FRANCE

Salsigne: A Century of Mining, 10,000 Years of Pollution?

25 JANUARY 2015

The French town of Salsigne, in the Aude department, was home to France's main goldmine and the largest arsenic mine in the world. A century of intensive mining has radically altered the landscape and affected the health of workers and locals. Despite environmental remediation carried out by the State, pollution is still widespread today, and will remain so for several thousand years. And it's not over: a new wave of industrialists are being drawn to what wealth remains underground.

This story was originally published in French.

A few kilometers north of Carcassonne, in the Aude, lies an almost idyllic landscape: plunging hills, Cathar castles, woods, vineyards and a river that flows through the valley. At first glance, one doesn't notice the old headframe once used to transport miners into the galleries. And one is even less aware that the immense surrounding hills are actually artificial. Nor do we imagine that hidden beneath the shrubs that cover them are thousands of tons of mine tailings containing arsenic particles and other chemicals.

Salsigne's past is lurking beneath the ground, under its hills, along the winding river valley. The region has, for a long time, been a gigantic playground for mining companies, which extracted gold, arsenic and lead. It was the first goldmine in Western Europe and the last surviving goldmine in France. It was another world. All that remains of the mine, which closed in 2004, is one or two chimneys, gaping holes, a collective memory . . . and a cemetery of harmful waste.

Gold and . . . arsenic

A century of mining doesn't just end with a click of one's fingers. The pollution is everywhere: in the earth, in the air and in the water, and is due to chemicals used to process the ore and arsenic, present in the form of very fine dust found in the earth. This dust is swept up by streams that flow into the Orbiel, a tributary of the Aude River, which in turn flows into the Mediterranean.

Where does arsenic come from? It is naturally present in the region along with other minerals including gold. But due to the extraction and crushing of thousands of tons of the mountain's rocks, arsenic has spread throughout the valley. This is called the "coffee effect". *"In its natural form, arsenic is confined within large blocks of stone, so its impact on the environment is low,"* explains François Espuche, Chairman of the environmental protection organization Gratte-Papiers. *"But by crushing it into a fine dust, the amount that comes into contact with water is multiplied."* Through streams and rivers, arsenic is flowing throughout the valley, reaching potentially dangerous levels. The danger is not

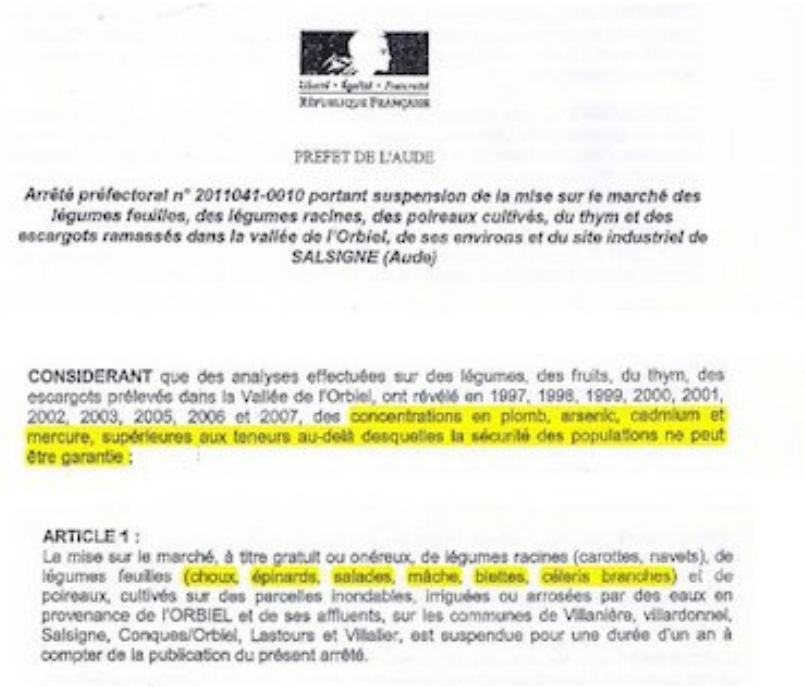
always visible, but sometimes the pollution is obvious, as when the stream water turns a strange color, as it did in January 2013. *"For 300-500 meters, the water was orange,"* recalls François Espuche.

Upstream is the Montredon storage site where 600,000 tons of waste, including 90,000 of arsenic, are stored. Local groups called in the media and contacted the police, who then called Onema, the French Agency for Water and Aquatic Environments. Samples were taken. The Prefect of Aude, Eric Freysselinard, former chief of staff to Interior Minister Nicolas Sarkozy, was quick to allay concerns to the local media: *"This is a natural oxidation process which has nothing to do with Salsigne."* The results of tests carried out by BRGM (Bureau de Recherches Géologiques et Minières), the public geological survey agency entrusted by the French State to "restore" the mine, indicated there was 30-45 micrograms of arsenic per liter of water. Although this was above the 10 microgram standard for drinking water, there was apparently no need to panic. However, over the following weeks, the results of two other tests are published – one in the newspaper *Le Midi Libre*, which talked of 1526 micrograms of arsenic per liter of water. And the other was a further embarrassment for Onema, with a result of 4469 micrograms, i.e., 450 times more than the WHO drinking water standard! *"We are dealing with very toxic levels,"* said toxicologist André Picot in the newspaper *Canard Enchaîné*. Eric Freysselinard has been transferred to Strasbourg, where he is managing internships at the ENA (École Nationale d'Administration).

A marked increase in cancer rates

Why did Freysselinard attempt to keep such obvious pollution under wraps? To protect the government, responsible for cleaning up the site? To avoid paying hundreds of thousands of euros to mitigate the pollution? *"The government has made no attempt to address the issue,"* says Guy Augé, Chairman of the Salsigne Residents' Association. *"People are left to their own devices: they're the ones that have to come up with the answers."*

Yet Salsigne's pollution problem is nothing new. Every year, since 1997, the Prefect of Aude has issued the same decree, citing unsafe concentrations of lead, arsenic, cadmium and mercury. The decree cites that is unsafe to consume vegetables (root vegetables and leaf vegetables including cabbage, spinach, lettuce, lamb's lettuce, chard and celery), to use rainwater or river water to water one's garden, to swim in the river, and care should be taken with dust, especially around children. These are the recommendations with which the locals are faced. *"People know what needs to be done,"* says Guy Augé. The tap water, however, is clean: it comes from high up in the Black Mountains, 7km from Salsigne, in an area unaffected by the pollution. A network built in 1930 made Salsigne the first town in the region to be equipped with running water.



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PREFET DE L'AUDE

Arrêté préfectoral n° 2011041-0010 portant suspension de la mise sur le marché des légumes feuilles, des légumes racines, des poireaux cultivés, du thym et des escargots ramassés dans la vallée de l'Orbiel, de ses environs et du site industriel de SALSIGNE (Aude)

CONSIDERANT que des analyses effectuées sur des légumes, des fruits, du thym, des escargots prélevés dans la Vallée de l'Orbiel, ont révélé en 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2005, 2006 et 2007, des concentrations en plomb, arsenic, cadmium et mercure, supérieures aux teneurs au-delà desquelles la sécurité des populations ne peut être garantie ;

ARTICLE 1 :
La mise sur le marché, à titre gratuit ou onéreux, de légumes racines (carottes, navets), de légumes feuilles (choux, épinards, salades, mâche, blettes, céleris branches) et de poireaux, cultivés sur des parcelles inondables, irriguées ou arrosées par des eaux en provenance de l'ORBIEL et de ses affluents, sur les communes de Villanière, villardonnel, Salsigne, Conques/Orbiel, Lastours et Villalier, est suspendue pour une durée d'un an à compter de la publication du présent arrêté.

Despite the measures in place, the locals are the first victims of this polluted environment. In January 2006, *La Dépêche*, one of the three local newspapers exposed what has for years been kept quiet: *"More people die of cancer in Salsigne than elsewhere."*

The figures speak for themselves: more than 11% of cancer-related deaths, irrespective of the cancer type. And for certain cancers, such as those of the lungs or the stomach, this figure is doubled or even tripled. Arsenic, cadmium, chrome and nickel are the culprits. A total of 10,000 individuals are affected, primarily former miners and their families.

Arsenic and poison gas

120 years of surface and subsurface mining. Thousands of tons of rocks that have been dislodged, crushed and treated with chemicals in order to extract valuable minerals. The main French goldmine was also the world's leading producer of arsenic, used both for manufacturing glass and for poison gas, used on the world's various battlefields.

"I wish I'd said no to that money," says Robert Montané today, a former miner and union representative. *"When I was hired in 1975, there was much that was attractive about the job,"* he says. *"The work was varied and there was a spirit of solidarity amongst the miners, especially in regards to the risks of the job."*

This atmosphere of solidarity is evident in the testimonies gathered by Claude Gironis, a former police officer. His father was a miner, his mother a company secretary. He compiled the stories and photos of the residents of La Combe du Saut into a book. 150 people lived here, next to the factory where the minerals were processed. In these photos we witness the life of a place that is now deserted: fairs, festivals, carnivals. A sense of diversity with immigrant populations from North Africa, Spain, Italy and Poland. The smiles of women. And miners proudly posing for the camera. *"This little community was happy, despite how tough the conditions were,"* says Claude Gironis.

The locals had work and were well paid. Before, they used to cultivate the land. With the mining industry, their purchasing power increased. In La Combe du Saut, they had toilets and electricity. It was almost enough to block out the smoke from the two huge chimneys, the smell, and the fine white dust that regularly settled on their houses. The workers inhaled chemicals from the mine and the factory everyday. The women, responsible for washing the miners' clothes, were also on the frontline. The children would play in mountains of arsenic as if it were sand. The risks were known very early on, and the first to know were the authorities. As early as 1932, the Prefecture of Aude and the Minister of Commerce and Industry wrote: *"Salsigne represents 800 workers, i.e.; 3000 individuals. If the factory is causing damage, this is not without affecting the prosperity of the region for the benefit of local trade."*

Work or life?

In Salsigne, employment and economic prosperity were put before the environment and the health of the local people throughout the 20th century. In the late seventies, at the instigation of the toxicologist Henri Pézerat (who would go on to play a leading role in the asbestos scandal), occupational diseases affecting the region's miners were recognized, mainly "primary bronchial

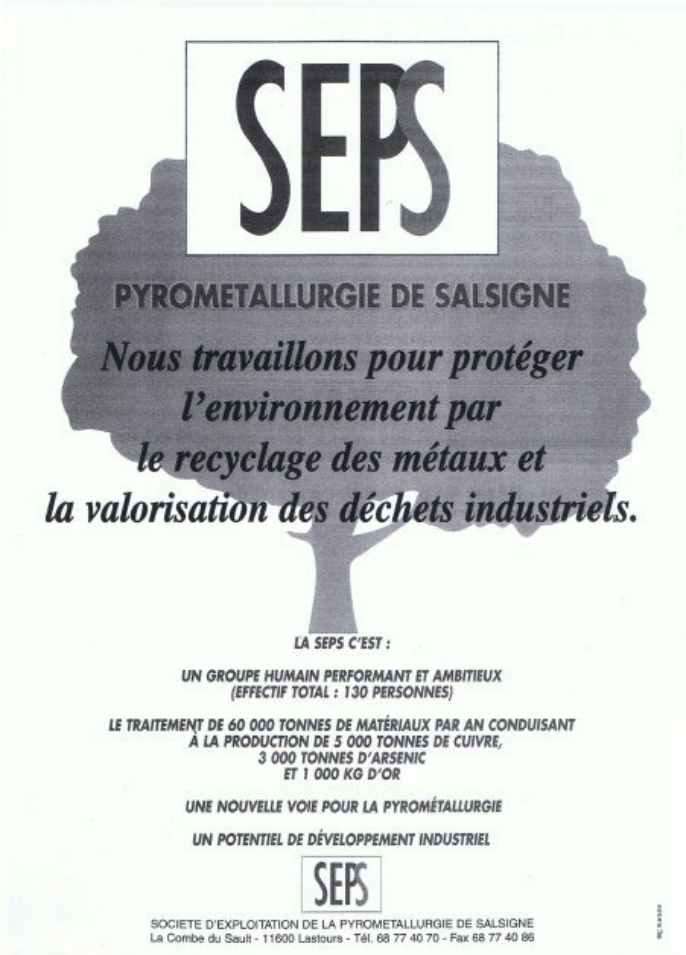
cancers". But while miners were dying, no one breathed a word, neither employees, nor unions, nor companies. Employment had to be maintained, whatever the cost.

One worker dared go against the grain and broke the law of silence. This was in 1995, when the reserves were dwindling and the unions were fighting to keep jobs at all costs. The business had just been split into several smaller companies (one of which was a subsidiary of an Australian mining group), which, through new processes, were attempting to extract several kilos worth of gold and minerals out of the mining waste. *"We tried to get the 20 million francs that we had been promised for Salsigne's remediation,"* recalls Max Brail, in an office of the Lastours town council, a village of 165 people where he has been the mayor for more than twenty years.

In order to revive business, it was not enough for the company SEPS, where Max Brail was employed, to treat waste from the mine. It also incinerated Canal+ set-top boxes and lithium batteries from the army, sent all the way to Salsigne. The incinerator for which Max Brail and his colleagues were responsible was not suitable for such waste. *"The smoke was sickening and the system for extracting arsenic didn't work,"* he remarks. *"I myself was intoxicated and ended up in hospital. Our own lives were in danger as was the environment in which we lived."* In an interview with the local press on the 30th of May 1995, Max Brail spoke out against the polluted environment and the risks for the workers. Upon his arrival at the factory the next day, he was dismissed for serious misconduct. *"I was both an employee at the factory and the Mayor of Lastours. Was I, as an employee, supposed to keep quiet in order to keep food on the table? What was my responsibility as a mayor if I didn't speak out? I knew I was potentially putting my workmates' jobs on the line, but it's not always easy to foresee what will come next […] I had two options: either to go through with what I believed in, prepare myself psychologically for the onslaught, and find myself on the dock . . . but time would tell. Or put a bullet in my head. At the time it was*

very difficult to speak out against working conditions, because employment was presented as a guarantee for the future, but the only future I saw was that our jobs were killing us."

Max Brail lost his job, some of his friends and his reputation. Three CGT trade unionists accused him of burying waste from the mine without consent. He was eventually proven innocent. *"Now people say to me: 'you saved our lives' "*, he says. *"It was a very difficult time but I feel no remorse."* Some of his co-workers died. *"We don't even know some of the stuff we inhaled."* Max Brail has a perforated nasal wall due to inhaling sulphide and arsenic dust, as do many of his former co-workers. *"I loved my job: it was man against matter. There was a feeling of great pride in operating the incinerator around the clock."*



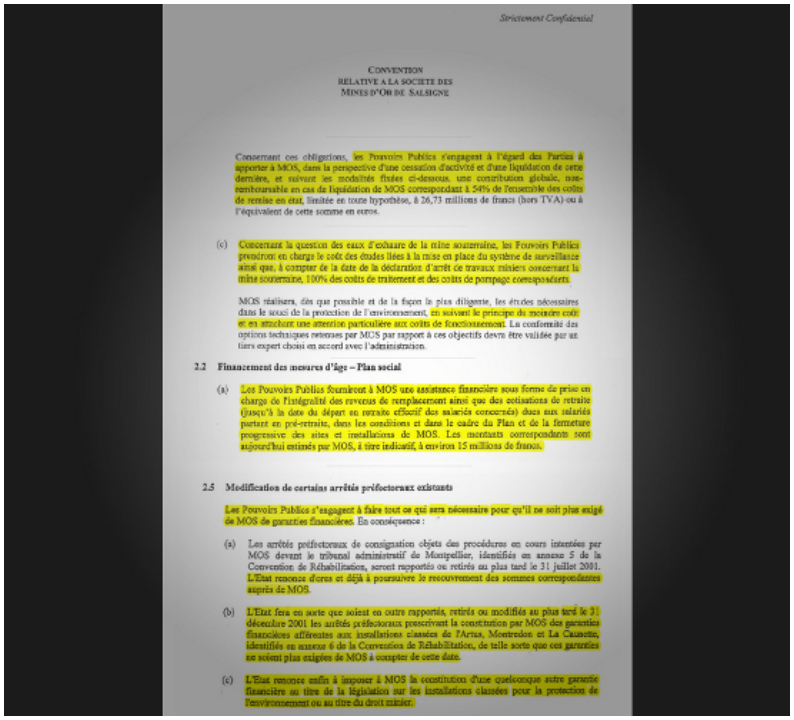
The French State comes to the rescue of private companies

The mine slowed down its activity. SEPS organized its own bankruptcy following the revelation of the pollution generated by the mine. The Australian mining group that owned the company Mines d'or de Salsigne ("Salsigne Goldmines" – MOS) left in 2004. The mining adventure may have come to an end, but the waste remains: nearly ten million tons of rock polluted with arsenic, lead or sulphur are

stored in in various places. They are covered with stones and earth before being revegetated. Sometimes geomembranes are installed underneath in order to prevent groundwater pollution.

ADEME Réhabilitation mine d'or de Salsigne *par serimagefilms*

For over a century, private companies have lined up to get their hands on Salsigne's hidden riches. Yet it is the French State that oversees and finances the site's safety infrastructure, first through ADEME (French environment and energy management Agency) and then through BRGM, whose subsidiary Coframines was the mine's largest shareholder in 1980. The initial total cost for the mine's remediation was estimated at 125 million euros. However, the private companies that mined the site made no contribution. *"The main concern of officials at DRIRE (Regional Directorate for Industry, Research and Environment, whose duties were taken over in 2010 by the DREAL and DIRECCTE) has been to protect industrialists,"* says Guy Augé, of the Salsigne Residents' Association.
From a "strictly confidential" agreement signed in 2001 by the Prefect of Aude and the company MOS, we learn that the French State agreed to take on the responsibility of the remediation of the site exploited by the Australian company, despite the fact that the company was supposed to assume remediation costs. In addition, the French government also made financial contributions to the pension funds of the company's employees.



Strictement Confidentiel

CONVENTION
RELATIVE A LA SOCIETE DES
MINES D'OR DE SALSIGNE

Concernant ces obligations, les Pouvoirs Publics s'engagent à l'égard des Parties à apporter à MOS, dans la perspective d'une cessation d'activité et d'une liquidation de cette dernière, et suivant les modalités fixées ci-dessous, une contribution globale, non-remboursable en cas de liquidation de MOS correspondant à 54% de l'ensemble des coûts de remise en état, limitée en toute hypothèse, à 26,73 millions de francs (hors TVA) ou à l'équivalent de cette somme en euros.

(c) Concernant la question des eaux d'exhaure de la mine souterraine, les Pouvoirs Publics prendront en charge le coût des études liées à la mise en place du système de surveillance ainsi que, à compter de la date de la déclaration d'arrêt de travaux miniers concernant la mine souterraine, 100% des coûts de traitement et des coûts de pompage correspondants.

MOS réalisera, dès que possible et de la façon la plus diligente, les études nécessaires dans le souci de la protection de l'environnement, en suivant le principe du moindre coût et en attachant une attention particulière aux coûts de fonctionnement. La conformité des options techniques retenues par MOS par rapport à ces objectifs devra être validée par un tiers expert choisi en accord avec l'administration.

2.2 Financement des mesures d'âge – Plan social

(a) Les Pouvoirs Publics fourniront à MOS une assistance financière sous forme de prise en charge de l'intégralité des revenus de remplacement ainsi que des cotisations de retraite (jusqu'à la date du départ en retraite effectif des salariés concernés) dues aux salariés partant en pré-retraite, dans les conditions et dans le cadre du Plan et de la fermeture progressive des sites et installations de MOS. Les montants correspondants sont aujourd'hui estimés par MOS, à titre indicatif, à environ 15 millions de francs.

2.5 Modification de certains arrêtés préfectoraux existants

Les Pouvoirs Publics s'engagent à faire tout ce qui sera nécessaire pour qu'il ne soit plus exigé de MOS de garanties financières. En conséquence :

(a) Les arrêtés préfectoraux de consignation objets des procédures en cours intentées par MOS devant le tribunal administratif de Montpellier, identifiés en annexe 5 de la Convention de Réhabilitation, seront rapportés ou retirés au plus tard le 31 juillet 2001. L'Etat renonce d'ores et déjà à poursuivre le recouvrement des sommes correspondantes auprès de MOS.

(b) L'Etat fera en sorte que soient en outre rapportés, retirés ou modifiés au plus tard le 31 décembre 2001 les arrêtés préfectoraux prescrivant la constitution par MOS des garanties financières afférentes aux installations classées de l'Artus, Montredon et La Casanove, identifiés en annexe 6 de la Convention de Réhabilitation, de telle sorte que ces garanties ne soient plus exigées de MOS à compter de cette date.

(c) L'Etat renonce enfin à imposer à MOS la constitution d'une quelconque autre garantie financière au titre de la législation sur les installations classées pour la protection de l'environnement ou au titre du droit minier.

Why did the French State show such partiality to the Australian company mining in Salsigne? In 2001, the Australian industrialist threatened to close shop. *"The State's primary concern was to maintain employment for as long as possible,"* declared mine inspector general François Barthélémy to the TV magazine *Envoyé special* in 2013, when he was in charge of the case. Nothing has changed in a hundred years: as in 1932, employment is deemed more important than the environment and the health of locals.

"They made a start, but everything has been left to fall apart."

After a century of upheaval, nature is now slowly reclaiming Salsigne. It is hard to tell whether the surrounding hills are natural or artificial. Everything has become green again. Yet just a few meters underground, the chemicals have not disappeared. The signs that indicate that the site is dangerous and/or private are very discreet. Water flows into ditches, which are supposed to be inspected by BRGM. But the shed that was used for this purpose has been pillaged. The electronic system used for measuring the level of toxic chemicals in the water no longer works. *"They made a start, but everything has been left to fall apart,"* says an observer of Salsigne's history.

Faced with a limited budget, the French government has to make some choices: should it continue to spend astronomical amounts on cleaning up Salsigne? Or should this money be invested elsewhere? The BRGM, in charge of rehabilitating the site, did not wish to answer our questions or allow us to visit the waste treatment plant in La Combe du Saut. Are the measures undertaken by the French government enough to ensure the safety of the area's residents? Will the artificial land set-up be able to withstand the heavy rainfall that the South-East of France is now regularly subjected to? In 2009 heavy rainfall caused the collapse of a dam enclosing a tailings pond full of end waste. One thing is certain: the pollution is far from going away. *"Every year, seven tons of arsenic are released into the Orbiel, a tributary of the Aude, which then flows into the Mediterranean,"* alerts

François Espuche. The BGRM and academics estimate that, after a century of intense mining, the region will remain polluted for at least 10,000 years!

Another challenge in terms of safety is how much of the region's history will be remembered. *"In a hundred years there will people that will come and do motocross or quad biking in the hills. They won't know that they are stirring up toxic dust,"* warns former miner Robert Montané. Tourists walking in the area are often unaware that the path leads them to a former site where toxic waste is stored. And there are few signs that warn of the dangers they are exposed to.

Will the mine be reopened?

The curse that plagues the region of Salsigne is far from being over. *"I'm sick of carrying the flag,"* stated former miner Robert Montané, in 2013, at a conference held around the mine. *"He carries the flag at the funerals of his former colleagues affected by cancer,"* explained one of the participants. As cancer can appear many years after being exposed to chemicals, there may be many more of these victims. Yet mining in the region could resume. A short drive from Salsigne, the Linnon dam traps water that flows down from the mountain. Officially, this reservoir is used to fight forest fires. Unofficially it keeps pollution out. Sometimes people come to fish here. *"New trout are introduced on Fridays. The following Wednesday, those that have not been caught are dead, floating on their backs,"* says a local. At the end of October, when the reservoir is at its lowest, the walls are covered in a thick white layer of arsenic. Several meters above, one can make out the former mine of Loubatière between the trees.

This is the site that two entrepreneurs have set their sights on: Olivier Bernard and Sébastien d'Arrigo, partners in the company Or&Vintage, specializing in precious metal trading. It would seem that approximately 30 tons of gold and rare earth elements are still buried there. The estimated mine life is thirty years. With a selling price of around 30,000 euros per kilo of gold, the industrialists are hoping to convince many investors to join them in their venture, in particular from the City of London. But this time of course everything will be environmentally responsible. Chlorination will replace "cyanidation". There's even talk of using a derivative of corn starch, which works in the same way as cyanide but without its drawbacks. *"Today industrial activity doesn't have to impact negatively on ecology, nor do we have to forgo our citizen obligations,"* stated the two associates to the newspaper *La Dépêche* last April.

In these times of persistent unemployment, the job argument will certainly be put forward in the economically devastated region. The enormous global demand for minerals and the unconcealed desire of French authorities, particularly the former Minister of Industrial Recovery, Arnaud Montebourg, to redevelop the mining sector in France, could reignite gold fever in the underbelly of the Black Mountains. It's as if history were eternally repeating itself, mocking the lessons of the past.

Simon Gouin

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Photo credits: Le Journal du CNRS, Simon Gouin, François Espuche, Claude Gironis