context in which scientific research is developed. Geological time is extremely political.

*MB:* There is something paradoxical about geological research and its unavoidable political manipulation. Of course geologists are tied to sites of enormous political impact, dealing as they are with natural resources. However, processes of geological research rely on expert readings of hidden land formations and movements, that can in turn lead to moments of 'discovery'.



*Jerusalem Stone Quarry, Juma'een, West Bank, 2013*

Discovery, as a sensation, seems somehow outside of or beyond the political context that geology finds itself in. Perhaps this relates back to your idea about road-building – a moment of revelation when what was once hidden becomes available – be it through physically shifting the terrain or through in-depth theoretical readings of a site.

I once met a geologist who discovered a ‘giant’ oil field in Dorset, England, one of the largest geological discoveries in Europe at that time. He wrote a paper that documents the arduous investigations he undertook, insisting upon drilling a well that BP had deemed ‘water-bearing’. The well was drilled and ‘oil flowed to the surface’. Soon after this major discovery, Thatcher came to power and privatised the site, handing control over to BP and the geologist never received any credit for his work.

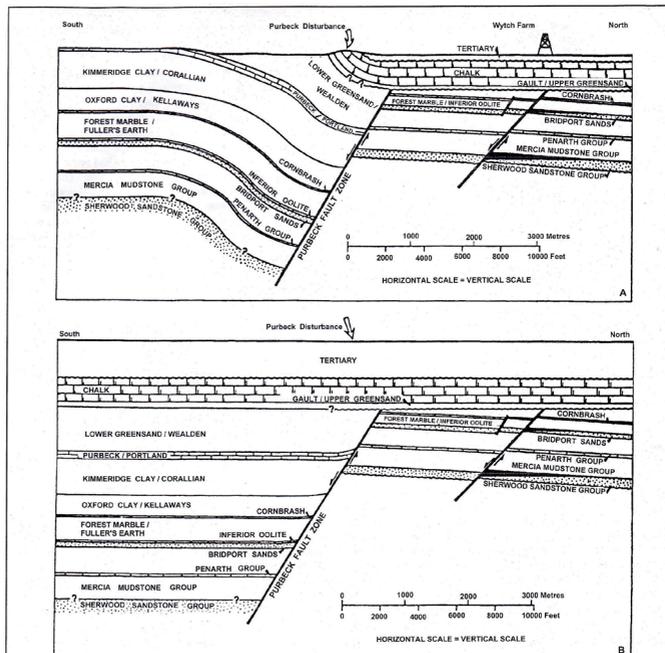


Figure 3. Interpreted structural sections through Wytham Farm Field and Purbeck Disturbance.  
 A) Present day; B) Tertiary, before Alpine Earth Movements (Colter & Havard 1981 fig 3).

*This was the clue to the discovery of the deeper, much larger accumulation*

*MFC:* Yes, first of all geological research is a job, a work exerted. And, like any job, it can be exploited. For me it is interesting that process, the transition from research to the economic and political circuit. Geologists invest resources (which in turn usually come from state or private investment) that will lead to the production of geological knowledge and possibly the discovery of a mineral deposit. But the structure is not designed to benefit the researcher, because he or she works more like pawn than a leader. If someone invested in their education and research, they would want that investment back. This has happened throughout the development of capitalism in any area of knowledge, including the art system. Of course, there are situations of dissent and disagreement (Would a geology of resistance be possible?); but it often seems that the system has it already referred. The logistics of the operation of knowledge can be fed precisely by the difference.

In 2011, in Sonora, Mexico, a producer company of natural gas fought against the refusal of the local people to install a pipeline, since its installation would have a major environmental impact on the region. Given this, the company established a series of 'ecological' measures to improve its image: the installation of a 'park of knowledge', where the importance of natural gas and friendly relationships with the environment were explained. They also published extensive research with numerous hard scientific data and floating numbers, which Badiou calls the blind number, symptom of the collapse of a language as it seeks easy and corrupted speech. The case of Lebanon is interesting. Several studies indicate that the success of the Lebanese minerals industry depends upon the long-term restoration of peace and stability to the country. But, at the same time these studies recognize the benefit of the war: rising cement demand in Syria may provide opportunities for exports. Discrepancies, conflicts and legal holes are not obstacles to the logic of capital, but parameters from which the efficiency is produced.



*Excavation site. Batroun, Lebanon, 2014.*

MB: Vic Colter attempted some form of political action during the privatisation of Wytch Farm (the 'giant oil field'). In his paper, he states that:

*In 1981 the union NALGO decided they were going to call a one-day strike because the Tory government was threatening to privatise the gas showrooms ... we went on strike for the first and only time in our lives, and a couple of weeks later I was called before the new general manager, fresh from Southern Gas in Southampton. I was standing on the mat like a defaulter before the CO, and he said that he was very disappointed by my behaviour, 'This is not expected from the Management Team.' So I explained that I was not striking for personal gain but to defend the sacred gas showrooms of the industry for which I worked, which I had only visited twice in my life. This cut little ice. The gas showrooms did not get privatised, which showed how effective our strike was, but Wytch Farm did, and I think if we had gone on strike for Wytch Farm it might not have been privatised either.*



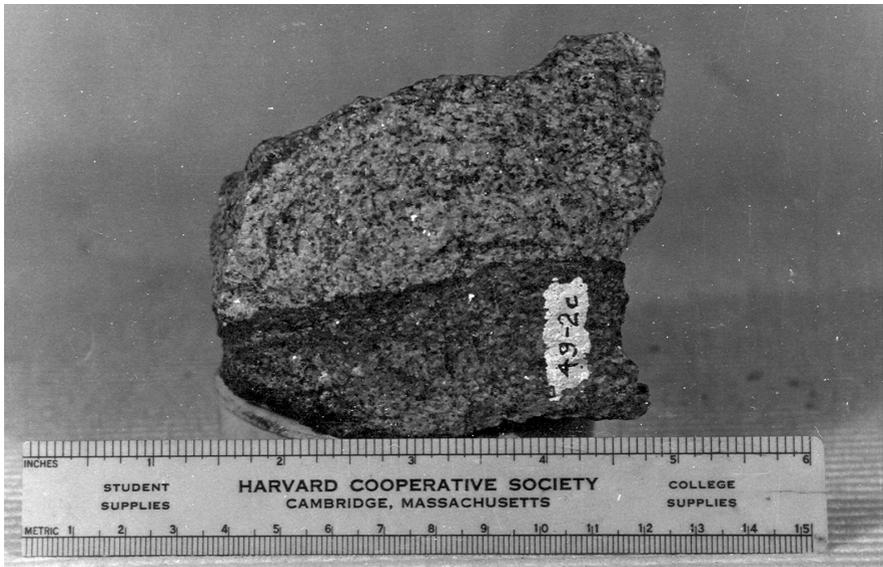
*Vic Colter holding sample of oil from Wytch Farm, Dorset, 2012*

Maybe this is not a geology of resistance but at least an example of a resistant geologist. Colter was quite clearly the victim of neoliberal policies beyond his control and yes, of course any discipline is subject to the whims of capitalism. However, there is something specific to the discipline of geology. Perhaps it is its relationship to deep time, a sort of pre-destined formation that companies may attempt to seek out but cannot readily manipulate. Geology is elusive, beneath the surface, invisible. At the same time, it is inconceivably huge, physical and material. The invisible nature of geology is what allows for Badiou's blind number but it is also what gives geologists a certain cachet – their ability to determine how the earth looks on the inside.

Colter once described to me his time spent in Cuba in the 1950s. The Cuban Revolution was beginning to take hold as Colter did field work in the vain hope of finding oil. I asked him how it had been, to which he replied: 'It was a disastrous search, we hadn't realised that Cuba had moved, pushing up against the Bahama Plate and flipping upside down. The oil was in an entirely different location discovered years later.' I was struck by his ability to see the world in terms of rocks, through a framework of time so irreconcilable with the pace of real-world events and politics.

*MFC:* Yes, the nature of Geology is, at the same time, both invisible and strongly material. Geologists often use a term that I find interesting for its allegorical potential: The Picture. It is common to say, for example, 'you do not get The Picture'. And it's interesting because %99 of The Picture is lost. Rocks and mineral compositions are pieces of The Picture. The movement of tectonic plates and the crest of a ridge are pieces of The Picture. The deposition of strata is also part of The Picture. The Picture is missing and we can only see small and fragile fragments. When The Picture is also considered through time, it is called the Big Picture, the multidimensional Picture. Both are elusive.

The lines in the rock formations represent structures – folds, faults – that stratigraphy does interpret and infer, for example, how and when certain strata were folded. The rocks are clues for creating stories that articulate the Big Picture. This articulation aims at joining the story of a stone with the story of another stone to create a big structure by connecting a larger time and space with the interpretation of patterns. But it is often like walking blind: a million years of rock formation are inferred through the study of small portions of strata. The Big Picture is always escaping and is in that movement where the sense of its search resides. Maybe we can find a geology of resistance in the use of language. Not only in the study of geological terminology, but in its allegorical potential. While the faults and deposits are events that the capitalist machine has objectified as industrialization and exploitation of resources, geological events that converge on stratification as folding and erosion



*Iron-staining of Potter Hill Granite Gneiss controlled by foliation, joints, and by no regular surface. August, 1963.*

refer more to a powerful instability which can escape the mere instrumentalization of language. The power of language resides in its allegorical potential, and the allegory is a way of thinking the difference.

A note about erosion: one of the most efficient (and dangerous) erosion processes is the hydric erosion. It is a very slow and imperceptible process where the rock surface is worn down to produce a long-term change. And it is efficient and dangerous precisely for the following reasons that appear at the same time: it wears down the surface that is in front of us so slowly that it becomes imperceptible to our eyes. The hydric erosion doesn't need to work underground to hide itself.

*MB:* It is interesting that you mention this term – The Picture. In fact, when Colter was attempting to explain his discovery to me, he went and fetched a Core Sample from a bookshelf lined with rocks. He pointed at a shift in the rock formation visible on the cylindrical stone that illustrated the land formation where he had found the oil at Wytch Farm. Core Samples are taken for interpretation – they are physical manifestations of The Picture and provide clues toward The Big Picture. It is a miniaturisation of movements on an enormous scale, both physically and temporally. I remember Colter saying that the rock was 2000 million years old and finding it completely inconceivable that I could hold this amount of time in my hands. I still find this object magical in its ability to open up an invisible world.

Your reference to a powerful instability that might escape instrumentalisation brought something that Slavoj Žižek said to mind. 'Nature is one big catastrophe. Oil, our main source of energy – can you even imagine what kind of unthinkable ecological catastrophe must have happened on earth in order that we have these reserves of oil?' Yes the resource itself has been absorbed into the forces of capitalism but its mode of production remains outside our grasp.

The various elements – heat, pressure, built-up matter, time – that it takes to generate oil belong to a different temporality and scale to the sort we exist within. I feel forced into a position of self-reflexivity when confronted by geological concepts – not a feeling of insignificance but an awareness of a bigger picture.

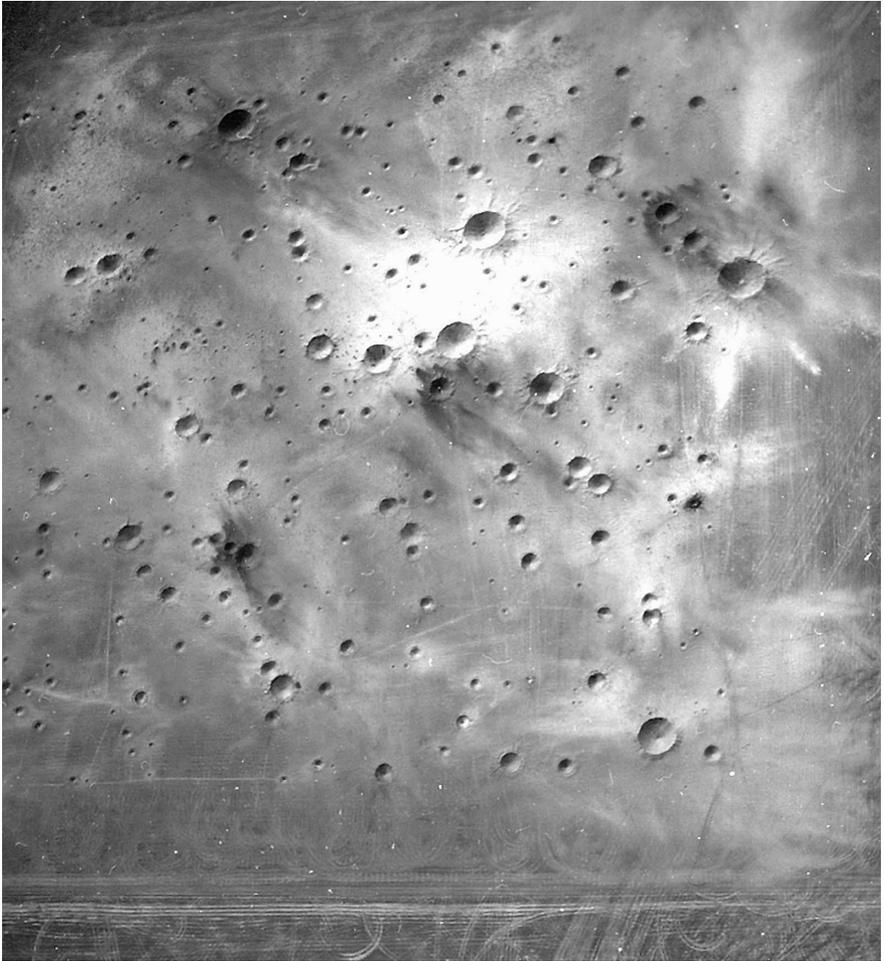
NB: Sometimes man attempts to produce objects that belong to this other-worldly scale. On a visit to Ba'albek, I stopped off to look at 'the largest stone in the world', still sitting in the quarry where it was extracted.



*Core sample used by Vic Colter to illustrate his discovery of the Wytch Farm oilfield, 2012.*

*MFC:* For me it is interesting that all the wonderful speech about the elusive condition of geological time becomes tremendously tangible when we speak about the Anthropocene. If human activity is changing terrestrial ecosystems to modify sediments, then this is an unprecedented event in geological history. Perhaps that event began with the industrial revolution and had its confirmation in 1947, when the human population exceeded the number that guaranteed access to resources. However, even that distance of about a century is very small in relation to the time of geological eras which have been classified in millions of years. And here, in assuming the Anthropocene as geological era, we are just assuming that its development is the same as that of capitalism and nothing else. Finally, capitalism altered the sediments of the earth.

*Beirut, Lebanon. June 2014.*



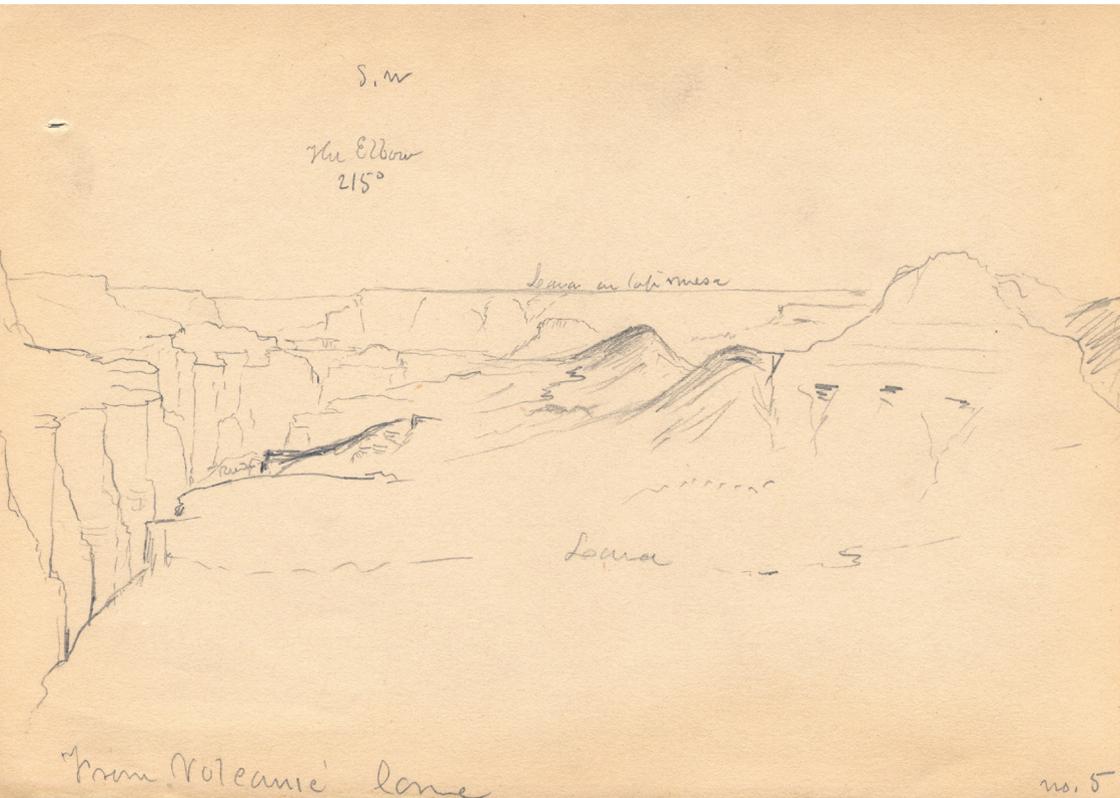
*Post-explosions aerial view of the completed Cinder Lake Crater to establish the relationship between amount of ammonium nitrate and dynamite vs. crater size. 1968.*



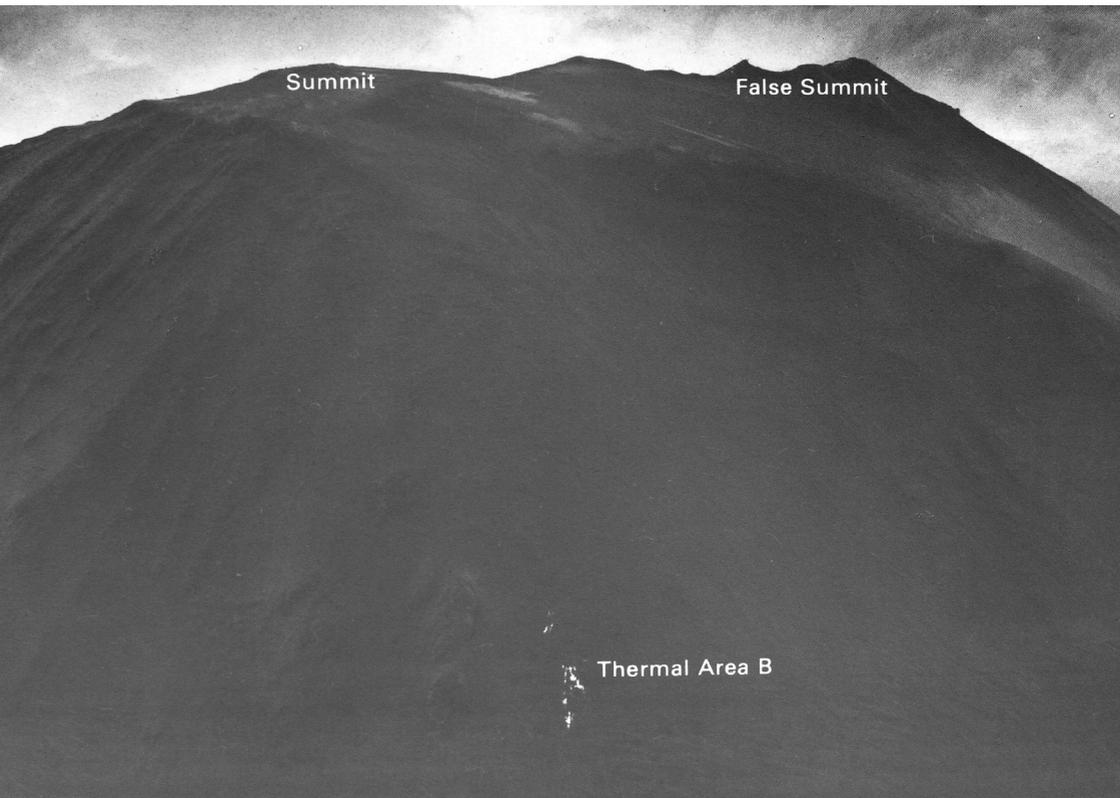
This is an example of the natural cliff fires that occur on the Dorset coast 3 or more times a century. Made from oil shale, the cliffs burn at a temperature of approximately 500 degrees celcius, producing gas and sulphurous fumes (an example of pyrolysis). When the shale is partially burnt it becomes yellow and when fully burnt it is red. These cliffs are located less that 8 miles from the oil field, discovered by Vic Colter.



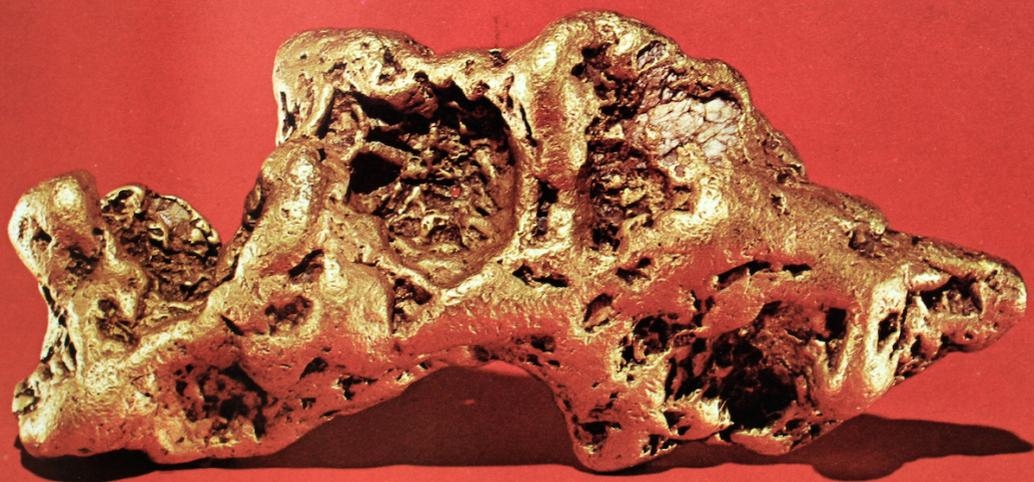
This Roman monolith is considered to be one of the largest worked stones on earth. It weighs approximately 1000 tonnes and still sits in the ancient quarry where it was cut almost 2000 years ago. It is still unknown how a stone of this scale was cut with such precision and how the Roman engineers intended to transport it. The stone lies 900m from the ruins of Ba'albek, Lebanon.



EXPLORATION: U.S. Geographical Surveys West of the One Hundredth Meridian (Wheeler Survey) Colorado Canyon Etc. No. 5. View southwest. From volcanic cone. Lava on top mesa. Locale noted: The Elbow. On back: "General outlines only are given in the sketches from the volcanic cone, at foot of Valley, as the SKETCHgrapher took views at this point. Volcanic action confined to the west side of valley, and extends across the Colorado, as well as the break in the stratas at this point. Break(?) [sic] = 1000 [crossed out] 600 feet at least." Arizona, 1872.



A false summit is a peak that appears to be the pinnacle of the mountain but upon reaching, it turns out the summit is higher. False peaks can have significant effects on climber>s psychological state by inducing feelings of dashed hopes or even failure. Oblique aerial photograph of summit area. Mount St. Helens, March 28, 1980. Distance from false summit to summit about 600 m.



Maeve Brennan (b. 1990, London, UK) is an artist based in Beirut and London. Her practice is research-based, concerned with a material understanding of politics and history. She recently completed a residency at A.M Qattan Foundation in Ramallah, Palestine, where she was researching the Jerusalem Stone industry.

Miguel Fernández de Castro (b. 1986, Sonora, MX) works on long term discursive research projects that involve writing and visual arts. In 2013 he started the ongoing project *Marginal Atlas of Geology*, which develops an allegorical relationship between geological phenomena and derived processes of late capitalism.

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