Archive Sub-Versions: Photography, the Accident, and the Biopolitics of Extraction

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Doctor of Philosophy

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During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

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Abstract

The documentation of work accidents takes place in a tension between production and destruction, the archivable and the unarchivable, the biopolitical governing of labour and the speculative economics of capitalist Extractivism. This research, led by practice, takes a multi-disciplinary path to analyse the normalisation of work accidents through the study of photographic documents produced by a former coal mining company in the Northeast of France. These are now deposited in the public archives of the *Centre des Archives Industrielles et Techniques de Moselle* * which holds the greater part of the records yielded by *Houillères du Bassin de Lorraine***, one of the nine regional sections of *Charbonnages de France* ***, the mining conglomerate disbanded in 2007. While a widely occurring social and economic reality, work accidents are paradoxically under-studied as is often acknowledged by sociological studies. The work accident highlights the contradiction in which the body of the worker is caught: while the biopolitical and industrial logics of extraction depends on its productive force, its exposure to the risk of injury or death is admissible, even normalised.

Coal mining is considered as a particular historical incarnation of capitalist Extractivism which encompasses but is not limited to the extraction of natural resources. While extraction leads to capital accumulation, the work accident leads to its disruption or delay, and to a qualitatively different form of accumulation, that of documents. Photographic documents of work accidents are invaluable tools for a critical analysis of a form of power that legitimises the risk of injury and death at work, in the name of profit. The relationship between the work accident and photography is approached from the perspective of a biopolitical and *dispositival* analysis of corporate archival practices derived from Michel Foucault. A *dispositival* analysis emphasizes the heterogeneity of strategic mechanisms and techniques deployed by biopower to regulate the aleatory. Photography is understood as one such mechanism, inscribed in the material and infrastructural *dispositif* of the archival-industrial complex and in an economy of power relations.

The research's aim is twofold: to analyse how photographs of work accidents and of accidents simulations functioned as materially and logically correlated to the process of extraction; and to probe the tension between the normative effects of these photographs and the unruliness of an affective response to them by a viewer or an interpreter. Roland Barthes' notion of punctum is invoked to account for the transformative power of affect and the emergence of an other value of the photographic document. I develop artistic methodologies engaging with the archive conceived as an infrastructural ensemble – itself deriving from a past industrial extractive complex – while re-envisioning photographic reproducibility in a tension between the logistics of documentation and affective resonance. Such interventions endeavour to reconfigure archival consignation and give a formal expression to relations – between accidents, their documents, and subjects – that might have been obscured by corporate logics and, in this instance, the relocation of documents to the public archive.

Keywords: (Work) Accidents, Affect, Archive, Biopolitics, Biopower, Extraction, Extractivism, Infrastructuralism, Photography.

*   The Industrial and Technical Archives Centre of Moselle.
**   The Collieries of the Lorraine Basin.
***   The French National Coal Board.

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The caption reads:
"*En un point de chargement en bowette, équipé d'un treuil de halage pour le ravancement des trains, le chargeur se fait happer le bras droit par le câble du treuil: arrachement du bras, blessures multiples, mort instantanée.*" (At a loading point, equipped with a tow winch for advancing trains, the loader is caught with his right arm by the winch cable: tearing off the arm, multiple injuries, instant death.) (My translation)

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The caption reads:

Le 11.4.60, en cours de poste, un manoeuvre balayeur se chargea de remplir d'huile les graisseurs à pots du palier de l'arbre des bobines d'une machine d'extraction, pendant la marche de la machine. [...] La veste, la chemise, le maillot de corps s'enroulèrent autour [...] de l'arbre et le malheureux, projeté sur le sol, fut blessé très grièvement à la tête et à la partie supérieure du corps et décéda le lendemain. (On 11.4.60, during his shift, a sweeper decided to grease the shaft bearing the coils of an extraction machine with oil while the machine was running. [...] The jacket, shirt, undershirt wrapped around the coil and the unfortunate man, thrown on the ground, was seriously wounded at the head and upper part of the body and died the next day.) (My translation)

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Acknowledgements

Abbreviations

Institutional names

BRGM   Bureau de Recherches Géologiques et Minières (The Bureau of Geological and Mining Research, part of the French Geological Survey)

CAITM   Centre des Archives Industrielles et Techniques de la Moselle (The Industrial and Technical Archives Centre of Moselle)

CdF   Charbonnages de France (The French National Coal Board)

CERCHAR   Centre d'Étude et Recherches de Charbonnages de France (Study and Research Centre of the Collieries of France)

HBL   Houillères du Bassin de Lorraine (The Lorraine Basin Collieries Company)

Sources

CL   Barthes, Roland. *Camera lucida: Reflections on photography*. Translated by Richard Howard. London: Vintage, 1993.

CFL   Lawlor, Leonard and John Nale, eds. *The Cambridge Foucault Lexicon*. Cambridge: Cambridge UP, 2014.

DP   Foucault, Michel. *Discipline and Punish: The Birth of the Prison*. Translated by Alan Sheridan. New York: Vintage Books, 1977.

SMBD   Foucault, Michel. *Society Must Be Defended: Lectures at the Collège de France, 1975-1976.* Translated by David Macey. London: Penguin Books, 2004.

The Work Accident, Extraction, and the Archival-Industrial Accumulation of Documents
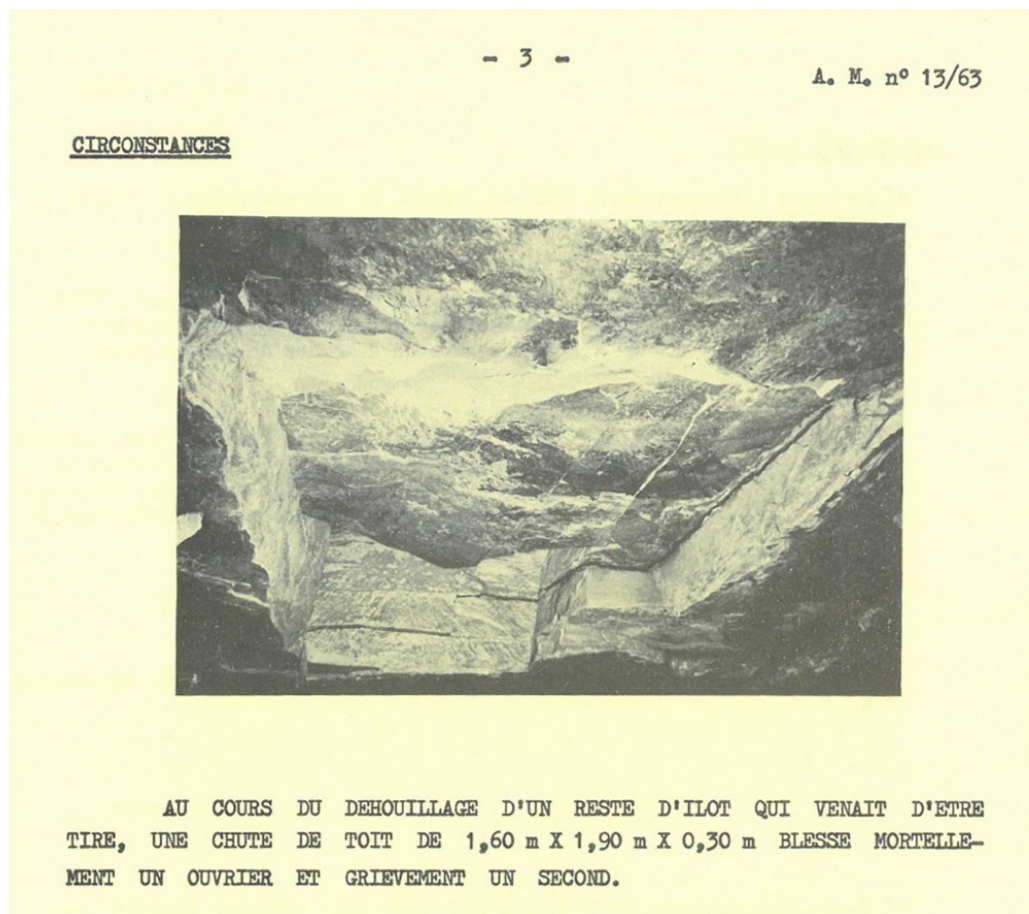
Figure 1. Photographer unknown, "Untitled [fatal accident 13/63]," c. 1963. [1] Fatal accident 13/33. Photograph originally © Houllières du Bassin de Lorraine (HBL). Public domain. Reproduced courtesy of Centre des Archives Industrielles et Techniques de la Moselle (CAITM), Saint-Avold, France.

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[1] "During the removal of a remnant of an isolated bloc of coal that had just been blasted, a roof section of 1.60 m x 1.90 m x 0.30 m fell, fatally wounding a worker and gravely a second one." (My translation) Photograph commissioned by the now disbanded coal mining company HBL, showing the site of a fatal accident. For details on Figures see the List of illustrations and tables.

The photograph carries the image of the work accident into a future that may outlive a regime of economic production that normalised risk, life-threatening danger at work, and the expenditure of life in the name of surplus-value. In such a future, the reality that the imaged accident transmits may sit in utter discordance with a truly progressive model of liberated labour according to which the coerciveness of wage labour could never coincide with the normalisation of injury or death inducing work conditions.[2] While the archive may be the locus for the future preservation of the documents of work accidents, the interventions of an art practice with regards to archival documents may perpetuate the dissemination of an accident's image and its effects in entirely new conditions. However, in the confinement of a collapsed topography, under the threat of further imminent danger, in the amalgamation of dust and flames, or in the toxicity of an unbreathable atmosphere, there is no place, nor time for the shaping of a photograph, nor for that of any other form of document. In the context forming the basis of this research, i.e., the extractive context of coal mining, the work accident may not be photographed in its actuality.[3] It is often documented in its aftermath, and while the resulting representation may only be fragmentary, it is often constituted of a plurality of forms and media, which may include the photographic documentation of an accident's aftermath, its re-enactment, or its simulation, schemas or maps, forensic discursive analyses, or testimonial accounts. Faced with a fragmentary multiplicity of photographic and other forms of documents and representations, and in the possible absence of a photographic record, I search the vast, heterogeneous territory of the archive[4] for connected or surrogate photographs, or for images given shape in workers' testimonies or other forms of accounts, which may complete or supplement the approximate, speculative, and spectral images forming and laying at unrest in my mind. In this process, I become receptive to a power of reverberation across the multiplicity and heterogeneity of documents, whereby a photograph may echo another in a wider resonance or composition in the process of reading, reproducing, and reconfiguring photographic documents. Underlying the historical

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[2] The morbidity and mortality associated with occupational disease may sometimes be directly linked to industrial accidents, while also highlighting the problem of industrial risk from the perspective of the exposure to toxic substances and the corporate management of (ill)health. A discussion of occupational disease and its documentation is however beyond the scope of the present research and will only be referred to in a limited way.

[3] This is due to practical and technological limitations, the absence of continuous monitoring or recording capabilities, and lack of safety. The use of electric flash when photographing in underground coal mining environments presented risks of explosion. It is only from 1952 that a new flash technology (*flash anti-déflagrant*) introduced in England allows for safer conditions in photographing underground coal mines. And it is only from 1955 that it started being used by CERCHAR, the *Centre d'Etudes et Recherches du Charbon*, a research centre part of *Charbonnages de France* (CdF). See Michel Peroni and Jacques Roux, "La validité documentaire de la photographie. Le travail au fond de la mine," in *Archives sensibles. Images et objets du monde industriel et ouvrier*, directed by Noëlle Gerome (Cachan: Éditions de l'École normale supérieure de Cachan, 1995) 41-42 and 57.

[4] *Le Centre des Archives Industrielles et Techniques de la Moselle.*

specificity of accidents, their connectedness – structural, material, political – may be given a formal expression. An artistic practice may produce a register that takes account of the historicity of accidents, this process of reverberation, and the emergence of an affective dynamic between the reality photographed, documents, and subjects.

The work accident may first be defined as a type of accident that occurs in a relation of subordination – of a worker to their employer[5] – and which reveals a hierarchised experience of death, injury, or disease, at work. The work accident highlights the contradiction in which the body of the worker is caught: while its centrality as living, productive force encroached upon in the biopolitical and industrial logics of extraction is asserted, its exposure to the risk of death or injury is however admissible or normalised. Coal mining is considered as a particular historical incarnation of capitalist extractivism understood in its expanded acceptation[6] to encompass the extraction of natural resources while including other forms of extraction that are characteristic of digital capitalism and financialization for instance.[7] This research takes photographic documents of work accidents as objects of study to problematise the normalisation of such accidents in the biopolitics of extraction while arguing for the disjunctive agency of photographs in the material, infrastructural economy of the archival-industrial complex of a corporation through the notion of affect. Moreover, while the extractive, productive event constitutes the site of capital accumulation, the work accident is understood as the site of the disruption or delay of such accumulation, as well as that of a qualitatively different form of accumulation: of forensic documents (including photographs), of administrative, medical, and legal records,[8] or of techno-scientific knowledge. Furthermore, while a widely occurring social and economic reality,[9] work accidents are paradoxically under-studied and lack

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[5] Véronique Daubas-Letourneux, *Accidents du travail: des blessés et des morts invisibles*, (Montrouge: Bayard, 2021) 16.

[6] For a discussion of expanded concepts of extraction and Extractivism, see Verónica Gago and Sandro Mezzadra, "A Critique of the Extractive Operations of Capital: Toward an Expanded Concept of Extractivism," *Rethinking Marxism*, 29:4 (2017): 578-579. See also: Martín Arboleda, *Planetary Mine: Territories of Extraction under Late Capitalism*, (London; New York: Verso, 2020).

[7] Extractive operations today, such as the mining of digital data, enable new processes of dispossession, *on a continuous basis,* which is discussed as constituting a continuous form of primitive accumulation with reference to David Harvey's and Rosa Luxemburg's works. See Gago and Mezzadra, "A Critique of the Extractive Operations of Capital," 585-586.

[8] As noted by Gilbert Mury: "Dans le cadre des institutions officielles, un accident de travail c'est d'abord un dossier." (In the context of official institutions, a work accident is first and foremost a dossier) In Gilbert Mury, *Le sang ouvrier,* (Paris: Les Éditions du Cerf, 1974) 7.

[9] A joint report by the World Health Organization (WHO) and the International Labour Organization (ILO) estimates that work-related diseases and injuries were responsible for the deaths of 1.9 million people in 2016. See *WHO/ILO joint estimates of the work-related burden of disease and injury, 2000-2016: global monitoring report*. Geneva: World Health Organization and the International Labour Organization, 2021.

visibility as is often acknowledged by sociologies of accidents.[10] It may therefore take epochal transformations such as the de-territorialisation effected by de-industrialisation for the release of the documents of work accidents from the secrecy of corporate records to take place.

The *Centre des Archives Industrielles et Techniques de la Moselle* (CAITM) is situated at the fringe of a vast expanse of forests, in Sainte-Fontaine, a district of the town of Saint-Avold in the Lorraine region (France), whose population, until the 1980s, was mainly employed at the coal mining site located at its outskirts. A short walk away from the archives, remnants of the Sainte-Fontaine colliery stand abandoned, destined to a different fate than the former warehouse that was repurposed to house CAITM's holdings. The two sites constitute two different modalities of becoming for former industrial sites – the ruin and the archive. At the derelict mine, signage warns off potential trespassers, locking the ruin away in the strange order of video-surveillance and property management.[11] Another walk away from the archives, a larger abandoned site,[12] stands in a relative state of dereliction, while a small equestrian centre has set domicile on its perimeter. Some mining sites have been granted the status of heritage sites (museums, archives, or monuments),[13] or may have been re-purposed as leisure parks or commercial entities. The Sainte-Fontaine mine, which closed in 1986, would reveal to have been particularly dangerous to exploit, exposing workers to constant risks of explosions. Three major accidents in 1919, 1959, and 1961, would lead to the death of 70 workers and numerous casualties.[14] Sainte-Fontaine, however, only represents one of the seven main collieries in the Lorraine region,[15] each of them presenting its own history of work induced casualties and fatalities.

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[10] Most recently, Daubas-Letourneux's study of work accidents in France highlights that while they occur widely in society work accidents are not very visible in the media. For instance, 2019 statistics for the private sector account 14 deaths and 12500 injured per week in France alone. In Daubas-Letourneux, *Accidents du travail*, 12. Sami Dassa points out that while work accidents constitute a problem that is more diffuse, permanent, and structural than unemployment or turnover, they remain secondary to more conjunctural issues in sociological inquiries. See Sami Dassa, *Sociologie des accidents,* Conservatoire National des Arts et Métiers, Laboratoire de sociologie du travail (rapport ronéotypé), 1974, 5, in Daubas-Letourneux*, Accidents du travail*, 13.

[11] Closed coal mining sites in Moselle are owned by the Établissement Public Foncier de Lorraine (EPFL), part of the state-owned land management organisation, Établissement Public Foncier du Grand Est (EPFGE). https://www.epfge.fr/; https://www.data.gouv.fr/en/datasets/observatoire-des-friches-en-lorraine/.

[12] The former mine of Cuvelette which also comprised a school aimed at training mining apprentices from the age of sixteen.

[13] Such as the colliery of Wendel-Vuillemin now a museum, the Musée Wendel, in the town of Petite-Rosselle, France. The *Carreau Simon* (Simon colliery) in the town of Forbach, which was the site of the last mining disaster in France in 1985, was granted the status of national monument in 2002. See *Monumentum: Carte des Monuments Historiques français.* https://monumentum.fr/carreau-siege-simon-pa57000015.html.

[14] Emilie, Perrot, "Freyming-Merlebach: dans l'enfer de Sainte-Fontaine," *Le Républican Lorrain*, August 21, 2018.

[15] In Lorraine coal mining was carried out in the following seven collieries: Simon, Wendel, Merlebach, Sainte-Fontaine, La Houve, Folschwiller and Faulquemont. See: Commission des Communautés Européennes. "La reconversion des bassins houlliers en France," *Cahiers de reconversion industrielle* 22, Brussels, June 1972, 112.

Figure 2. Armelle Skatulski, *Untitled* (*Après-coup* series), CAITM, 2015.

Figure 3. Armelle Skatulski, *Untitled* (*Après-coup* series), CAITM, 2017.

Statistical records of mining accidents accounted for yearly or monthly, paint a dark reality. Large-scale collective mining accidents across France, referred to as *catastrophes* (disasters), have galvanized popular and media attention, while smaller-scale or individual incidents may have been consigned purely quantitatively *as statistics* in the administrative records of each site (see Appendix 1). While the 1906 disaster of Courrières, in which a coaldust explosion led to the death of 1099 workers, remains one of the deadliest mining accidents to date worldwide,[16] the history of coal mining is marked by a long series of large and smaller scale accidents, and it is rare that a site would have been spared from this reality.[17] While mining fatalities are now consigned as historical facts in Lorraine, the research acknowledges their occurrence in regions linked to new extractive geopolitics.[18]

NOMBRE MOYEN ANNUEL D'ACCIDENTS

	Charbon		Fer		Autres mines		Carrières souterraines		Carrières à C. O.
	F	J	F	J	F	J	F	J	
1901-1910	26 635	4 039	1 866	272	540	176	1 312	375	4 089
1911-1913	42 270	6 707	5 672	637	761	247	1 560	268	5 874
1919-1920	38 246	8 471	1 731	416	527	318	725	177	1 994
1921-1930	78 427	11 257	9 718	1 293	2 111	755	1 963	987	5 702
1931-1938	72 688	9 942	8 557	919	1 751	553	1 096	1 009	6 186
1941-1944	135 007	21 413	7 082	1 232	2 333	795	1 315	1 212	2 819
1945-1950	176 459	29 470	9 481	1 603	5 053	2 310	2 202	1 719	8 761
1951-1955	107 552	15 037	11 125	1 994	4 454	2 495	2 487	1 514	13 732
1956-1960	70 127	9 669	5 008	1 160	2 649	1 894	2 107	1 048	9 308
1961-1962	41 350	5 960	2 972	762	2 335	1 769	1 299	846	7 700

Figure 4. Table 1. André Dardalhon, *Nombre annuel moyen d'accidents*, 1965. Annual average of accidents in mines and quarries in France between 1901-1962.[19] Table © *Annales des mines*, all rights reserved. Published with the courtesy of Le Conseil Général de l'Économie, de l'Industrie et des Technologies (CGEIET).[20]

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[16] For a powerful account of the Courrières disaster see Diana Cooper-Richet, *Le peuple de la nuit. Mines et mineurs en France (XIXe-XXe siècle)*, (Paris: Perrin, 2002) 239-244.

[17] Cooper-Richet, *Le peuple de la nuit,* 109.

[18] In the current geopolitics of extraction Latin American economies have regained their classical role of provider of raw materials (mainly directed at China): from gold mining in Peru to hydrocarbon exploitation in Bolivia and Ecuador; from coal mining in Venezuela, Columbia, and Brazil to opencast iron mega mines in Uruguay. See Gago and Mezzadra, "A Critique of the Extractive Operations of Capital," 576.

[19] The letters "F" and "J" correspond to "fond" (underground) and "jour" (day), referring respectively to "underground" and "overground" or "surface" work. From André Dardalhon, "Evolution de la Sécurité dans les mines de charbon, minières et carrières de 1841 a 1962," *Annales des mines* n.° 1 (1965): 55.

[20] Dardalhon, "Evolution de la Sécurité dans les mines de charbon, minières et carrières de 1841 a 1962," *Annales des mines* n.° 1 (1965): 55. CGEIET is part of the Ministère de l'Économie, des Finances et de la Souveraineté Industrielle et Numérique (the French Ministry for the Economy, Finance, and Industrial and Digital Sovereignty).

CAITM holds the greater part of the records yielded by *Houillères du Bassin de Lorraine* (HBL),[21] one of the nine regional sections of *Charbonnages de France* (CdF),[22] the French mining conglomerate that was operative until 2007.[23] The archives comprise a vast collection of photographs, audio-visual materials, maps and architectural drawings in excess of 100, 000 items,[24] a library of periodicals and books, administrative records such as personnel files, medical records, and a variety of technical and statistical records pertaining for instance to production, health and safety, collective and individual accidents, or the management of geological risks.[25] The centre contains about 9 km of linear paper archives[26] spanning from 1816 to 2007.[27]

HBL, created during the nationalization of mines in 1946, extracted coal until 2004, employing a great number of workers, up to 45,000 people in the 1960s for instance,[28] thus constituting one of the largest employers in Lorraine. It is generally considered that the company was keen that its records be preserved to testify to the unprecedented economic development which the region experienced in the 19th and 20th centuries.[29] When CdF was dissolved in 2007, the building which now houses CAITM, then a former mining equipment storage warehouse, was bought by the General Council of the city of Saint-Avold for a symbolic sum and inaugurated as a public archive in 2011. CAITM is solely dedicated to the history of industrial activity in the Moselle County with holdings mainly pertaining to HBL.[30]

Another section of the archival records of CdF, referred to as its "(useful) technical archives," have been transferred to a regional branch of *Bureau de Recherches Géologiques et Minières* (BRGM).[31] These are documents essential for the management of crisis situations that may occur after the closure of mining sites such as subsidence, the gradual sinking of land linked to former

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[21] The Lorraine Basin Collieries Company.

[22] The Collieries of France.

[23] On the disbanding of CdF, see "Liquidation des Charbonnages de Frances," France Archives, Portail National des Archives. https://francearchives.fr/en/facomponent/d73c6251a9f87a8e2b17e5d887c10936aec520f8.

[24] Véronique Tison, "Le bassin minier a son centre d'archives," *Revue Française de Généalogie*, 9 March 2012.

[25] This list is by no means exhaustive. The great part of the archival inventories of CAITM are available at: http://www.archives57.com/index.php/recherches/inventaires/category/62-caitm.

[26] Pascal Even, "La sauvegarde de la mémoire de Charbonnages de France. Une priorité de la Direction des archives de France," *Documents pour l'histoire des techniques* 16.2 (December 2008): 35.

[27] Philippe Creux, "Des kilomètres d'archives et une mine d'infos sans égale," *Le Républicain Lorrain*, 20 August 2019.

[28] Tison, "Le bassin minier a son centre d'archives," 2012.

[29] Tison, 2012.

[30] Other holdings relate to the iron and steel industries, crystal glass manufacturing, and the tobacco and garment industries, notably the Saint-Louis crystal glass manufacturer, the Metz tobacco manufacturers, and the Bataville-Heillocourt shoe factory.

[31] The Bureau of Geological and Mining Research is part of the French Geological Survey, a government agency. It is France's public reference institution in Earth Science applications for the management of surface and subsurface resources and risks. https://www.brgm.fr/en.

extraction.[32] What is referred to as "post-mine management" requires that these documents be made immediately accessible.[33] The site, another instance of the repurposing of former industrial facilities, still bears the marks of its history,[34] while some miners have become archivists and the safekeepers of documents used in the management of geological risk.

As coal mines were the main source of employment for this region,[35] the permanent closure of HBL in 2004[36] by legislative reform[37] can only have left deep marks, economically and societally.[38] An archive that was once generated as the result of the administrative, technical, and extractive activities of an industry, now also constitutes the symptom of a wider process, that of de-industrialisation, linked to the decreased international competitiveness of CdF.[39] While a shift to a post-Fordist economy centred on services, information, and distributed forms of labour processes enabled by digitalisation[40] has led to digital forms of extractivism worldwide, the process of de-industrialisation is linked to new geopolitics of the extraction of natural resources.[41]

In the context of this epochal transformation, an economy revolved around industrial production has been dismantled giving way to an economy centred on cultural regeneration and patrimonial preservation, where former industrial sites, when repurposed, now function as museums or archives, while others, left abandoned, have become ruins imbued, for some, with the spectral effects of the eradication of a vast apparatus of extraction. CAITM, and the labour undertaken by its archivists, may be understood as sustaining this type of memorial economy. Furthermore, its holdings have been kept distinct from the *Archives Nationales du Monde du Travail* [42] in Roubaix in order to keep mining communities in contact with their heritage.[43] In this respect, CAITM constitutes an important resource for communities by, for instance, enabling genealogical research or running public

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[32] The so-called "useful" technical archives entrusted to BRGM are essentially made up of technical plans, cadastral plans, mine logs, exploitation registers, mining damage files. See: Even, "La sauvegarde de la mémoire de Charbonnages de France," 38.

[33] Even, "La sauvegarde de la mémoire de Charbonnages de France," 37.

[34] BRGM is housed in HBL's former Mining Rescue Centre and still contains the replica of an underground mining gallery which was used to train rescue teams.

[35] Philippe De Ladoucette, "Charbonnages de France et la société française," *Annales des Mines* (May 2004): 8.

[36] BBC, "France closes its last coal mine," *BBC* [website], 23 April 2004.

[37] Conseil Administratif des Charbonnages de France, *Rapport d'activité 2003*, 31 December 2003, 8.

[38] See for instance concerns expressed by syndicalist groups in questions put the French Senate in 2003. Published in the French Senate's Official Journal: Journal Officiel du Sénat, "Fermeture des Houillères du bassin lorrain." *Journal Officiel du Sénat,* 19 March 2003.

[39] De Ladoucette, "Charbonnages de France et la société française," 10.

[40] For a problematisation of 'post-industrial society' within a shift to post-Fordism see Kumar, Krishan. *From Post-Industrial to Post-Modern Society: New Theories of the Contemporary World*. Oxford and Cambridge: Blackwell Publishing, 1995.

[41] Martín Arboleda emphasises the shift of the geopolitics of extraction from Western countries to Latin America in Arboleda, *Planetary Mine,* 8-9.

[42] The National Archives of the World of Work.

[43] Tison, "Le bassin minier a son centre d'archives," no pages.

engagement events (e.g., exhibitions and educational workshops). Its reading rooms attract researchers from varied fields, including legal experts representing former coal miners in court cases regarding issues such as work-related ill-health (mainly silicosis or asbestosis), or collective rights enshrined in "*le statut de mineur*" (the (coal) miner status).[44]

While acknowledging the historical and political value of these archives as public institutions,[45] this research highlights the uncanny of the corporation become (public) archive, releasing the image of the work accident for all future readers to see, interpret, and analyse. In a general sense, it seeks to link the material economy of the public archive as institution to that of the archival and extractive practices of the former corporation, which requires to problematise the archive (and photography) from the perspective of an industrial modality of archiving, while a *dispositival* analysis (see Chapter 3),[46] undertaken with reference to Michel Foucault's analysis of biopower will probe what it means to consider the work accident and its (photographic) documentation in an economy of power relations and a biopolitical management or governing of workforces.

It is as a member of a mining community that I am drawn to these photographic and textual archives of work accidents. In the wake of the dissolution of CdF, like many I witnessed and experienced de-industrialisation and the marks it left on these communities. I made photographs that explored the post-industrial ruin as constituting a document of precarity and dispossession: *Absent Machine* (2015-2016) is a photographic series in which I contrast two different forms of futures for post-industrial sites: the ruin and the archive. In this series, photographs of the archive are juxtaposed with photographs of industrial ruins as two types of sites released of productivist purpose – each allowing for a different form of affective engagement.[47] My journey to the industrial ruin led me to the mine-turned-archive and to the study of representations of work accidents.

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[44] Established by law in 2004, the *miner's status* guarantees the maintenance of economic rights for coal miners beyond the closure of CdF. See "Loi n° 2004-105 du 3 février 2004 portant création de l'Agence nationale pour la garantie des droits des mineurs et diverses dispositions relatives aux mines." (Act No. 2004-105 of February 3rd, 2004, establishing the National Agency for the Guarantee of the Rights of Miners and various provisions relating to mines) *Journal officiel "Lois et Décrets"* (JORF) n° 0029 du 4 février 2004.

[45] As CdF were nationalised in 1946 the records or archives produced by its various regional companies became, by definition, public, as the archives of nationalised companies were integrated into the field of public archives by the law of 3 January 1979, Heritage Code, Book II. See Even, "La sauvegarde de la mémoire de Charbonnages de France," 31-32.

[46] For a discussion of the critical significance of the concept of *dispositif* as introduced by Michel Foucault see: Rabinow, Paul and Nikolas Rose. "Foucault Today," in *The Essential Foucault: Selections from the Essential Works of Foucault, 1954–1984*. New York: New Press, 2003, xv.

[47] I also considered how former industrial sites are re-purposed into institutions with a heritage or memorial function (former warehouses into archives; mining sites into museums; a security training centre now a geological archive).

Stepping into CAITM I discovered a vast corpus of documents that has allowed me to learn about a world to which I have always only had partial access – mainly through testimonies of relatives, friends, and neighbours, and accounts in the local or national media. I am drawn to the topic of work accidents as I am, as a subject, inscribed in the ripple effects of a reality that was laden with danger. The realisation that members of the community I was born into could and did die at work came at a very early age and left indelible marks. In choosing to work with these archives of work accidents, I was therefore recognising, if not altogether consciously, an existential involvement with members of my community, dead and still living. It is not without a certain amount of anxiety and ethical concerns that I made this choice. But I felt compelled to step into this study. Furthermore, I have come to understand the documents that I have sought and researched as a form of collective inheritance.

Archival research, artistic interventions, writing about photographic documents, and the application of theoretical models to the analysis of documents, have informed and complemented one another, allowing me to tackle the complexity of my subject from a multi-faceted perspective. A substantial part of the research was constituted by time spent in the archives and with its documents. I visited CAITM on numerous occasions to closely study and analyse photographs of work accidents, of simulations of work accidents, and their accompanying texts and schemas. As I grew more familiar with the documents it became clear to me that, beyond their status as objects to be analysed, they were invaluable tools for a critical analysis of a form of power that legitimises the risk of injury or death at work in the name of profit. The activity of searching for, of selecting, reproducing, and saving copies of documents, and that of reading and writing about photographs, has constituted a structuring force for the general organisation of my thesis while providing the material basis from which to weave a form of analysis informed by experience as well as by theoretical discovery.

My search for a wholistic model of analysis that would allow me to analyse the historical reality of work accidents, their documentation, and their link to the world of extraction, led me to the work of Michel Foucault and to the concept of *dispositif*. The latter prompted me to not only consider the documents of work accidents from the perspective of an economy of power relations and of a heterogeneity of power mechanisms, but also to situate and reflect on my own interventions in the archive. An interpretation of the corporate archive and its documents as *dispositif* allowed me to re-envision the public archive as stemming from the material economy of a past extractive complex. The public archive to which I have access, is therefore also the archive of different scales of the stratification of industrial power. The process of searching for documents, of retrieving them from a specific order of classification, of transferring them by applying different techniques of reproduction (from digital scans to silk screens and prints), unwittingly became a test of the persistence of affect, from format to format, so to speak. The recognition of this affective dynamic led me from a

consideration of the photographic archives as *dispositif* to an infrastructuralist analysis of both these archives and my own working process, in which I contrast a logistics of information with the transformative power of affect.

Tableau n° 9   NOMBRE DE TUÉS DE 1861 A 1962 (sauf 1939 et 1940)

	Tués au Fond											Tués au Jour	Fond et Jour
	Feux Incendies	Grisou Poussières	Asphyxie	D. I.	Explosifs	Éboulements	Puits et bures	Roulage	Inondation	Divers	Total		
	Nombres absolus de tués												
Charbon													
Nord - Pas-de-Calais . . .	33	1 569	123	5	220	3 588	1 147	1 137	5	735	8 562	1 458	10 020
Lorraine	8	140	24	»	47	565	193	215	2	173	1 367	284	1 651
Bourgogne - Nivernais . .	54	211	18	»	23	343	169	82	13	73	986	136	1 122
Loire	99	1 102	39	1	72	1 173	550	262	10	208	3 516	361	3 877
Auvergne - Bourbonnais . .	5	52	26	40	30	334	207	67	4	46	811	77	888
Gard-Hérault.	8	175	37	161	64	745	194	159	114	127	1 784	212	1 996
Tarn-Aveyron	21	103	30	»	48	376	101	113	9	84	885	195	1 080
Alpes	1	4	4	8	16	131	16	24	1	10	215	22	237
Provence	6	32	7	»	13	156	34	35	2	24	309	35	344
Autres bassins	9	72	45	»	17	294	143	55	15	62	712	85	797
Total . . .	244	3 460	353	215	550	7 705	2 754	2 149	175	1 542	19 147	2 865	22 012
Fer													
Lorraine	—	—	—	—	—	—	—	—	—	—	—	—	2 943
Autres bassins	—	—	—	—	—	—	—	—	—	—	—	—	688
Total . . .	»	1	14	»	366	1 992	131	424	»	231	3 159	472	3 631
Autres mines	34	31	26	»	152	407	218	104	»	144	1 116	270	1 386
Carrières souterraines	4	3	54	»	163	1 613	517	46	»	265	2 665	138	2 803
Carrières à ciel ouvert . . .	»	»	»	»	»	»	»	»	»	»	»	7 371	7 371
Travaux de recherches	»	4	2	»	2	12	4	4	»	3	31	13	44
Total général . . .	282	3 499	449	215	1 233	11 729	3 624	2 727	175	2 185	26 118	11 129	37 247
	Nombre de tués pour 3 millions de postes												
Charbon													
Nord - Pas-de-Calais . . .	0,05	2,52	0,20	0,01	0,35	5,77	1,85	1,83	0,01	1,18	13,77	5,96	11,57
Lorraine	0,13	2,20	0,38	»	0,74	8,90	3,04	3,39	0,03	2,73	21,54	8,32	16,92
Bourgogne-Nivernais . . .	0,90	3,52	0,30	»	0,38	5,72	2,82	1,36	0,22	1,21	16,43	3,59	11,47
Loire	0,88	9,72	0,35	0,01	0,64	10,35	4,85	2,31	0,09	1,83	31,02	6,30	22,72
Auvergne-Bourbonnais . .	0,10	1,09	0,54	0,84	0,63	6,99	4,33	1,40	0,08	0,97	16,97	3,30	12,48
Gard - Hérault	0,10	2,15	0,45	1,98	0,78	9,13	2,38	1,95	1,40	1,56	21,88	4,32	15,28
Tarn - Aveyron	0,41	2,00	0,58	»	0,93	7,29	1,96	2,19	0,19	1,61	17,16	6,46	13,22
Alpes	0,08	0,30	0,30	0,60	1,21	9,87	1,21	1,81	0,08	0,75	16,21	3,30	11,90
Provence	0,31	1,64	0,36	»	0,67	8,00	1,74	1,80	0,10	1,23	15,85	3,73	11,91
Autres bassins	0,40	3,16	1,98	»	0,75	12,92	6,28	2,42	0,66	2,75	31,30	7,02	22,87
Ensemble charbon	0,22	3,16	0,32	0,20	0,50	7,04	2,52	1,96	0,16	1,41	17,49	5,68	13,76
Ensemble fer	»	0,01	0,14	»	3,75	20,40	1,34	4,34	»	2,37	32,35	10,04	25,10
Autres mines	0,73	0,66	0,56	»	3,26	8,72	4,67	2,23	»	3,09	23,92	5,13	13,95

— *Parmi les 161 tués par D.I. dans le Bassin des Cévennes, 3 ont été asphyxiés au jour en 1907. Il s'est produit, dans les Cévennes, environ 6 200 dégagements instantanés de grisou ou d'acide carbonique de 1879 à 1962, dont 41 ont provoqué des accidents mortels (Documents S.C.O.D.I.).*

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Figure 5. Table 2. André Dardalhon, *Nombre de tués de 1861 à 1862 (sauf 1939 et 1940),* 1965. Number of deaths in mines and quarries in France between 1861-1962 (excluding 1939-40). Table © *Annales des mines*, all rights reserved. Publication courtesy of CGEIET.[48]

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[48] Dardalhon, "Evolution de la Sécurité dans les mines…," 53.

Figure 6. Armelle Skatulski, *Untitled (The Ruin), Absent Machine* series, 2015.

Figure 7. Armelle Skatulski, *Untitled (The Archive), Absent Machine* series, CAITM, 2016.

Figure 8. Armelle Skatulski, *Untitled*, *Interfaces* series, BRGM Unité Territoriale Après-Mine Est, 2019.

Figure 9. Armelle Skatulski, *Untitled*, *Interfaces* series, BRGM Unité Territoriale Après-Mine Est, 2019.

ACCIDENTS COLLECTIFS AYANT PROVOQUÉ   10 tués ou davantage depuis 1861 (1)

Date	Lieu	Circonstances	Nombre de tués
11-10-1861	Lalle (Gard)	Inondation de la mine par les eaux d'un ruisseau en crue.	105
17-11-1869	Bully-Grenay (Pas-de-Calais)	Incendie de boisage ayant provoqué un renversement de l'aérage.	19
24-12-1879	Roche-la-Molière (Loire)	Incendie d'une écurie souterraine.	20
11- 8-1880	Carrière de pierre de Ports (Indre-et-Loire)	Éboulement d'un coteau exploité souterrainement.	25
27-12-1880	Malafolie (Loire)	Incendie souterrain.	11
21- 6-1883	La Paperie (Maine-et-Loire)	Effondrement d'une ardoisière souterraine.	13
25-10-1885	Chancelade (Dordogne)	Effondrement d'une carrière souterraine. (Les 13 tués comprennent 8 personnes étrangères à l'exploitation.)	13
4- 2-1895	Montceau-les-Mines (Saône-et-Loire)	Inflammation par les feux d'un incendie de produits de distillation de la houille.	28
2- 6-1896	Fontanes (Gard)	Dégagement instantané d'acide carbonique.	24
28- 8-1899	Plat-de-Gier (Loire) Puits Couchoud	Rupture d'un câble d'extraction.	16
8- 3-1900	Trélys (Gard)	Dégagement instantané d'acide carbonique.	16
28-11-1900	Aniche. Fosse Fénelon	Explosion d'une dynamitière souterraine.	21
25- 1-1905	Ardoisières de Maine-et-Loire (Avrillé)	Rupture d'un câble d'extraction.	15
10- 3-1906	Courrières (Pas-de-Calais) Fosse 3	Poussières. La cause de l'inflammation est restée inconnue.	1 099
18-10-1911	Puits des Flaches (Loire)	Feu de mine et inflammation du grisou.	27
3- 9-1912	La Clarence. Nord	Grisou-poussières. Inflammation sur tir ou par lampe ouverte ou par explosion de détonateurs ou explosifs à l'air libre.	79
23-11-1912	Saint-Martin (Gard)	Dégagement instantané d'acide carbonique.	24
14- 1-1913	Cransac (Aveyron)	Feu de mine et inflammation du grisou.	12
16- 4-1917	Nœux (Pas-de-Calais)	Grisou-poussières. Lampe volontairement ouverte.	42
16- 6-1917	Graissessac (Hérault)	Inflammation de grisou provoquée par l'ouverture volontaire d'une lampe de sûreté.	18
26- 9-1917	Béthune (Pas-de-Calais)	Asphyxie par gaz asphyxiants amenés par un bombardement.	14
14- 3-1919	Mine de potasse Fernand (Haut-Rhin)	Explosion d'un dépôt souterrain d'explosifs.	13
25- 3-1919	Mine de potasse Théodore (Haut-Rhin)	Flambée de grisou. Lampe à feu nu.	11
2- 1-1919	Sarre-et-Moselle. Puits Waldemar-Muller	Grisou-poussières. Lampe de sûreté défectueuse.	36
3- 1-1919	Mine de fer de Rochonvillers (Moselle)	Coup de charge. Effondrement généralisé.	24

(1) Pour les inflammations de grisou ou de poussières survenues avant 1900, prière de se reporter aux *Annales des Mines*, n° XI, 1962. Pages 743-744.

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Figure 10. Table 3 a. André Dardalhon, *Accidents collectifs ayant provoqué 10 tués ou d'avantage depuis 1861 (1),* 1965. Collective mining accidents leading to the death of 10 or more workers, 1861-1959, France.[49] Table © *Annales des mines*, all rights reserved. Published courtesy of CGEIET.

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[49] Dardalhon, "Evolution de la Sécurité dans les mines…," 64.

ACCIDENTS COLLECTIFS *(Suite)*

Date	Lieu	Circonstances	Nombre de tués
19- 1-1920	Anzin (Pas-de-Calais)	Rupture de l'arbre du treuil servant de machine provisoire d'extraction et chute de la cage.	17
4- 4-1921	Trélys (Gard)	Coup de grisou. Lampe de sûreté probablement ouverte.	16
26- 3-1925	Sarre-et-Moselle. Puits Reumaux	Manœuvre au personnel au cours d'une opération de réglage de câble comportant le déclavetage du tambour. Chute de la cage.	55
30- 6-1928	Roche-la-Molière (Loire). Puits Combes	Incendie de boisage suivi d'un renversement de l'aérage.	48
16- 9-1929	Petite-Rosselle (Moselle)	Inflammation de grisou provoquée par la flamme d'un chalumeau dans un puits. 23 tués au jour.	23
9-10-1934	Mine de Pyrite de Sain-Bel (Rhône)	Incendie souterrain.	31
22-10-1936	Carrière à ciel ouvert des Aucrais à Cauvicourt (Calvados)	Explosion de cartouches à oxygène liquide provoquée par la chute de l'une d'elles au moment où on la sortait du bac de trempage.	20
7-10-1939	Mines de la Loire. Puits Loire I.	Grisou-poussières. La cause de l'inflammation a été attribuée à l'ouverture d'un coffret d'appareillage électrique sous tension.	38
23- 7-1940	Mine de potasse Rodolphe (Haut-Rhin)	Coup de mur.	25
21- 1-1942	La Chana (Loire)	Grisou-poussières. Probablement imprudence d'un ouvrier qui a allumé un briquet ou une allumette.	65
2- 3-1943	Béthune (Pas-de-Calais). Fosse 9	Inflammation de grisou sur tir.	16
2- 4-1943	Blanzy (Saône-et-Loire)	Feu de mine.	10
28- 3-1946	Oignies (H.B.N.P.C.)	Coup de grisou. Tamis d'une lampe de sûreté porté au rouge.	13
10- 1-1948	Petite-Rosselle. Puits Vuillemin	Grisou-poussières. Sur tir.	23
19- 4-1948	Courrières (H.B.N.P.C.)	Coup de poussières provoqué par l'éclatement d'une colonne d'air comprimé dans un puits. 5 tués au jour, 11 au fond et nombreux blessés.	16
26- 1-1950	Saint-Éloy (Houillères du Bassin d'Auvergne)	Coup de grisou sur tir.	13
7- 2-1951	Bruay-Siège 5 (H.B.N.P.C.)	Coup de grisou sur tir.	12
20- 5-1952	Siège du Parc (Houillères du Bassin d'Auvergne)	Dégagement instantané d'acide carbonique.	12
20- 6-1954	La Clarence (H.B.N.P.C.)	Grisou-poussières. Inflammation provoquée par une chasse d'air comprimé.	10
18- 1-1955	Puits Monterrad (H. du Bassin de la Loire)	Grisou-poussières. Sur tir. .	10
16- 3-1957	Lens-Liévin (H.B.N.P.C.)	Coup de poussières. Sur tir.	10
16- 1-1958	Puits Plichon (Houillères du Bassin de Blanzy)	Grisou-poussières. Sur tir à l'air comprimé.	20
11- 2-1958	Hénin-Liétard (H.B.N.P.C.)	Rupture de l'arbre du treuil d'une bure et chute de la cage.	11
21-11-1958	Puits Vuillemin (Houillères de Lorraine)	Coup de grisou sur tir.	12
25- 5-1959	Puits Saint-Charles (Houillères de Lorraine)	Grisou consécutif à un feu de mine.	26

Figure 11. André Dardalhon, *Accidents collectifs (suite),* 1965. [50] Table © *Annales des mines*, all rights reserved. Reproduced by courtesy of CGEIET.

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[50] Dardalhon, "Evolution de la Sécurité dans les mines…," 65. The statistics in this table fail to include the collective accident of Sainte-Fontaine on 29 May 1959, which led to the death of 26 workers due to a methane explosion.

Chapter 1

Re-presenting the Accident:

the Aftermath and the Simulation

1. The document at work: the archival-industrial complex, accumulation, and the biopolitics of extraction

> **archive:** early 17th century, 'place where records are kept,' from French *archives* (plural), from Latin *archiva*, *archia*, from Greek *arkheia* 'public records', from *arkhē* 'government.'
>
> **document:** late Middle English: from Old French, derived from Latin *documentum* 'lesson, proof' (in medieval Latin 'written instruction, official paper'), from *docere* 'to teach.'
>
> *Oxford English Dictionary.*

One of the modalities of the exercise of (industrial) power is the deployment of documentary or archival forms which are techniques enacting the power to record, classify, and re-present, or to image speculatively. The field of production of a company may be documented in its actuality or represented via speculative forms such as simulation models or re-enactments. To record events of productivity or instances of the latter's (accidental) disruption, to survey an accident's aftermath and conduct forensic inquiries, or to invent new visualisation methods during simulation experiments designed to test risk-fraught work conditions … Such practices, which may be qualified of *archival-industrial*, come to form an ensemble or network that is coextensive with the field of extraction-production. There is an *industrial modality of practices of archiving* and several *archival lives* of the document, which may be referred to broadly as industrial and post-industrial. There is therefore the life of the document *at work* or *set to work industrially* in the administrative machinery of the archival-industrial or archival-extractive complex of the corporation, and the life of the document once deposited in the order of *domiciliation* or *consignation*[51] of the corporate archive become public.

They correspond to two qualitatively differentiated forms of operativity and use-value of the document. While the former can be described as the document's operativity within an industrial apparatus, the latter may be perceived as endowed with a dormant or latent form of agency or operativity, requiring a form of *activation* (through the activity of the reader, the archivist, or the artist for instance). These multiple lives of the document ought to not be conceived of as distinct but to be understood *relationally* and *genealogically*[52] – as one is the historical pre-condition of the future existence of the other. Artistic methodologies aimed at reconfiguring archival consignation may therefore be understood as engaging with this genealogical link, not simply by reproducing archival

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[51] Domiciliation and consignation are terms used by Jacques Derrida in *Archive Fever: a Freudian Impression*, trans. Eric Prenowitz (Chicago: University of Chicago Press, 1996) 2-3.
[52] Genealogy as a methodology of historical analysis will be discussed in Chapter 3 with reference to the work of Michel Foucault.

sources, but by problematising how the material economy of the public archive stems from that of the corporate archive and more widely, that of the regime of extraction.

To speak of an *industrial modality of archiving practices* is to understand such practices as being part and parcel of the field of action of a company, firm, or corporation (and of industrial power more broadly). In the context of a capitalist mode of production, it is to problematise the *(industrial) accumulation of documents* in relation to the *accumulative and extractive logics of capital*.[53] Hence to consider the accumulation of documents in relation to the *effects* of extraction-production. *Productive power* would include the power to produce documents and the archival-industrial accumulation of documents would be linked to the continuous, diffuse,[54] dimensions and expansive or territorialising propensity of economic power. A technology such as photography may be understood as inscribed in a heterogeneity of recording or archiving technologies allowing for different regimes of capture and variegated levels of representational depth, detail, and scale.

Furthermore, this research problematises the work accident and its documentation in relation to biopolitics and highlights how the accident, the production of documents, and a biopolitical governance of extraction-production aiming at the containment of the accidental are related (Chapter 3). As noted by Eduardo Mendieta when analysing Michel Foucault's exposition of biopower, biopolitics may be defined as "a new modality of producing, circulating, and enacting power that subjects and governs individuals" through disciplines aimed at the body and regulatory mechanisms[55] that "target political agents as members of a living species."[56] Biopower ought to be understood as a form of power generated through biopolitical *dispositifs* (or apparatuses) such as those relating to sexuality, race, productivity, health, mortality, or fertility[57] which are aimed at producing a form of homeostasis or equilibrium.[58] Biopolitics constitute "the attempt, starting from the eighteenth century, to rationalize the problems posed to governmental practice by phenomena characteristic of living beings forming a population [...]"[59] As underlined by Mendieta, biopolitics make

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[53] For a discussion of the link between the emergence of photography, capitalism, and the formation of corporate archives, see: Kevin Coleman and Daniel James, "Introduction: Capitalism and the Camera." In *Capitalism and the Camera: Essays on Photography and Extraction* (London; New York: Verso, 2021) 9.

[54] The notion of diffusion as an operating modality of power that was introduced by Michel Foucault in *Surveiller et punir: naissance de la prison* (1975) is discussed in chapters 3 and 4.

[55] Disciplines aimed at the body in an individualising fashion are characteristic of disciplinary power and should be distinguished from regulatory mechanisms targeting phenomena affecting the population as mass. See Michel Foucault, *Society Must Be Defended: Lectures at the Collège de France, 1975-1976,* trans. David Macey. (London: Penguin Books, 2004) 244.

[56] Eduardo Mendieta, "Biopolitics," in *The Cambridge Foucault Lexicon*, eds. Leonard Lawlor and John Nale. (Cambridge: Cambridge UP, 2014) 37.

[57] Mendieta, "Biopower," in *CFL*, 44.

[58] Foucault, *Society Must Be Defended,* 246.

[59] Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978—1979*, trans. Graham Burchell (Basingstoke and New York: Palgrave Macmillan, 2008) 317.

life and its processes "an explicit object of political-economic calculation,"[60] while marking a historical shift away from a "juridico-discursive" form of power (i.e., sovereign) that is repressive, punitive and expressed through laws, to a form of productive, disciplinary, regulatory, decentred and capillary form of power.[61]

Biopower is defined by Foucault as a "regulatory" form of power and is premised upon the creation of *regulatory mechanisms* and the emergence of a new form of political technology – "the regulatory technology of life:"

> […] a technology which brings together the mass effects characteristic of a population, which tries *to control the series of random events that can occur in a living mass*, a technology which tries *to predict* the probability of those events (by modifying it if necessary), or at least to compensate their effects. (My emphasis) [62]

Such a form of power is manifest in, for instance, the emergence of a form of medicine centred on public hygiene, the medicalisation of the population, the deployment of statistical tools measuring phenomena such as infirmities, anomalies, and accidents.[63] This coincides with the introduction of rational mechanisms such as insurance, savings, safety measures, etc. The concept of a "regulatory technology of life" emphasises the centrality of the body as productive power to economic life. It also highlights how biopower distinguishes itself from a form of power governing subjects as legal entities, i.e., sovereign power, which is referred to by Foucault as the power "to take life and let live."[64] The power of the sovereign constituted a right of life or death over its subjects. And the spectacularization of death by sovereign command was an important element of the exercise of such power. Biopower by contrast is referred to as a "scientific, continuous" form of power aiming at regularization and which "consists in making live and letting die."[65] Regulatory and sovereign powers do not exclude each other but become integrated. As pointed out by Thomas Lemke this integration is not restricted to transformations in the realm of politics alone but is the result of important historical transformations such as, the increase of industrial and agricultural productions in the 18th century, and the expansion of medical and scientific knowledge.[66]

Biopower is a new form of power which is superimposed on to disciplinary power, which constitutes a seizure of the body in an individualizing mode (such as through the "disciplinary technology of labour" for instance). Biopower by contrast is concerned with bodies in their

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[60] Mendieta, "Biopower," 44.
[61] Mendieta, "Biopower," 44.
[62] Foucault, *SMBD,* 249.
[63] Foucault, *SMBD,* 244.
[64] Foucault, *SMBD,* 241.
[65] Foucault, *SMBD,* 247.
[66] Thomas Lemke, *Biopolitics: An Advanced Introduction,* (New York: New York University Press, 2011) 35.

multiplicity at the scale of masses and constitutes "a biopolitics of the human race,"[67] and tackles

phenomena that occur in a population at the level of their generality:

> The mechanisms introduced by biopolitics include forecasts, statistical estimates, and overall measures. And their purpose is not to modify any given phenomenon as such, […] but, essentially, to intervene at the level at which these general phenomena are determined, to intervene at the level of their generality.[68]

The fact that biopower treats "phenomena" as generalities is also manifest in the "gradual

disqualification of death" in favour of the statistical notion of mortality.[69]

Foucault linked the emergence of *cumulative* documentary techniques to the rise of

disciplinary power as a power of writing and archiving[70] resulting in the constitution of the individual

as analysable, describable object through the production of codes, types, and classificatory grids.

These led to the inscription of subjects in diagrammatic ensembles and the production of a

generalised field of visibility implementing a form of hierarchical surveillance.[71] In this sense, the term

production may be understood to encompass the production of material commodities *as well as* the

production of representational and diagrammatic forms – from the schema to the photograph –

whereby *industrial* documentation is constituted through practices operating from the level of detail

to wider relational formations or arrangements. While photography may be referred to as a

representational form, the research will emphasize its *relational* dimension, that is, as a practice

enabling the formation of relations or inscribed in an economy of (power) relations in a wider

ensemble referred to as a *dispositif* [72] with respect to a Foucauldian analysis of power (Chapter 3). In

this sense, photography may be understood as endowed with what may be referred to as a logistical

dimension (see Chapter 4). The research aims to emphasize the material economy that underlies the

field of visibility resulting from the industrial archival practices of the corporation – hence moving

beyond a restrictive understanding of the photograph as a *visual* or *representational* form to

emphasize its material and relational dimension and its ability to enact a certain power to, not only,

record, classify, hierarchise, but also to govern – such as via pedagogies aimed at training workers in

risk and safety, informational campaigns, or disciplinary or legal procedures. This research is not

restricted to an interpretation of photography as disciplinary technique (i.e., as enacting a disciplinary

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[67] Foucault, *SMBD,* 243.

[68] Foucault, *SMBD,* 246.

[69] Foucault, *SMBD,* 247.

[70] Michel Foucault, *Surveiller et punir: Naissance de la prison* (Paris: Éditions Gallimard, 1975) 221-23.

[71] Foucault, *Surveiller et punir*, 201.

[72] *Dispositif is s*ometimes referred to as "dispositive" in the British English spelling by some authors. For a discussion of the critical significance of the concept of *dispositif* as introduced by Michel Foucault see: Rabinow, Paul and Nikolas Rose. "Foucault Today," in *The Essential Foucault: Selections from the Essential Works of Foucault 1954–1984,* ed. Paul Rabinow and J. Faubion (New York: New Press, 2003) xv.

form of power),[73] but rather acknowledges such function as one of its modalities of operativity. It proposes to problematise photographic practice in relation to a biopolitical *governing* of a workforce by a corporation, as embedded in in a field of instrumentality co-extensive to extractive practices of industrial extraction-production.

In its Greek etymology the term archive, as was pointed out by Jacques Derrida in *Archive Fever: A Freudian Impression* (1995), derives from *arkheion* which referred to the domicile or residence of superior magistrates, *archons*, and in which official documents were kept. *Archons* were entrusted with the authority and power to keep, access, and interpret documents and to make the law.[74] This dimension of the archive may be revisited through the notion of the corporate archive as instrumental to the private government or governance of workers by the corporation and as inscribed in the larger ensemble of a *dispositif*. [75] However, this research also aims at highlighting how the photograph may evade such economy or regime when inserted in new formations (such as in the context of an artistic practice) in which its encounter with new readers/interpreters leads to the possibility of affective dynamics that exceed the normative effects associated with documents and the evidentiary semiosis in which they are inscribed (see Chapters 2 and 4).

As mentioned previously the work accident is represented through a plurality of forms: photographic documents, schematic representations, testimonials and other forms of verbal accounts such as correspondences or reports (where visual representations may be used in conjunction with schemas and text). The (corporate) archive of extraction comprises different types of photographic documentation and related visual technologies which include:

- photographs documenting the aftermath of work accidents (mainly in the form of topographical studies of incidents' sites used in accident analyses files or reports),
- re-enactment photographs (used in analyses files),
- photographic documents linked to simulation tests (in forensic and legal inquiries),
- photographs recording physical damage to infrastructures or geology presenting risks,

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[73] For a discussion of the inscription of photography within a disciplinary apparatus see: John Tagg, *The Burden of Representation: Essays on Photographies and Histories* (Amherst: University of Massachusetts Press, 1988). Elsewhere John Tagg considers "the systems of discursive constraint or 'technologies of power' that constitute the status of the document and record and frame the evidentiary value of the image in the varied institutions of what Foucault called 'disciplinary knowledge.'" In *The disciplinary frame: photographic truths and the capture of meaning* (Minneapolis: University of Minnesota Press, 2009) xxx-xxi.

[74] Derrida, *Archive Fever,* 2.

[75] While discussions of the archive often refer to Foucault's concept of the archive developed in *The Archaeology of Knowledge* (1969), this research proposes to problematise the archive through the notion of *dispositif* developed by Foucault from *Discipline and Punish: The Birth of the Prison* (1975) onwards.

- photographs appearing in advertisements or marketing material,
- other types of visual technologies used in an industrial context (videography; micrography; thermography; holography; radiography).

The research will offer an interpretation of the material heterogeneity of representational forms that are deployed by a corporation in response to the disruptive force of the accident in relation to the concepts of multiplicity and diffusion as modalities of (industrial) power's operativity (Chapter 3).

2 – Re-presenting the accident (I): the aftermath
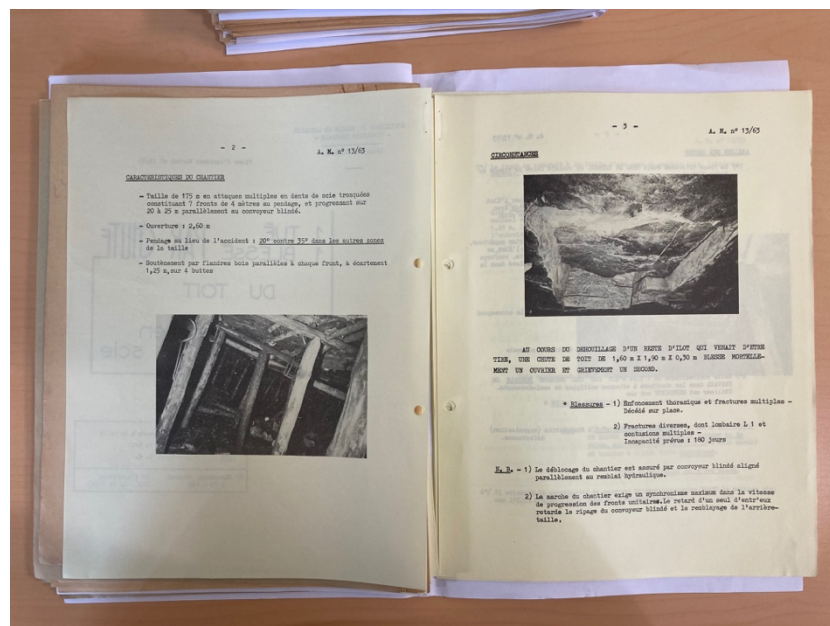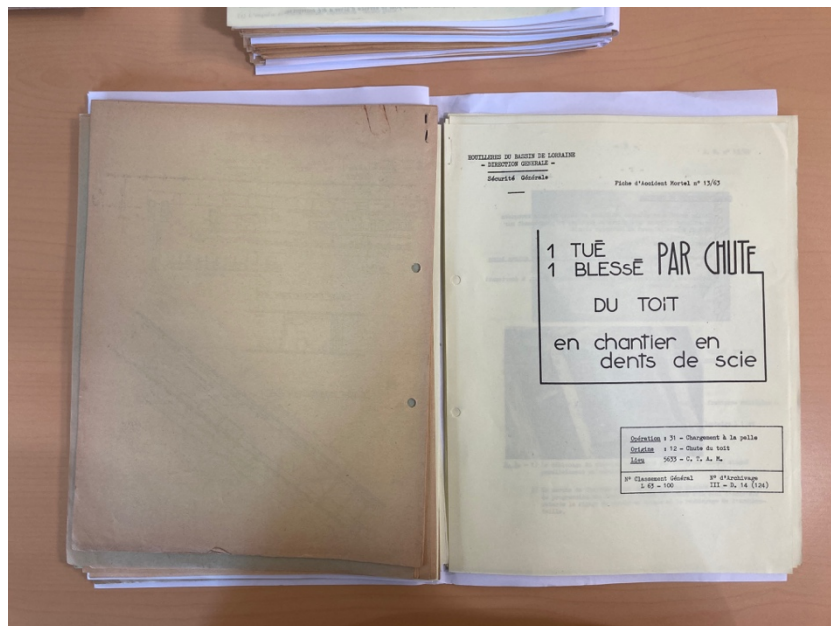
Figures 12 and 13. Armelle Skatulski, "Fiche d'Accident Mortel 13/63 [title page, pages 2 and 4]," c. 1963. Documents originally © HBL. Public domain. Reproduced courtesy of CAITM.

Figures 14, 15, 16 and 17. Author and photographer unknown, "Fiche d'Accident Mortel 13/63 [various pages]," c. 1963. Documents originally © HBL. Public domain. Reproduced courtesy of CAITM.

HOUILLERES DU BASSIN DE LORRAINE
  – DIRECTION GENERALE –

  Sécurité Générale

                                    Fiche d'Accident Mortel n° 13/63

1 TUĒ
1 BLESSĒ PAR CHUTE

DU TOIT

en chantier en
dents de scie

Opération : 31 – Chargement à la pelle
Origine   : 12 – Chute du toit
Lieu   5633 – C. T. A. M.

N° Classement Général   N° d'Archivage
    L 63 – 100   III – D. 14 (124)

Figure 18. Author unknown, "[Title page of the analysis file of fatal accident 13/63]," c. 1963.
Document originally © HBL. Public domain. Reproduced courtesy of CAITM.

2.a. *La fiche d'accident*: Accident "L 63 – 100; III – D. 14 (124)" (1963)[76]

      I open the "Fiche d'accident" (accident analysis file) after retrieving it from a larger compilation held together in a dossier inventoried as "Etudes des accidents: 1960-1970" (studies of accidents). The compilation comprises accident analysis files grouped by year, and which have been selected for their exemplary or representative value, as "*accidents typiques ou remarquables*" (typical or remarkable accidents). The compilation is divided in sections relative to "*accidents mortels*" (fatal accidents) and "*accidents très graves*" (very serious accidents). "Fiche 13/63" is fourteen pages long. My eyes scan its title page. In this first encounter, imprinted words and images appear indistinguishable from the page, their material support. Yet their being summoned together and impressed upon the page is the result of a specific form of labour: that of accounting, analysing, and consigning specific types of events – work accidents – in the administrative and archival logics of the corporation. While I am not yet aware of a layo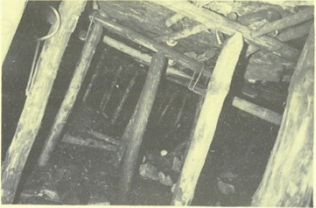ut, an organizing principle, or visual design drawn out of intent, I look for the date of the accident recorded here and its kind. I am drawn to this temporal anchor and curious about the administrative or classificatory protocols that have been devised for this kind of incident. My mind is focused to the extent that I am motivated to learn about the circumstances of work-related injuries and deaths, their inscription within the economic, extractive, and administrative practices of an industry, and the politics of their normalisation. However, I also let myself be drawn to this document's very objecthood, its material dimension, and a certain ordered heterogeneity of forms that characterise it (textual, graphic, photographic, and diagrammatic). Furthermore, this encounter comes to fill the horizon formed by a desire to visualize a reality that was hidden from one's experience or direct apprehension, daily, repetitively, while constituting a threat.

      The words "*par chute*" (by way of a fall; through a fall) first stand out, for the clerical hand that has assembled this file has intentionally inscribed them in a much larger size than for other terms. The typographical organisation of the page speaks of a form of pedagogical intent giving shape to a visual rhetoric and, one may say, to a form of administrative aesthetic. These correspond to a certain parting of the space of the page through the distribution of textual and graphic elements, which point to the infinitesimal actions and gestures of a worker, and to the multiplicity of material means through which the corporation's power to archive operates, revealing the technological and industrial value of the page as a space of inscription and of analysis. In the infinitesimal paths through

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[76]Accident analysis file, "Fiche d'Accident Mortel 13/63," (Fatal Accident Sheet No. 13/63), by Houillères du Bassin de Lorraine (HBL), 1963, Dossier 55HBL21, *Centre des Archives Industrielles et Techniques de Moselle*, Saint-Avold, France.

which the corporation diffuses its operations, inscription conjoins the administrative skills of the worker to the wider power of extraction: where inscribing serves another form of extraction, namely that of information. I read: "*1 TUÉ, 1 BLESSÉ*." One killed, one injured. The accident file gives an account of injuries, conditions, circumstances, and causes, and it keeps count. The victims, one killed and one injured, are incorporated in the corporation's administrative accounting.

A form of analysis takes shape following a schema repeated across all files in the compilation. As discussed in this example, files provide a survey of the characteristics of the site of extraction, an assessment of the circumstances preceding an incident, and propose a hypothetical analysis of causes. They also offer recommendations, sometimes referred to as "remedies,"[77] and formulate conclusions (see pages 10 and 11 of the report featured at the end of this section). However, "1" and "1" beyond their algebraic usage, echo their linguistic equivalent: one and one – complete, whole, indivisible. "1" evokes *one* as living being while simultaneously referring to an abstract and quantitative order. The life of the worker who perished or was seriously injured, while being anonymised and rendered abstract through the numerical marshalling of the deceased and the injured into the quantitative order of statistics, may not be fully suppressed.

To the top left-hand corner of the page, the name of the company and the specific department in which the file was compiled are inscribed in a pyramidal order: "*Houillères du Bassin de Lorraine – Direction Générale – Sécurité Générale*."[78] The incident that leaves one individual for dead and one seriously injured is dealt with in the central headquarters of general safety management ("*Sécurité Générale*"). My eyes reach the heading of the report placed at the top of the page, to the right-hand side: "*Fiche d'Accident Mortel n. 13/63*" (Fatal Accident File n. 13/63). As I read the date and sequential number of the accident, I become aware of the frightening frequency of such incidents and their succession. While the accident is referred to as the 13th of that year, it appears that not all fatal accidents have become the object of such a study, but only those identified as typical or remarkable have. While the unpredictability of work accidents comes to disrupt the regime of extraction, an administrative retrospective procedure presents the series of accidents as a chronological series - in the year 1963. The cumulative succession of fatal accidents becomes naturalised as a *temporal succession*, where the work accident conceived of as a type of *aleatory event* is presented as closer to the categories of time and chance than to that of structure, i.e., where time may be perceived as a form of abstract nature dissociated from the system of structures that govern or constitute the field of extraction-production. However, one may argue that the work accident ought to be understood as a *technological event* inscribed in what could be described as a

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[77] See Figure 22, page 51.
[78] Collieries of the Lorraine Basin – Executive Management – General Safety.

technological form of time, understood as the artificial, temporal regime established through and structurally bound to the workings of extractive, productive logics, and processes.

Files relative to fatal accidents have been printed on yellow paper, in the form of a publication which was probably intended for internal use in the company. They can be distinguished from other files, on pink paper,[79] which are relative to non-fatal accidents leading to serious injuries. These analyses do not seem to be part of forensic reports assembled in the direct aftermath of an accident's occurrence. They are analyses that form the basis for information or public relations campaigns aimed at the corporation's workforce. They appear to be drafted by engineers and to be communicated monthly among a certain echelon of engineers. Accidents constitute a rare type of event for which the role of state engineer is not limited to surveillance but takes the form of a direct intervention.[80] The documents constitute a reflexive moment in the administrative procedures of the company and are linked to preventive and internal pedagogical practices. The corpus composed by these files constitutes a form of typology. Another kind of record however, *le procès-verbal* (in French law, a written statement of facts in support of a charge), is undertaken by the *garde-mine* (mine guard) for each work accident. The *procès-verbal* ensured that all mining accidents were accounted for and described in detail therefore constituting an archive of the quotidian risks experienced by different categories of workers.[81] This procedure is linked to a law which in 1810 instituted that specific measures should be followed by mining companies in the event of an accident,[82] while the automaticity of the juridical character of work accidents was established in 1898.[83] The practice of reporting and analysing work accidents in the context of extractive industries such as coal mining is inscribed in a long and complex history of workers' struggles, trade unions' activism, and parliamentary actions that led to the gradual creation of new laws and codes of practice.[84]

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[79] See Figures 23 and 24, pages 52 and 53 respectively.

[80] Jean-Philippe Passaqui, "Connaître, comprendre et combattre les risques dans les mines de combustibles minéraux," *Le Mouvement Social*, vol. 249, no. 4 (2014) 117-118.

[81] Passaqui, "Connaître, comprendre et combattre les risques," 119.

[82] The 21 April 1810 law, which instituted "la police des mines" (the mining police), contains instructions on the measures that a mining company should take in the event of an accident, on accounting for accidents statistically, as well as on sanctions to be inflicted in the case of the lack or absence of information. Mining administrations are required to indicate whether an accident has led to the death of a worker ("s' il y a mort d'homme") or if a worker is incapacitated for more than 20 days. Reports should also be made about accidents susceptible of having an impact on overground structures such as buildings or about those accidents that would impact the energy market, such as large-scale mining disasters. See Passaqui, p.117.

[83] The 9 April 1898 French law also instituted that every work accident be the object of a forfaitary compensation, which means that a work accident victim lost the right to prosecute a mining company on a penal basis, while gaining the right to be financially compensated. The law is a testament to the growing power of insurance companies since the 19th century. See: Véronique Daubas-Letourneux, "Accidents du travail: des blessés et des morts invisibles," *Mouvements* 58.2 (2009): 31.

[84] For an overview of rights gained by coal miners in France in the twentieth century see for instance: Cooper-Richet, *Le peuple de la nuit,* 252-301. Remarkable laws are for instance: the 29 June 1905 law limiting the length

Page two of file 13/63 contains the description of the work environment accompanied by a first photograph: "*Caractéristiques du chantier*" (characteristics of the mining site). This section is structured as a list that rigorously describes the topography of the mined terrain: "*taille de 175m en attaques multiples en dents de scie tronquées*"; "*ouverture*"; "*pendage*"; "*soutènement par flandres;*" … ("cut of 175m in multiple truncated sawtooth attacks"; "opening"; "dip"; "wooden support" or "pit props;" …). The technical description of the topography and of the work environment become more and more precise as the report progresses. The file ends with schematic drawings[85] which map the broader site of extraction and others that give a more localised representation of the site of the accident.[86]

The first photograph included in the file seems at first to operate on a strictly denotative level, as if merely pointing to or doubling the reality that it records. While the photographic document is summoned for its evidentiary value, as an indexical trace[87] or a physical emanation of the reality placed in front of the camera,[88] here the photograph seems to also be summoned for its holistic dimension, as giving a view of the accident's immediate topography *at a glance,* while recording aspects of that environment that have not been described discursively. While a photograph may seem to offer such a view of the recorded scene, it only does so within the bounds of the frame (as only a section of the field of extraction may be recorded at a time, while its wider ecosystem may not – see Chapter 4). The photograph may be understood to replicate a witness's viewpoint if standing at a certain point in space. However, both the photograph and the textual list and descriptions necessitate a form of technical knowledge in order to be fully deciphered or understood, i.e., they necessitate the recourse to a body of knowledge that can only be acquired through membership to a social group (here the mining workforce) or through learned acquaintance with technical practices (through specialist training). Furthermore, one cannot fail to notice that the photograph stands in

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of a working day in mines to eight hours; and the 14 June 1946 law instituting the "statut du mineur" (the miner's status) defining a special status for the mining workforce as guaranteed special rights and its affiliation to a social security system specific to the mining industry. Such rights are now protected by the Agence Nationale pour la Garantie des Droits des Mineurs (ANGDM), the National Agency for the Guarantee of Miners' Rights, created in 2004.

[85] See Figure 20, page 49.

[86] See also Chapter 4 for a discussion of such schematic drawings.

[87] The photograph is often discussed as a type of indexical or deictic sign (a sign that points to the object that it refers to) "of the order of the trace," that is, defined by a physical, material connection to its object. Doane, Mary Ann. "Indexicality: trace and sign: Introduction." *differences* 18, no. 1 (2007): 2.

[88] Roland Barthes for instance referred to the photograph as an emanation of the referent: "the noeme 'that-has-been' was possible only on the day when a scientific circumstance (the discovery that silver halogens were sensitive to light) made it possible to recover and print directly the luminous rays emitted by a variously lighted object. The photograph is literally an emanation of the referent." See Barthes, Roland. *Camera lucida: Reflections on photography*, trans. Richard Howard. London: Vintage, 1993, p. 80.

strong visual contrast to textual elements: one may say that it opens the report page up to the topography of the accident *virtually*.

Closer observation leads me to notice visual qualities that I identify as characteristic of forensic photographs (such as foreground overexposure due to a frontal use of flash, and a certain degree of aesthetic indeterminacy in composition, or a form of composition principally determined by functionality, that relative to the operation of recording a scene with regards to the functional operations of an environment). I then become more drawn to various aspects of the topography of the mining gallery, such as the ground slope, and the wooden structures that sustain the gallery roof angled at 20 degrees. The wooden frames (or pit props) appear very rudimentary, especially at the points of juncture between their constitutive elements. While industrially manufactured and mechanised steel props were introduced at the end of the 1950s,[89] their usage did not become generalized until the 1970s. Hence, a large part of the architecture of this work environment was built progressively by the workers themselves on that site. One may say that the mine, in this instance and at this point in history, constitutes a form of lean machine, in that its precarious structures are not factory made but built by workers inch by inch as they progress in the depths of the earth. The miner therefore not only undertakes the labour of extracting coal, but also that of building the mine's architecture.[90] I pause. I may animate this still image with this thought in mind. One may say, in a reverse gesture to the method set to work by Roland Barthes in "*Le troisième sens*" (1970)[91] where cinematic fiction is stilled to highlight the resistance of certain detail to meaning and to unravel the structural fiction of cinematic time. In a reverse imaginative gesture one may animate the archival photograph speculatively to unravel the fiction of its temporal stillness,[92] while retaining the notion of a third or obtuse meaning that is supplemental to or exceeds the original function of an image: "[...] the third [meaning], the one 'too many', the supplement that my intellection cannot succeed in absorbing, at once persistent and fleeting, smooth and elusive, I propose to call it the obtuse

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[89] Jean-Marie Minot, "La tête de taille: le soutènement marchant," (At the coal face: the mechanical pit prop) transcript of a documentary part of the series *Les coulisses de l'exploit* broadcast by L'Office de Radiodiffusion Télévision Française (ORTF), the French Radio and Television Office, 17 April 1968. Accessible at the Institut National de l'Audiovisuel (INA) at: https://fresques.ina.fr/memoires-de-mines/fiche-media/Mineur00380/la-tete-de-taille-le-soutenement-marchant.html.

[90] While it may be argued that this is necessitated by the mining environment which is inherently variable, it raises the question of wage theft. Indeed, the miner should gain a wage for building the underground (non)factory, and a wage for extracting coal. But the impermanence of mining architectures works in favour of the corporation.

[91] Roland Barthes, "Le troisième sens: Notes de recherche sur quelques photogrammes de S. M. Eisenstein." *Cahiers du cinéma*, 222, 1970. This essay will be discussed in relation to affect in Chapter 2.

[92] Chapter 4 will offer an infrastructuralist reading of the photograph which problematises the association of the photograph with the category of time (as an image of a stilled moment in time) to emphasize the photograph's infrastructural dimension in the political anatomy of extraction.

meaning."[93] The supplemental dynamic triggered by the reading of details in the photograph and which may exceed a semiotic analysis of such image will be discussed in relation to a Derridean reading of Barthes' concept of punctum via the notion of the supplement and in relation to a dynamic of affect-values in Chapter 2. The supplement as linked to the photograph's material agency and capacity to exist in a new economy of objects and subjects will be discussed in Chapter 4.

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[93] Roland Barthes, "The Third Meaning: Research notes on some Eisenstein stills," in *Image Music Text*, trans. Stephen Heath (London: Fontana Press, 1977) 54.
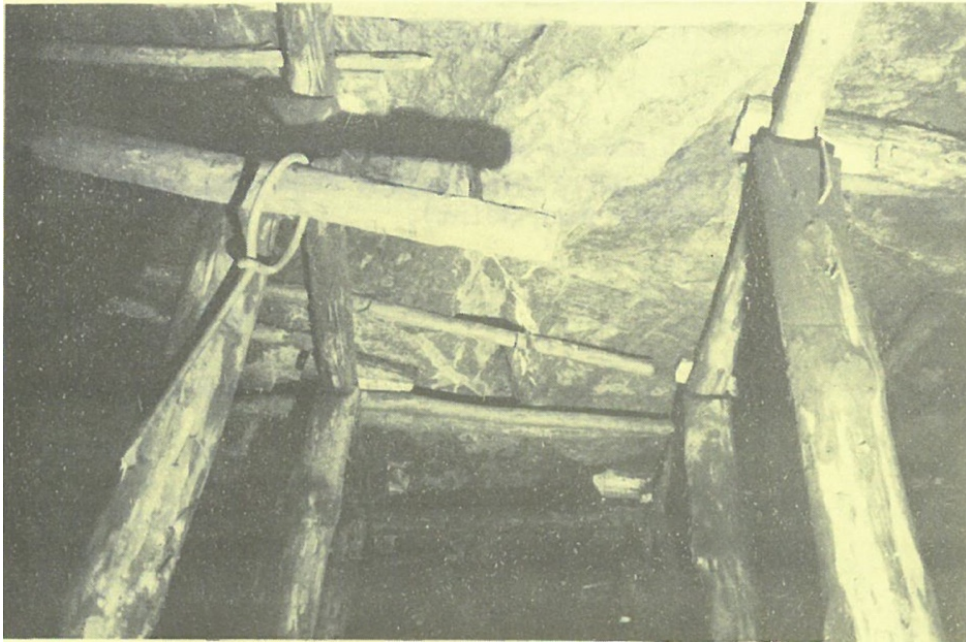
Figure 19. Photographer unknown, "Untitled [Photograph 3, fatal accident 13/63]," c. 1963.
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.
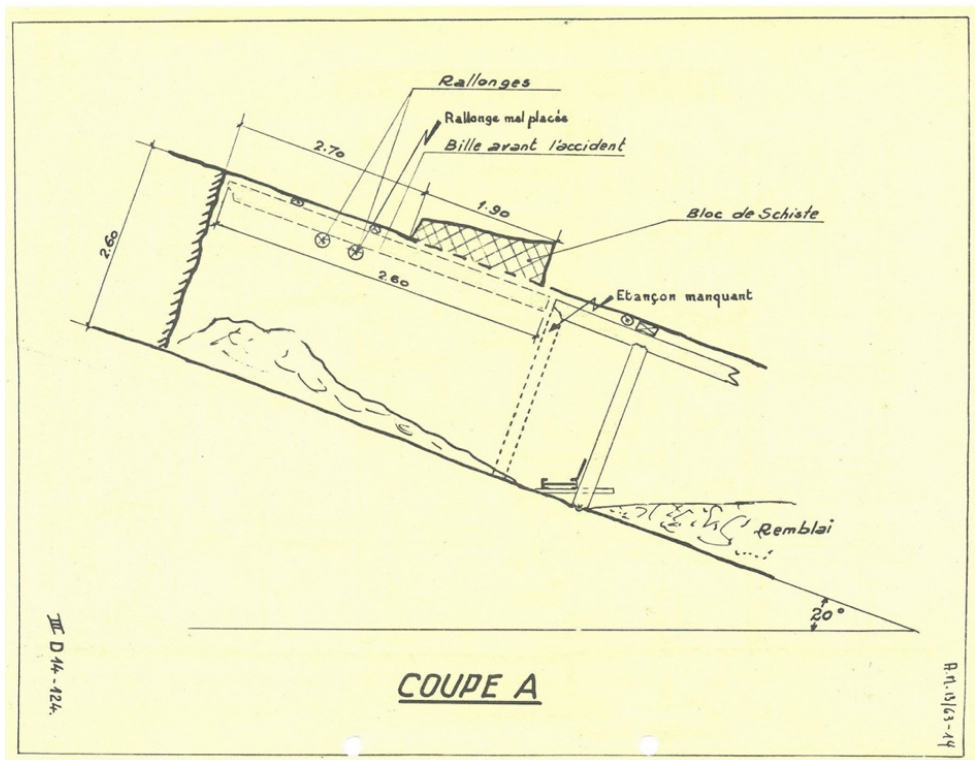
Figure 20. Author unknown, "Coupe A [Side view A, fatal accident 13/63]," c. 1963.
Diagram originally © HBL. Public domain. Reproduced courtesy of CAITM.

CONCLUSIONS

CET ACCIDENT COLLECTIF ET MORTEL EVITABLE RESULTE D'UNE SERIE IMPRESSIONNANTE DE 3 MAUVAISES CONDITIONS ET DE 4 IMPRUDENCES COMMISES CERTAINEMENT DANS LE DESIR D'ALLER VITE.

TALLEYRAND, orfèvre en son genre, disait

doucement, je suis pressé

..... car, la moralité à tirer de cet accident en plus de l'ASPECT HUMAIN est simple :

▶ le déhouillage n'a pas été terminé

▶ le ripage n'a pas été fait comme prévu

▶ le chantier a été bloqué pendant un certain temps

Figure 21. Author unknown, "[Page 10, fatal accident 13/63]," c. 1963.[94]
Document originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[94] "CONCLUSIONS: THIS AVOIDABLE COLLECTIVE AND FATAL ACCIDENT RESULTS FROM AN IMPRESSIVE SERIES OF 3 BAD CONDITIONS AND 4 RECKLESSNESS COMMITTED CERTAINLY IN THE DESIRE TO GO FAST. Talleyrand, goldsmith in his kind, said: slowly, I am in a hurry… for, the morality to be drawn from this accident in addition to THE HUMAN ASPECT is simple: the mining of coal has not been completed; the ripping was not done as expected; the work site was blocked for some time." (My translation)

- 11 -   A. M. n° 13/63

Remède

Le Siège met à l'essai une méthode de boisage provisoire des zones d'îlots permettant de soutenir le toit découvert au fur et à mesure de l'abattage de cet îlot.

Une fois de plus...

NE COMPTEZ PAS SUR LA CHANCE...

Figure 22. Author unknown, "Fatal accident 13/23 [excerpt from page 11]," c. 1963. [95]
Document originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[95] "Remedy: Headquarters are testing a method of temporary propping of areas of blocks to support the open roof as a block is felled. Once again … DON'T COUNT ON LUCK …" (My translation)

! Opération :   69 - Roulage de produits
! Origine   :   54 - Véhicules isolés sur voie
!   ferrée
! Lieu   : 8000 - Voie de grande circulation

Accident très grave
Roulage
Engins sur rails

UNE   POSITION   DANGEREUSE
MENE   A   L'ACCIDENT

CARACTERISTIQUES DU LIEU

- Galerie à 2 voies de section 12 m2, derrière un sas d'aérage ne
  pouvant contenir que 25 berlines

- A 300 m de la porte du sas (2ème en venant du puits), un culbuteur
  à remblais

- La pente prévue pour les rails était de 3 ‰, mais sur les 90 premiers
  mètres à la sortie du culbuteur, la pente atteint en moyenne 11 ‰
  avec par endroit 25 ‰ (soufflage du daisne).

- A 190m du culbuteur un aiguillage

- Un réseau de tuyauteries placé en galerie à 0,40 m au-dessus du bord
  supérieur des berlines.

CIRCONSTANCES RESUMEES

Le sas de doublement du retour d'air ne permet pas de passer un
train de plus de 25 berlines.

Après avoir dételé entre la 24 et 25ème berline une rame de
30 berlines stationnée devant le culbuteur, un ouvrier accompagne ce
train pour remettre en place un barrage de traverses établi devant
l'aiguillage. En circulant sur le tampon arrière de la dernière berline,
il est surpris par les 6 berlines laissées devant le culbuteur, qui se
sont mises en mouvement et qui rattrapent la rame tirée par la locomo-
tive (voir photo).

BLESSURES

Fracture transcotyloïdienne gauche - lésion de L4 bord antéro
supérieur droit - Incapacité prévue : 180 jours.

./...

E 22 (64)

Figure 23. Author unknown, "Accident très grave 67/7: Une position dangereuse [page 1]," *Accidents typiques et remarquables*, c. 1967. (Very serious accident 67/7: A dangerous position).
Document originally © HBL. Public domain. Reproduced courtesy of CAITM.
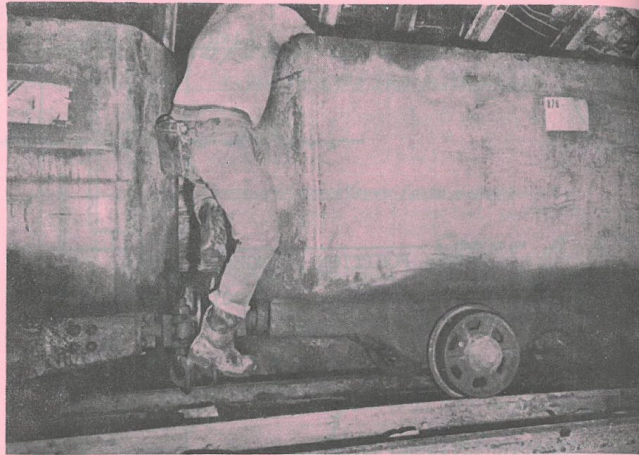
Position de la victime au moment du tamponnement
des 2 rames

ANALYSE DES CAUSES   ! Equivalent

1) La pente automotrice à la sortie du culbuteur   !
   favorisait la dérive des berlines et constituait :   ! M.C.5 - Amén
                                                          !   défectu
                                                          !
2) Avant de faire démarrer le train, un calage des   !
   6 berlines laissées devant le culbuteur s'avérait   ! I.3 - Néglig
   nécessaire mais cela n'avait pas été fait.   ! positif de s
                                                          !
3) La victime, au lieu de sauter sur la rame, aurait   !
   dû aller à pied jusqu'à l'aiguillage pour   !
   placer le barrage. Rappelons à cette occasion que   !
   la nouvelle consigne interdit de se mettre sur   ! I.3 - Néglig
   le dernier tampon (article A 49).   ! positif de s
                                                          !
4) Le fait de se mettre sur le tampon la mettait   !
   automatiquement en posture dangereuse ; c'était   !
   d'autant plus dangereux qu'il y avait au-dessus   !
   des berlines des tuyauteries qui empêchaient   ! I.6 - Se mettr
   l'ouvrier de s'installer commodément sur le tam-   ! ture dangere
   pon.   !

Figure 24. Author and photographer unknown, "Accident très grave 67/7: Une position dangereuse [page 2]," *Accidents typiques et remarquables*, c. 1967. (Very serious accident 67/7: A dangerous position). Text and photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

2.b. The aftermath photograph, affect, power and precarity
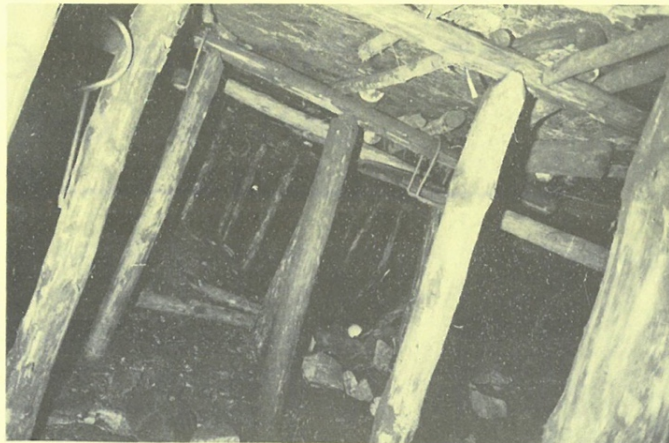
Figure 25. Author and photographer unknown, "Fatal accident 13/63 [page 2]," c. 1963.
Text and photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

The visual details gaining significance or supplemental value *for me* in the act of reading the image (photograph 1), beyond its constative use-value as evidentiary record and pedagogical tool, are: the precarity and irregularity of the wooden props used to support the roof of the gallery, the remnants of what appears to be collapsed wooden beams and fallen rock or coal, and the absence of a figure – despite scanning the image many times with one's eyes, the act of looking may only lead to the misrecognition of detail and a sense of doubt about what one sees. Among the rubble of fragmented rock, one may notice a white form reminiscent of a worker's helmet for instance, but the report's analysis never confirms or contradicts this.

Beyond the initial forensic semiosis that it enabled, the photographic document also records the extreme precarity of the work environment for future readers to acknowledge. Such precarity is further affirmed by the third photograph included in the file. Further archival research may allow one to find photographic studies that document the productive process that the accident has temporarily interrupted. The juxtaposition of photographs of work accidents with photographic records of production, further emphasises the absence of the body of the victim(s) that the accident files only refer to discursively, the impression of arrested extraction, and that of damage. While both types of images emphasize precarity and risk. Furthermore, this process may allow one to invoke the infinitesimal laborious gestures that the aftermath photograph cannot record.

[REDACTED]
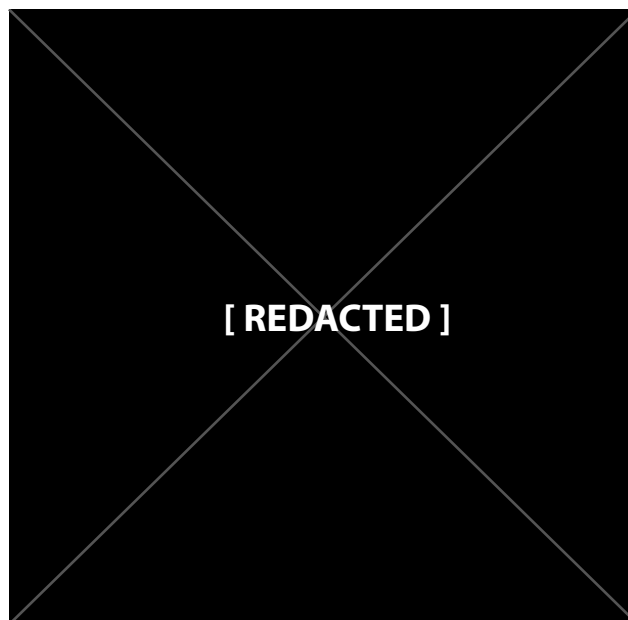
Figure 26. John L. Craven, "Mineur pelletant le charbon," c. 1951/1952. Photograph © John L. Craven Estate.[96]

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[96] The victim of Accident 13/63 was loading coal into a carrier in a similar context as shown in this photograph. However, due to the polyvalent nature of their work they may also have been involved in the installation of wooden props (see figure 27).
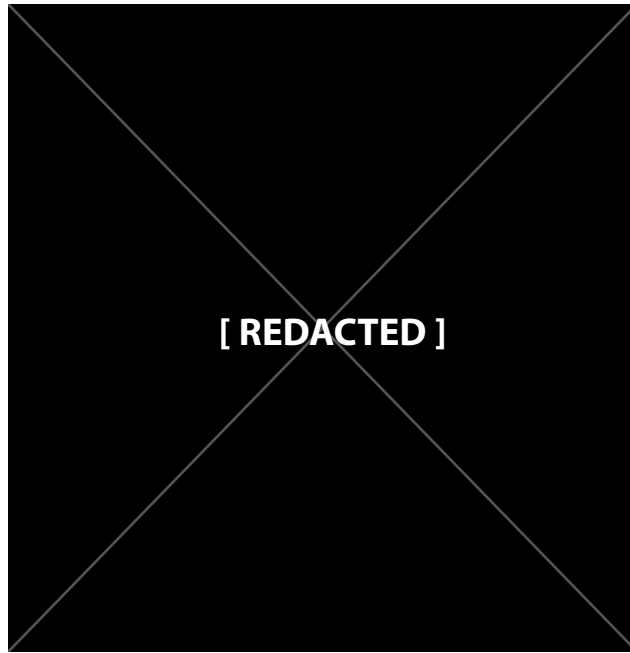
Figure 27. John L. Craven, "Mineur au boisage en taille 5 au puits Faulquemont," c. 1951/1952.
Photograph © John L. Craven Estate.
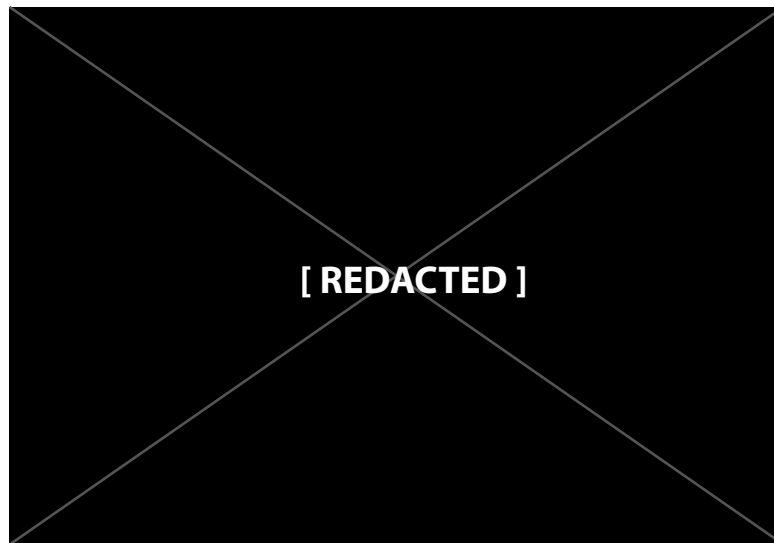
Figure 28. J. Philibert Quentin, "Mineur procédant à l'abbatage du charbon," c. 1898-1914.
Photograph © Musée des Beaux-Arts d'Arras, France.

CIRCONSTANCES

AU COURS DU DEHOUILLAGE D'UN RESTE D'ILOT QUI VENAIT D'ETRE TIRE, UNE CHUTE DE TOIT DE 1,60 m X 1,90 m X 0,30 m BLESSE MORTELLEMENT UN OUVRIER ET GRIEVEMENT UN SECOND.

* Blessures – 1) Enfoncement thoracique et fractures multiples –
Décédé sur place.

2) Fractures diverses, dont lombaire L 1 et
contusions multiples –
Incapacité prévue : 180 jours
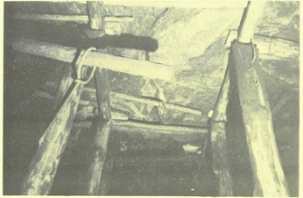
N. B. – 1) Le déblocage du chantier est assuré par convoyeur blindé aligné
parallèlement au remblai hydraulique.

2) La marche du chantier exige un synchronisme maximum dans la vitesse
de progression des fronts unitaires. Le retard d'un seul d'entr'eux
retarde le ripage du convoyeur blindé et le remblayage de l'arrière-
taille.

Figure 29. Author and photographer unknown, "Accident Mortel 13/63 [page 3]," c. 1963. Text and photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

The second photograph, inserted on page three of the file affects me immediately. Although the photographic record of the accident's aftermath is anchored within the discursive procedures of the accident analysis – its visual dimension is jarring and arresting. The photographic image seems to exceed the bounds of the page. I am drawn to it. The photograph *works* on me. I am affected; a relation is forming. In a sense, the encounter between this photograph and the reader comes to disturb the intended use-value of the analysis file (to perform a kind of forensics, pedagogy, and rationalising, befitting the logics of the corporation). This simple statement concurs with a constructivist interpretation of signifying practices, whereby signification is not simply understood as mediated by signs but produced by a subject's act of reading (and of handling the photographic document).[97] While the photograph records a topography that results from the collapse of the extractive terrain and the damaging of its structural foundations, its effects may exceed the logics of the report. One may say that beyond the issue of signification, the photograph, while constituting a record, also enacts a certain *force*, when being observed, studied, handled, reproduced – at the time of the company's operations, and later in the process of navigating the (post-industrial) archive, in the activity of research, and in artistic interventions (see Chapter 4).

This research engages with the photograph's material agency while considering its capacity to exceed the bounds of signifying or discursive practices (pertaining to a firm's forensic and other logics) through a concept of affect[98] that may help to think a dynamic between the (disjunctive) agency of the photograph and that of the reader/interpreter/artist. Affect is sometimes understood to refer to the capacity of bodies or entities to affect one other and to be affected. Such definition, indebted to a Deleuzian concept of affect, emphasises the relational dynamic at work between bodies or agencies, therefore contrasting with approaches considering affects as inner states, feelings, or emotions.[99] According to Jan Slaby and Rainer Mühlhoff, affect designates "those encounters between bodies that involve a change – either enhancement or diminishment – in their respective bodily capacities or micro-powers […] affect is inextricable from an approach to power, understood as relations of reciprocal efficaciousness between bodies."[100]

One proposes to consider affective dynamics in a manner that takes account of the regime of asymmetrical forces in which both the work accident *and* its documents(s) are inscribed. As the work

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[97] For a constructivist theory of signification see for instance: Umberto Eco, *A Theory of Semiotics* (Bloomington: Indiana University Press, 1976).
[98] See Chapter 2 for a further discussion of affective dynamics triggered by the reading of the photograph.
[99] Jan Slaby and Rainer Mühlhoff, "Affect," in *Affective Societies: Key Concepts*, edited by Jan Slaby and Christian von Scheve (London; New York: Routledge, 2019), 27.
[100] Slaby and Mühlhoff, "Affect," 27.

accident may first and foremost be understood as an event occurring in a relation of subordination[101] in the dynamics of wage labour.[102] If the photograph's material genealogy is understood to be embedded with that of the accident, it ought to be understood, not only as expressing, but also as enmeshed in such relation of subordination. And the potential affective dynamics between a photograph and an interpreter in future iterations of the document (including in artistic practice) may be thought in correlation to this genealogy of an asymmetry of forces and of a politics of (capitalist) subordination.

The photograph's flatness and silence gain increasing significance with one's growing awareness of the violence of the event that preceded its making. In the very first instant of my encounter with the second photograph, I am confronted with a bare and dark surface marked by a hollowed-out section. This corresponds to a fragment of the mining gallery roof that collapsed while the coal seam was being tackled. The damaged surface forms a negative sky in this ancient geology whose geometry bears the marks of a contention between this milieu's mineral order and the labouring forces of extraction. It constitutes a topography that is indifferent to the destruction of human life, while at the same time bearing the traces of such destruction and of what may also be understood as a form of ecological damage – as the natural milieu is treated as pure resource by the firm. While the photograph captures the damaged mineral surface, it performs its forensic role. One has died here, under the most threatening of weight. The cold, constative diagnosis of fatal injuries inserted in the report does not refer to a subject directly, but implicitly. It points to the sheer violence of the force that caused this worker's death while only designating the victim through a short enumeration of injuries – thus objectifying them in the process and performing a kind of discursive dismemberment: "*Enfoncement thoracique et fractures multiples – décédé sur place*." (Chest collapse and multiple fractures – died on the spot). As one reproduces these words, visualization imposes its force. I may try and resist the latter or choose to imagine this scene.

2.c. The work accident and wage labour subordination

One may say that the violence of the event that led to the death of this worker is also at the origin of this photograph, as the latter's production is strictly determined by the accident's

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[101] Daubas-Letourneux, *Accidents du travail,* 16.

[102] For a discussion of the dynamics of subordination introduced by wage labour as analysed by Karl Marx in a labour theory of value, see: Ernesto Screpanti, "The Subsumption and Subordination of Labour." In *Labour and Value: Rethinking Marx's Theory of Exploitation* (Cambridge, UK: Open Book Publishers, 2019), 34-40.

occurrence. The work accident calls for the practice of documenting. Disrupted extraction is relayed by the production of documents, the power to extract by that of archiving. This change in the firm's actions is not merely qualitative, it passes through the event of the work accident, and that of a worker's death. While the file presents the photographic document as a form of appendage to the analysis that it undertakes – a study of "mauvaises conditions" (bad conditions) – one may choose to emphasize the relation of the practice of photographing (and of documenting more broadly) *to* the work accident instead, whereby they ought to be considered as structurally related events, i.e., inscribed in the same regime, that of extraction.[103] Hence, the photograph is not simply a representational relay, but is the result of actions and practices deployed by the power that subjugates the worker to the possibility of injury or death at work.

Furthermore, one may say that the photographic record not only documents the immediate historicity of an accident, but ought to be thought in relation to the wider history of political and economic relations that have led to a context whereby a worker may contractually be bound to be exposed to the possibility of their own, premature, death at work. A context in which economic inequality in a firm translates as inequality in the exposure to the risk of injury or death. As pointed out by James Tyner:

> There exists a contradiction between the demands of capitalism in the pursuit of profit and the requirements to sustain and reproduce life itself. More precisely, premature death is conditioned by the unequal commodification of living labor.[104]

This contradiction reflects a hierarchy in the instrumentalization of workers, and ought to be thought in relation to the foundational inequality upon which wage-labour is premised. How does one *choose* to take the risk of own's own death at work? How can such a choice be a survival tactic for some if this situation of inequality in the exposure to risk is not related to the history of originary dispossession that has led to the institution of wage-labour subordination by capitalism? Tyner usefully recalls Karl Marx's exposition of the originary process of dispossession referred to as "primitive accumulation," which established the foundational basis of the *capital-relation* which "pre-supposes a complete separation between the workers and the ownership of the conditions for the realisation of their labour"[105] (i.e., means of subsistence and means of production). This process gave rise to the paradoxical figure of the "free worker" as "free seller of labour-power." Free workers are:

> [free] in the double sense that they are neither part of the means of production themselves, as would be the case with slaves, serfs, etc., nor do they own the means of production, as would be the case for

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[103] See Chapters 3 and 4 for a further discussion of the correlation of the photograph to the accident in the regime of extraction.

[104] James Tyner, *Dead Labor: Toward a Political Economy of Premature Death* (University of Minnesota Press, 2019), xiii.

[105] Karl Marx, *Capital: A Critique of Political Economy, vol. 1*, trans. Ben Fowkes (London: Penguin Books & New Left Review, 1976), 874.

self-employed peasant proprietors. The free workers are therefore free from, unencumbered by, any means of production of their own.[106]

This historical process operated "two transformations whereby the social means of subsistence and production are turned into capital, and the immediate producers are turned into wage-labourers."[107] And "[s]o-called primitive accumulation, therefore is nothing else than the historical process of divorcing the producer from the means of production. It appears as 'primitive' because it forms the pre-history of capital, and of the mode of production corresponding to capital."[108] This process was rendered possible through the double movement of the dissolution of feudal economic structures and that of dispossession, while nevertheless leading to the illusion of emancipation:

> […] the historical movement which changes the producers into wage-labourers appears, on the one hand, as the emancipation from serfdom and form the fetters of the guilds, and it is this aspect of the movement which alone exists for bourgeois historians. But, on the other hand, these newly freed men became sellers of themselves only after they had been robbed of all their own means of production, and all the guarantees of existence afforded by the old feudal arrangements. And this history, the history of their expropriation, is written in the annals of mankind in letters of blood and fire.

Hence in this exposition, the history of the system of wage labour is a history a forceful dispossession. The perpetuation of this system of subordination is possible through the regime of surplus-value, i.e., the expropriation of the value generated by labour from workers resulting in the fact that a wage is always inferior to the value of the goods and resources necessary for subsistence and reproductive labour.[109] Elsewhere, Marx points out that this so-called freedom is premised on the conditions that wage-labourers be proprietors of their own labour-capacity and "must always sell it for a limited amount of time,"[110] two conditions codified by law and implemented by the instrument of the contract. The contract is therefore the mechanism that encapsulates a vision of societal organization whereby the (liberal) subject is perceived as possessing "the ability to negotiate contract terms, assessing their options and making rational choices."[111] The *normalisation* of the possibility of fatal accidents at work ought to be understood as linked to the *suppression* of the wider history of originary dispossession analysed by Marx,[112] as well as to the creation of legal mechanisms that instituted the practice of contractual arrangements in the wage system. The *fatal* work accident is a type of event that most powerfully highlights the coerciveness enacted by the latter.

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[106] Marx, *Capital*, vol. 1, 874.
[107] Marx, *Capital*, vol. 1, 874.
[108] Marx, *Capital*, vol. 1, 874-875.
[109] Screpanti, "The Subsumption and Subordination of Labour," 4-5, and 12.
[110] Marx, *Capital*, vol. 1, 271.
[111] Martha A. Fineman, "The Vulnerable Subject: Anchoring Equality in the Human Condition," *Yale Journal of Law and Feminism* 20, no. 1 (2008): 10.
[112] Indeed, Marx refers to the "secret" of primitive accumulation to express the obscuring of this history from collective consciousness. See Karl Marx, "The Secret of Primitive Accumulation," in *Capital*, vol. I, 873-876.

2.d. Accident types, causes, conditions, and responsibilities

Figure 30. Artist unknown, *Sécurite générale: étude annuelle 1961* [front cover], c. 1961. Document originally ©
HBL. Public domain. Reproduced courtesy of CAITM.

The blunt report of the injuries to which the first worker succumbed and that incapacitated
the second for 180 days is followed by a description of the machinery and methods used to exploit
the coal seam. This juxtaposition highlights how the injured body, and the machinery are inscribed in
the same field of instrumental operativity, and both pertain to the latter. The cause of death for one
and of injury for the other is the collapse of what is referred to as a "roof layer" – a type of accident
occurring extremely frequently in underground mining. Further research leads me to discover that in
1961, for instance, the greatest number of fatal accidents in Lorraine collieries were caused by rock
fall ("*chute de blocs*") linked to caving roof layers and rockslides or rock collapse ("*éboulements*") at
the coal face.[113] The dossier of "Fiches d'analyses d'accident typiques et remarquables," contains

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[113] The second type of most frequently occurring fatal accidents on a mining site ("en chantier") were linked to
workers movements. See an annual report on health and safety, *Sécurité générale: étude annuelle 1961* (1961
Annual report on safety) by HBL, section 2, page 4, 1961, Dossier 55HBL21, *Centre des Archives Industrielles et
Techniques de la Moselle*, Saint-Avold, France.

numerous examples of this type of accidents, while each example presents a different combination of causal elements and conditions.

Figure 31. Table 4. HBL, *Untitled*, 1961. Statistics. Data showing the distribution of accident type per type of exploitation site and method, c. 1961. [114] Statistics originally © HBL. Public domain. Courtesy of CAITM.

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[114] Most commonly occurring categories of accidents per type of mining site ("*chantiers*") and type of mining operation: rock collapse ("*chute de blocs*"), falling objects ("*chute d'objets*"), a worker's movements ("*mouvement de l'ourvier*"), machines and tools ("*machines et outils*"), rail vehicles ("*engins de transport sur rails*"), other types of vehicles, sharp objects ("*objets piquants*"), explosives, electricity, and other causes. Note that the report refers to the cause of the accident by the terms origin or cause interchangeably, the cause or the origin being associated with a type of activity and/or the handling of specific type of machines, tools or equipment.

The classificatory procedures of the corporate archive produce typologies of accidents that emphasize a certain level of structural commonality between incidents (through the nomenclature of "*accidents typiques*"). One may say that it remains a surface level structural commonality resulting from a diagnosis of common *visible* characteristics. Typologies do not however represent nor offer an analysis of the deeper systemic relations between incidents that underly types, which appear as separate categories. Commonalities within each type are privileged over commonalities across types. The notion of type, being bound to the statistical incidence of certain events over a certain period, becomes a measure of the repetition of similar incidents over time. A type is therefore naturalised as reflecting a temporal incidence of common, visible characteristics pertaining to certain accidents, thus externalising the accident's characteristics as linked to time rather than linked to a deeper, structural form of causality or conditioning. The structural dimension of the repetitive occurrence of commonalities between types of accidents does not become an object of analysis. Furthermore, the structural agency of the extractive, productive complex is obscured while the agency or responsibility of workers (individuals or teams), is emphasised as a contributing factor to the increase of risk and the occurrence of an accident. Human error, negligence, or even a propensity of certain workers to accidents are sometimes invoked. Additional remarks in file 13/63 highlight that:

> 2o / It is curious to note that of the 5 workers of the teams concerned, 4 have a higher than normal "accident" frequency:
> - the fatally injured drill operator: 12 accidents (including the latter) in 15 years
> - the injured: 7 accidents in 11 years
> - two others respectively 4 accidents in 6 years and 3 accidents in 6 years
> - the 5th and best placed: 2 accidents in 7 years. (My translation) [115]

Or elsewhere, in the file relating to the first fatal accident of the year 1961:

> Please find attached the record of the first accident of 1961. This is the first of a long and dark series since on the day of writing this note, we already deplore 7 additional fatal accidents on site. One will, once again, be astonished at the many instances of recklessness and poor conditions that contributed to this accident. Everyone in their sector must strive to eliminate at least one bad condition per week and to fight tirelessly against the recklessness committed so often. RISKS MUST BE HUNTED.

The firm values workers that are both productive and responsible.[116] The ideology of the worker's responsibility is intrinsically linked to that of the liberal subject. The figure of the liberal subject "is indispensable to the prevailing ideologies of autonomy, self-sufficiency, and personal responsibility, through which society is conceived as constituted by self-interested individuals with the capacity to

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[115] HBL, "Fiche d'Accident Mortel 13/63," 8.
[116] "Capital values those bodies deemed both productive (e.g., in a position to generate wealth) and responsible, with responsibility conceived of as the ability to participate fully as producers and consumers in the capitalist system while, simultaneously, not incurring a net loss to the system." Tyner, *Dead Labor*, xii.

manipulate and manage their independently acquired and overlapping resources."[117] Such vision has pervaded accident analysis models and managerial discourse, while the legal responsibility of the employer have often constituted the core of important workers' claims and struggles, and trade unions negotiations.[118]

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[117] Fineman, "The Vulnerable Subject: Anchoring Equality in the Human Condition," 10.
[118] See for instance an article by trade-unionist Achille Blondeau in which the 1974 Liévin explosion that led to the death of 41 miners is recalled and health and safety is discussed in terms of class struggle and market pressures. Achille, Blondeau, "Un front commun à la profession. Réponse à l'article de M. Gardent, directeur général des Charbonnages de France," *Le Monde*, 1 November 1975. Translated in Appendix 2.

REMARQUES

1°/ Le dernier sondage à la barre à sonder avait été fait 30 minutes environ avant l'accident (les ouvriers disposaient de 2 barres sur place).

Il faut toutefois noter que l'opération de sondage du bloc décollé de la photo de la page 3, effectuée après l'accident, répondit "bon".

IL Y A LIEU DE RAPPELER AU PERSONNEL QUE LE SONDAGE NE DOIT PAS ENTRAINER UNE CONFIANCE AVEUGLE DANS LES TERRAINS, ET QU'IL NE DIS- PENSE NULLEMENT DES PRECAUTIONS ELEMENTAIRES DE PROTECTION, BOISAGE CORRECT ET A JOUR, SOUTENEMENT PROVI- SOIRE ....

2°/ Il est curieux de constater que sur les 5 ouvriers des équipes intéressées, 4 présentent une fréquence "accident" supérieure à la normale :

- le piqueur mortellement blessé : 12 accidents (y compris ce dernier) en 15 ans

- le blessé : 7 accidents en 11 ans

- deux autres respectivement 4 accidents en 6 ans et 3 accidents en 6 ans

- le 5ème et le mieux placé : 2 accidents en 7 ans.

Figure 32. Author unknown. "Accident mortel 13/63 [page 8]," c. 1963.
Document originally © HBL. Public domain. Reproduced courtesy of CAITM.

H. B. L.
DIRECTION DE L'EXPLOITATION

Merlebach, le 23 Février 1961

SECURITE GENERALE

Note d'Information F + J / 56

Le premier accident mortel du fond pour 1961

Veuillez trouver ci-joint la fiche du premier accident mortel de 1961.

C'est le premier d'une série noire importante puisqu'au jour de rédaction de cette note, on déplore déjà 7 accidents mortels au fond.

On sera, une fois de plus, étonné des nombreuses imprudences et mauvaises conditions qui ont concouru à cet accident.

Chacun, dans son secteur, doit s'attacher à supprimer au moins une mauvaise condition par semaine et à lutter sans relâche contre les imprudences commises si souvent.

CHASSE AUX RISQUES

Destinataires : Ingénieurs Fond & Jour
Chef et Sous / Chefs Porions
Porions de Sécurité

NOTA : Toutes les Notes d'Information doivent être considérées comme strictement personnelles et confidentielles et nul n'a le droit d'en faire usage en dehors du Service.

Clt. III-E 242 (1)

Figure 33. Author unknown. "Note d'information [Notice of information]," c. 1961.
Document originally © HBL. Public domain. Reproduced courtesy of CAITM.

PHOTO 1

PHOTO 2
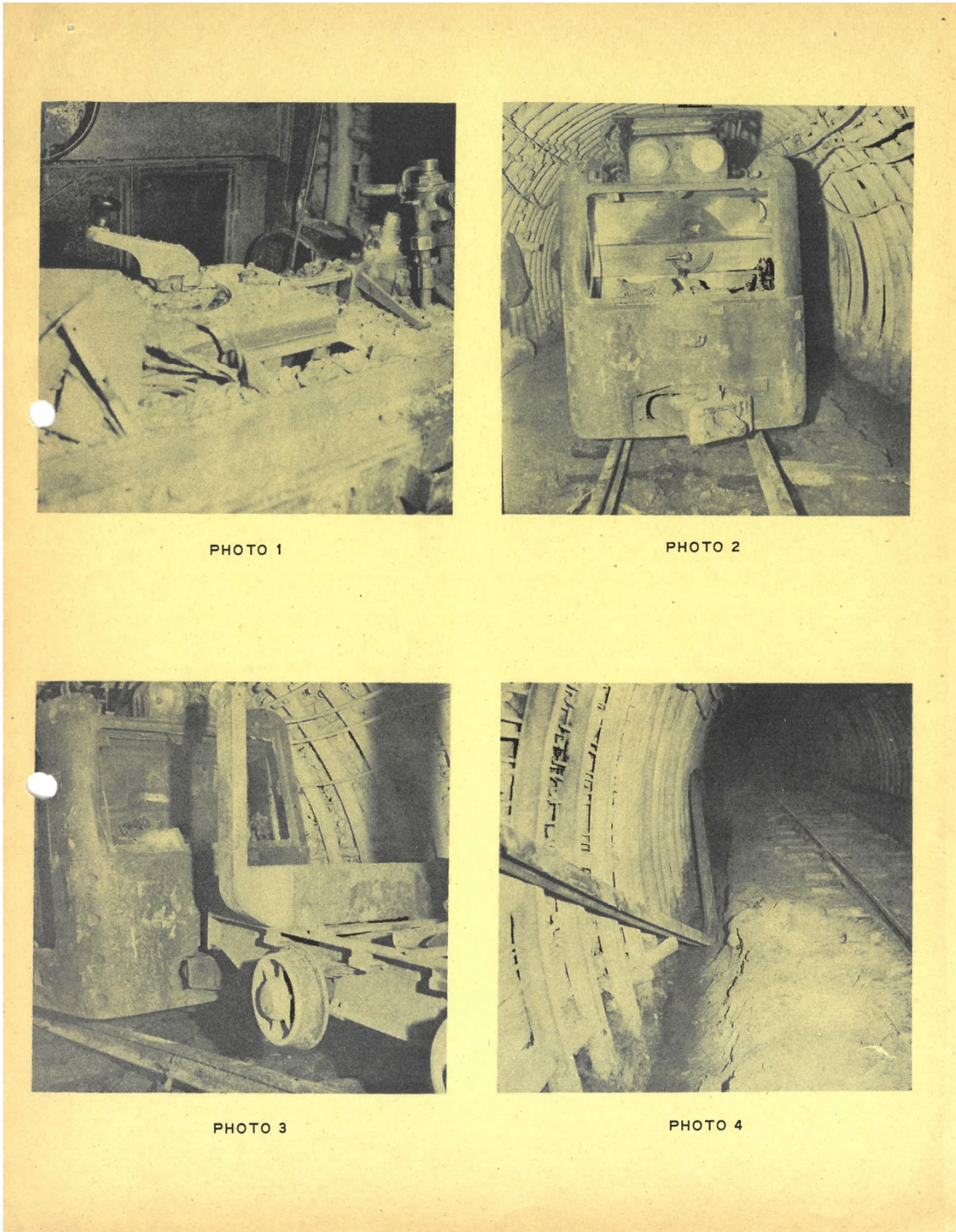
PHOTO 3

PHOTO 4

Figure 34. Photographer unknown, "Untitled [Accident mortel 1/61], c. 1961. [119]
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[119] Accidents linked to the movement of workers were the second most widespread type of fatal accidents in Lorraine collieries in the 1960s (See figure 31, page 63).

3 - Re-presenting the accident (II): the scene of simulation

aetiology - mid 16th century: via medieval Latin from Greek *aitiologia*, from *aitia* 'a cause' + -*logia.* The investigation or attribution of the cause or reason for something, often expressed in terms of historical or mythical explanation.

Oxford English Dictionary.

3.a. Imaging flames and flame behaviour: the simulation experiment, the testimony, and the syncope

[…] j'ai eu l'impression de voir à certains endroits de la galerie D comme du feu en suspension, plus justement des rougeurs, car je n'ai pas vu de flammes.[120]

At certain points in gallery D I thought I could see something like fire in suspension in the air, more precisely red floating patches, for I saw no flames. (My translation of the above)

Je me suis jeté à terre lorsque j'ai vu monter la flamme. J'ai retenu ma respiration pour que mes poumons ne soient pas brûlés.[121]

I threw myself to the ground when I saw the flame grow. I stopped breathing to prevent my lungs from being burnt. (My translation of the above)

The photograph of a flame may be arresting. While the photographic image stills such flame in its consuming and chaotic movement visually, that is, spatially on the surface of the paper, my eyes are drawn to the photograph's structural limitation: its overexposed centre. It is the point where one is faced with the photograph's limited capacity to document or re-present. A point where cognitive activity and observation come to a stand-still. I am affected by this limit. The flame that is imaged here is anchored to structures which it seems to consume: a succession of what appears to be curved bars forming a kind of tunnel. One comes to wonder about the scale of this flame and of the structures it appears to consume, and about the area of darkness surrounding the scene. What is this image the scene of? Beyond the question of depicting the flame's movement, stilled by means of the photograph, one is then led to ponder about the flame's depth, its constitution or architecture, the conditions for its occurrence, and finally, about its social dimension.

We decided to try to observe the behaviour of the flame by building transparent models of the sites of explosions about which a lot was known. By this means some knowledge would be gained of the spread of flame in non-homogeneous mixtures in typical mine configurations,

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[120] Extract from a statement relating to the 1959 Sainte Fontaine disaster made on June 11, 1959, by an 18-year-old miner who survived an explosion which took the lives of 26 workers. *Témoignages* (testimonies), Sainte-Fontaine, June 1959, Dossier 2167CAITM, CAITM, Saint-Avold, France.

[121] René Sachs survivor of the Sainte Fontaine disaster quoted in La Semaine, "1959: coup de grisou à Sainte-Fontaine." (1959: Methane Explosion at Sainte-Fontaine) *La Semaine,* 17 May 2009.

and, if theoretical considerations showed it to be justified, such models might be used to investigate explosions in which other evidence was lacking.[122]

The photograph documents the propagation of a flame in an evental chain that is the result of an orchestration. While I become aware that the image documents a simulation experiment, it persists in affecting me in a manner that cannot fully be articulated within a pure techno-scientific logic.

> Survivors have described flames which moved backwards and forwards or which lingered at a point for some time. This behaviour is not observed when a flame spreads through homogeneous mixtures of firedamp and air, and must have been due to imperfect mixing of the inflammable gas with air in these explosions.[123]

The movements and behaviour of the documented flame are the products of a complex chain of evidentiary procedures. It constitutes a methodological tool and enables a process of verification. Such flame is different in quality from those experienced by workers: "[s]urvivors have described flames which moved backwards and forwards or which lingered at a point for some time."[124] The simulation experiment paradoxically attempts to reproduce the effects of empirical conditions that it *cannot* reproduce, by relying on inference and speculative modelling in the context of a sanitized version of such conditions. This points to a limitation facing a form of power that aims to turn the test of flames into a form of knowledge. It may be argued that simulation is the scene of another form of rehearsal, resulting from a drive to repeat risk-fraught conditions in the attempt to attenuate the traumatic effects of the accidental and the anxiety linked to the aleatory or the threat of further danger.

  The photograph that draws my attention is retrieved from a set of files relating to the collective fatal accident of Sainte Fontaine which took place on May 29, 1959, in the early morning. A firedamp or methane explosion at 600 metres underground caused the death of 26 workers and left 33 others severely burnt or maimed. The archival file is inventoried with the reference "2167CAITM Catastrophes minières" (mining disasters) and comprises four different sets of documents entitled as follows: "Principes de sécurité" (Principles of health and safety); "Maquette" (Simulation Model); "Correspondances" (Communications); and "Expertise." The photograph is not in fact directly, or referentially, linked to the accident in question, but was retrieved from an article published in *The New Scientist*, which employees at *Centre d'Etudes et Recherches de Charbonnages de France*

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[122] Harold Titman, "Use Of Models to Simulate Mine Explosions," *The New Scientist*, vol. 7, n. 177 (7 April 1960): 873. This article was reproduced and translated by staff of CERCHAR and is held in a dossier compiled by CERCHAR in July 1961, Dossier 2167CAITM, CAITM, Saint-Avold, France.
[123] Titman, "Use Of Models," 873.
[124] Titman, "Use Of Models," 873.

(CERCHAR)[125] have reproduced for research purposes in the planning of a first simulation experiment in July 1961.[126]
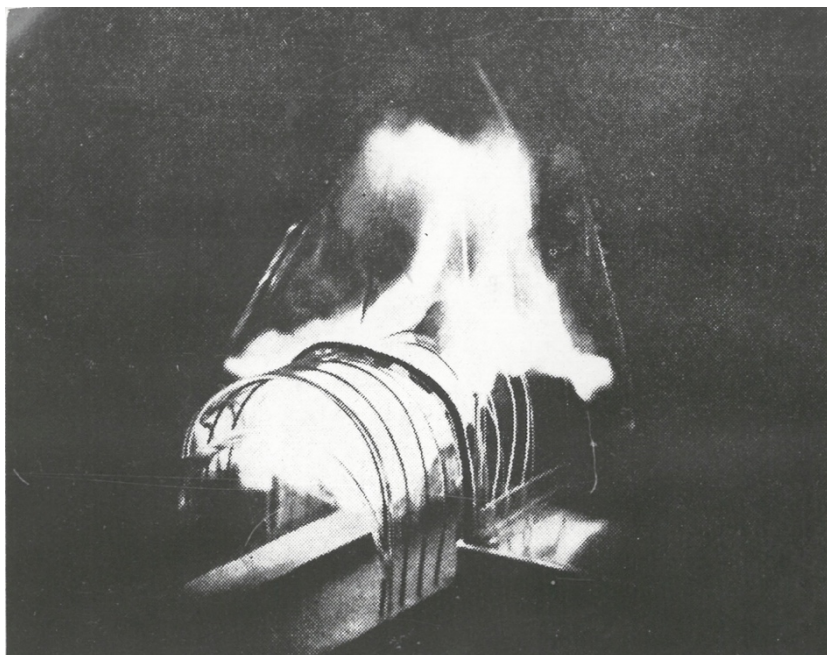
Figure 35. Photographer unknown, "Flame in the model," c. 1960. Photograph © Crown Copyright, Health and Safety Executive, all rights reserved. Reproduced courtesy of the HSE Science and Research Centre.

The experiment would speculatively attempt to reproduce the conditions that led to the disaster. Other documents include communications with a state-run laboratory in Sheffield, England,[127] whose experts in simulation had been solicited to assess the validity of the Sainte Fontaine test by HBL (see Figure 38). The disaster gathered international efforts at the level of logistics (at the time of rescue) and in scientific procedures. The judicial inquiry that was conducted to ascertain the circumstances leading to the accident however remained inconclusive. The disaster is referred to as an "enigma" by René Sachs, one of its survivors:

> On May 29, 1959, France was stunned by the news of a firedamp explosion in a mine of the Collieries of Lorraine, Sainte-Fontaine. The causes, circumstances, and responsibilities relating to this tragic explosion have never been revealed. And this accident therefore became an

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[125] The Centre for Studies and Research of the Collieries of France provided CdF with studies in workers' safety, metrology of airborne dust particles and methane, and respiratory illnesses. See *L'Institut National de l'Environnement Industriel et du Risque,* INERIS (the French National Institute for Industrial Environment and Risks). https://www.ineris.fr/en/ineris/brief/background.

[126] A second simulation experiment took place in November 1963.

[127] The Safety in Mine Research Establishment, part of the British Ministry of Power.

enigma. The judicial inquiry, which was immediately started and announced in a public press release, became mired and the case was closed without being resolved. (My translation)[128]

The 1960 *New Scientist* article was translated in its entirety by CERCHAR. I read the text twice in its two versions. Both versions were inserted with documents relating to the technical inquiry conducted to clarify hypotheses formulated about the causes and circumstances of the accident, i.e., its aetiology. Importantly, it constitutes a methodological source for the Sainte-Fontaine inquest and comprises a series of technological procedures of visualisation and documentation to be used during experiments. Two sets of simulation experiments would take place, in 1960, and 1963. Each time, experts, despite the complexity and rigour of their efforts, concluded to the impossibility of producing "conditions of similitude," and results therefore remained invalid, leading to an inconclusive judicial process. Despite its efforts and the expenditure of means it deployed, the firm was powerless in tracing the accident's full circumstances, at a technical or organisational level.

There are no known photographs of the direct aftermath of the 1959 Sainte-Fontaine catastrophe due to the extremity of the risks involved in returning to the underground galleries. The dossier however contains a series of photographs documenting the process of building the first transparent model used by CERCHAR. The series comes to constitute a fragmentary originary narrative about the process of simulation. While the photographs are endowed with an illustrative function, the record of the maquette's production is incomplete. Significantly, the actual experiment and the destructive impact of the simulated explosion on the model are not documented. A second series of photographs relates to a second model build in 1962-63 (see Figure 43, page 80). In the absence of direct photographic record of the topography of the Sainte-Fontaine disaster, testimonies of survivors and rescue teams gathered at the time of an internal inquest, offer a very valuable description of the events experienced by the workers. The actuality of the accident in this instance could not be recorded due to the risk of further possible explosions and loss of lives.

The testimonies shed light on what no aftermath photographs nor any simulation experiment could record or represent. However, most testimonies made by survivors that were present closest to the site of the explosion refer to the fact that at the onset of the explosion workers at most risk lost consciousness. Hence, the testimonies highlight that a number of workers did not witness the

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[128] "*Ce 29 mai 1959, la France entière fut stupéfaire par l'annonce d'un coup de grisou dans une mine des Houillères de Lorraine, Sainte-Fontaine. Les causes, les circonstances, les responsabilités de cette explosion tragique, n'ont jamais été révélées, cet accident devenant ainsi une énigme. L'enquête judiciaire, démarrée de suite et annoncée par un communiqué public, s'est enlisée en classant l'affaire sans explication.*" René Sachs, *L'énigme d'un coup de grisou: l'enquête d'un rescapé de Sainte-Fontaine* (Bouvignies: les Éditions Nord Avril, 2009), 223.

explosion, nor were they able to recall seeing any flames. That these workers experienced a form of collective syncope at the time of most danger, evokes the sheer violence of the event:

> A few meters away from me, in the direction of the coal front, were two men; they were on their break, eating. I felt a very warm gust of air. I cannot tell where it was coming from, nor what its direction was, for I immediately lost consciousness. I only came back to my senses in the hospital in Lyon at the time of my first bath as a patient. I have no recollection between these two moments. I later learnt that I was found near the coal front with the other two men. (My translation)[129]

Paradoxically, what leads to the evocation of the workers' loss of consciousness in the event of a catastrophe is the will to elucidate, which forms the basis of a right of inspection on the part of the firm and judicial authorities. Legal procedures in place at the time of the inquest demanded from the injured workers that they deliver a testimony: to be a legal witness and to provide the description of an event that only they could experience. In reporting a near-death experience, the scene soon collapses into the realm of unconsciousness. Inadvertently both the internal inquest testimonies and the *procès-verbaux* (police hearings) are equally structured around this informational hollow caused by the generalised syncope experienced by the *accidentés* (accident victims). The work accident is not only endowed with an an-economic dimension as a kind of event that interrupts the accumulation of coal (and value), but it is also endowed with what could be referred to as an an-archivic dimension in that it poses limits to the power to archive or represent. A dimension which also finds expression in the event of the worker's syncope. While the syncope highlights the sheer strain that a worker's body and psyche endure in extreme danger, it comes to constitute a disturbance for powers at hand in the production of knowledge, while the force that it evokes, that of survival, reverberates throughout one's encounter with and reading of documents:

> A cloud of dust rose from below, a cloud that was getting warmer and hotter; I crouched down as I turned in the direction of the coal face. Almost immediately, that is, a few moments after the appearance of dust, a flame traversed the crosscut. This flame also originated from below and it seemed to me that it was located at the blast front (this impression is confirmed by the fact that I was more prominently burnt on my left side). I thought that there had been a firedamp explosion. I lost consciousness for a period that must not have been very long and when I regained consciousness, my only thought was that I must escape. My lamp was still working but I had trouble seeing as my eyelids were stuck together [due to being burnt]. (My translation)[130]

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[129] Testimony of Léon Krier, 27-year-old precision mechanic (internal report), n.d., Dossier 2167CAITM2, CAITM, Saint-Avold, France.

[130] Testimony of René SACHS, 20-year-old category V worker and cutting drum operator, 16 October 1959, Dossier 2167CAITM2, CAITM, Saint-Avold, France. See Appendix 3 for French original.
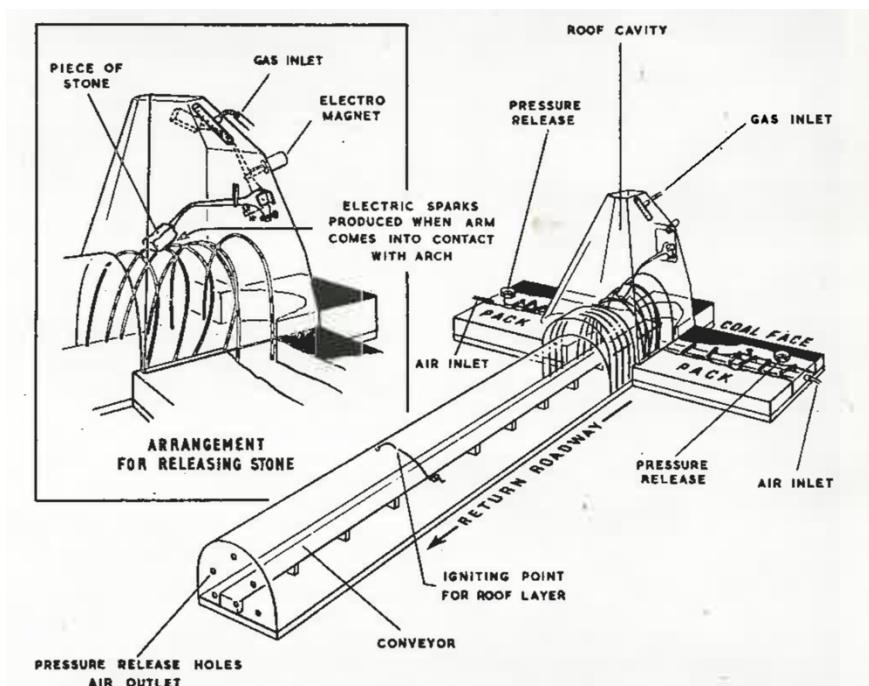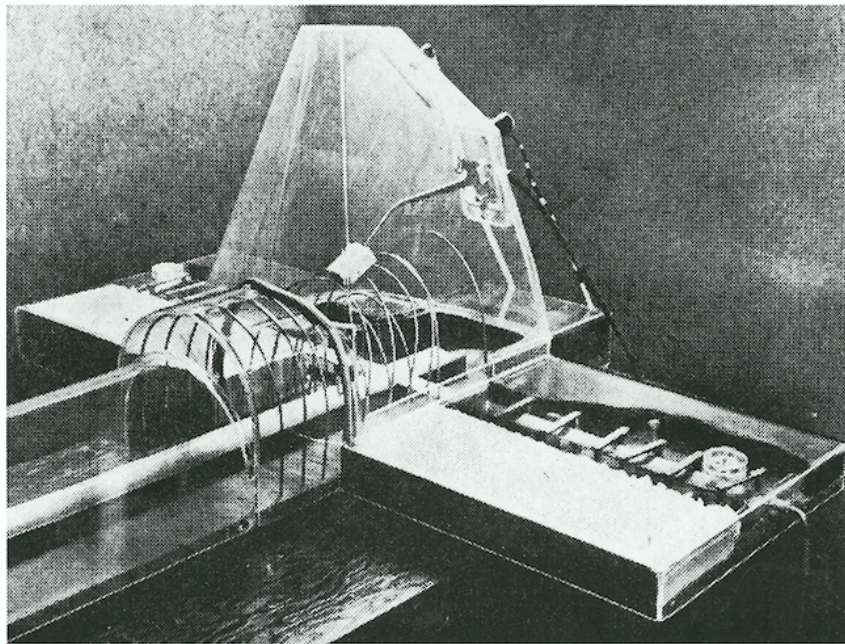
Figures 36 (top) and 37 (bottom). Photographer and artist unknown, "Model of cavity at a road head," c. 1960. A simulation model and its diagram. Photograph and diagram © Crown Copyright, Health and Safety Executive, all rights reserved. Reproduced courtesy of the HSE Science and Research Centre.

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Please address any reply to
THE DIRECTOR
at Sheffield/Buxton
and quote
Our reference: A311/255/02 Pt. 3.

Your reference:

22nd November, 1963.

Dear M. Champagnac,

Model of Ste-Fontaine Explosion 29.5.59

1. I am writing to put on record my comments on your model of the Ste-Fontaine explosion which I had the opportunity to see during my visit to Merlebach, 6th to 8th November, 1963. During my stay you posed a number of questions, and it might be useful if I put my comments in that order below.

The gas distribution in 'C'. 2. Is the distribution of gas in the model in seam C similar to the distribution in the pit? In principle, the following conditions must be satisfied to obtain similar gas distributions: a) Geometrical similarity, b) the gas to be injected in the same places, c) the ratio of gas emission rate to ventilation rate the same, d) same layering number, e) same Reynolds number, and f) the same value of the ratio between the molecular diffusion coefficient and the product of velocity and a typical linear dimension. When using the same gases f) is automatically satisfied if e) is.

3. In the model you have aimed at satisfying conditions, a, b, c, and d, which leaves us to consider the Reynolds no. In many cases it is not important to have the correct Reynolds no. in the model provided its value is large enough to ensure that the flows are turbulent. In the present case, some approximate calculations of Reynolds no. based on the velocity of the buoyancy currents in 'C' suggest that the Reynolds no. is on the low side. This means that it is very doubtful whether the distributions are in fact similar. What we cannot say is how much the distribution in the model differs from that in the pit.

4. In the circumstances, I think the right thing to do is to work on the assumption that the gas distribution in the model in C is not similar. It does not follow, however, that the model is without any value at all. In certain circumstances the flame spread may be similar even if the gas distribution is not exactly the same, provided the overall fuel-air ratio is the same. Also, it is often possible to use the model itself to examine what possible effects a different gas distribution would have on the flame spread and other aspects of the explosion.

5. During my stay you carried out a series of experiments varying the gas distribution in 'C', the point of ignition, and the terminal resistances, and we observed the resulting flame spread and blast. To these observations one can apply the following: If the gas distribution in the pit had been similar to that set up in the model, and if the ignition had been in the same place, then it is possible that the flame spread and blast in the pit would have been similar to that in the model. It is stressed, however, that the explosion in the pit would not necessarily have been the same as that observed in the model. However, it is possible to say a little more on the basis of the observed flame behaviour in the model itself. In the particular cases observed during my stay I would be inclined to think that it is likely that the gross behaviour of flame and blast observed in the model would have been similar to that in the pit if the gas distributions and ignition points had been the same.

/Gas ...

Monsieur G. Champagnac,
Houilleres du Bassin de Lorraine,
Poste Central de Secours,
MERLEBACH,
France.

Figure 38. Author unknown, "Model of Ste-Fontaine Explosion 19.5.59," 22 November 1963. Letter © Crown Copyright, Health and Safety Executive, all rights reserved. Reproduced courtesy of the HSE Science and Research Centre.

Fig. 7

Fig. 8
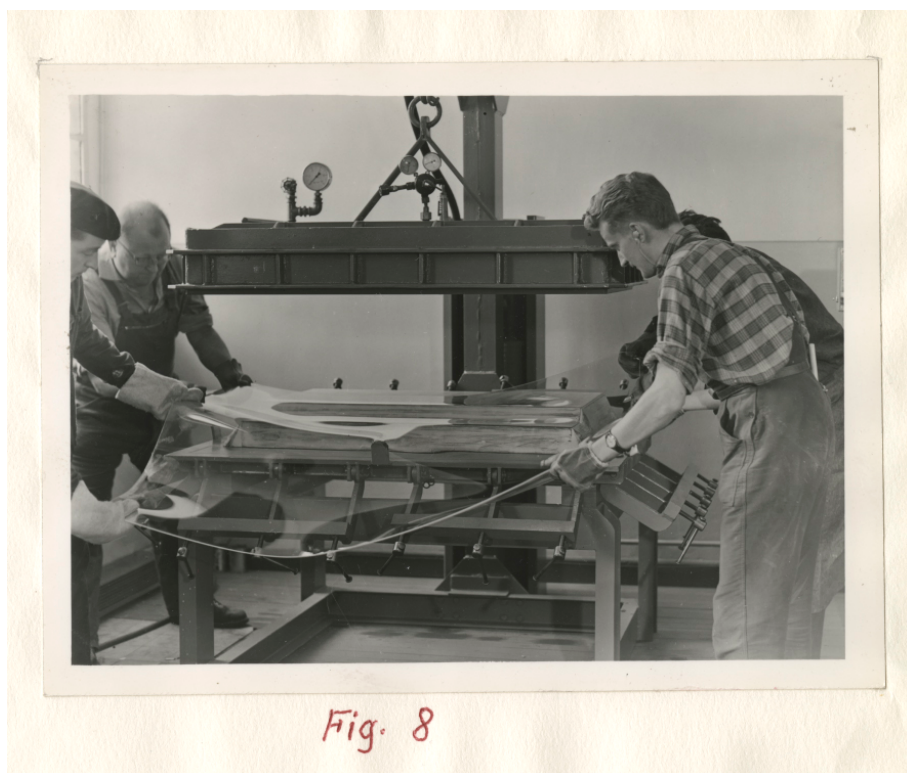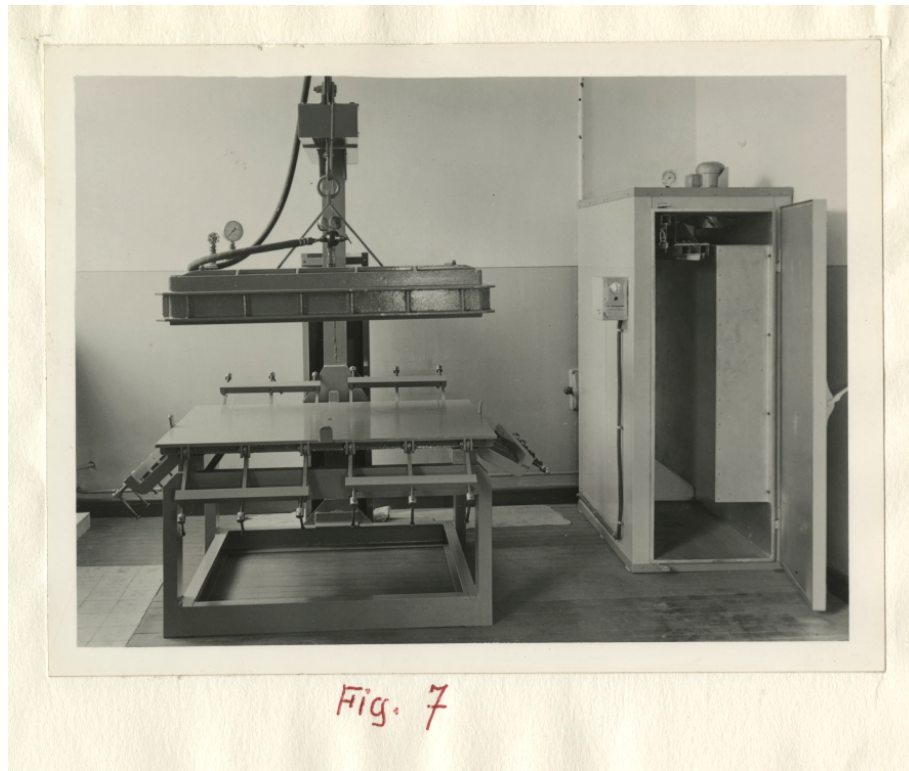
Figures 39 and 40. Photographer unknown, "[Untitled photographs]," 1961.[131]
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[131] Photographs showing the making of a transparent simulation model relating to the 1959 Sainte-Fontaine diaster.
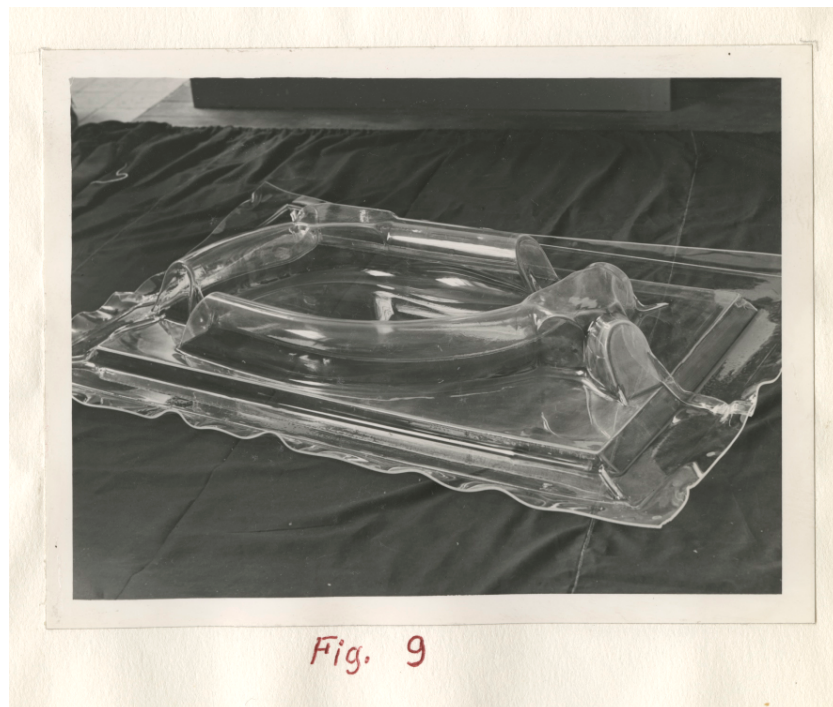
Figure 41. Photographer unknown, "Untitled [Transparent simulation model]," 1961.[132]
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

3.b. Transparent models: conditions of similitude, prediction, and biopolitics

A series of techno-scientific means are marshalled or invented in the attempt to give structure (scientific, logical, legal) to the flame and its operations. And visualisation constitutes one of the methods deployed to bring forth its structuring principles:

> In a certain number of cases one can observe that in a (simulation) model, the time taken by the flame to propagate itself can be divided by the latter's geometric scale. The ratio of times is equal to the ratios of lengths, the flame's speeds being, in fact, conserved. As a result, the flame propagation time in the model is very short. To properly observe the phenomenon, it is interesting to film it using the appropriate lighting. (My translation) [133]

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[132] Part of a transparent simulation model in construction representing the subterranean topography of a mining gallery in the Sainte-Fontaine coal mine.

[133] Typed study "Étude sur maquette des explosions de grisou – Application de la méthode en usage en Angleterre pour la reproduction sur maquette du coup de grisou du 29 Mai 1959 au Siège Sainte-Fontaine," (Model-based study of firedamp explosions – Application of the method in use in England for the reproduction on model of the firedamp methane explosion of 29 May 1959 at the Sainte-Fontaine Headquarters) by CERCHAR, 25 July 1961, Dossier 2167CAITM, *CAITM*, Saint-Avold, France, page 8. For the quote in French see Appendix 4.

In the territory of the archive of extraction one will thus encounter an image of destruction that has sometimes been constructed or orchestrated methodically for forensic purposes, in an attempt to elucidate or to speculatively represent chains of events that escape the order of prediction. Here the flame, the product of a simulation that consumes and destroys, is carefully planned, observed, and documented. Simulation is undertaken in the attempt to analyse and systematize the circumstances and conditions of the accident that comes to interrupt life, that of the worker, and to disrupt the extractive process. This evidentiary procedure seems to answer a dual set of interests: firstly, to produce statistical measurements for predictive usage aimed at re-establishing or maintaining a normalised order of economic production; and secondly, to explain the conditions that led to the loss of lives and answer the demands of a judicial inquest.

The flame is the product of an aetiological apparatus, and its image constitutes one specimen in the typologies found in the heterogeneous archive of work accidents. The orchestration of simulations constitutes a critical and pivotal scene in mapping and representing an accident's terrain, its chronology, actual and imagined, and its technical circumstances. The flame and its documentation serve an observational methodology aimed at unravelling an accident's causes through an artificial, evidentiary chain of events (mechanical, chemical, geological…). Simulation, elucidation, and predictive inferences come to inform procedures of risk prevention at the level of the corporation, while also exemplifying the complexity of efforts deployed by industrial power to circumvent, contain, or prevent the accidental.

> A phenomenon obeys to the principle of a law that, if it is sufficiently well known, can be translated into a system of relations between the different factors that such phenomenon calls forth. […] In order to conserve the law that underlies the phenomenon, one must modify the other factors in such a manner that the system of equations that translates this law remains identical to itself. It is in writing this identity that one obtains the relations of similitude which must exist between factors. (My translation)[134]

In attempting to produce "conditions of similitude" necessary to re-enact the accident's circumstances and chain of events, the simulation experiment reveals a particular complex of discourses and practices where techno-scientific and economic rationalities converge. The attempt to re-present the accident reveals a series of obstacles that power encounters while aiming to remain operative: the accident becomes the revelator of a particular kind of logic and power – a form of power that strives to prevent aleatory events or attenuate their effects.

The corporation's recourse to simulation may be problematised through the notion of *regulatory processes* pertaining to biopower in order to establish and maintain a form of

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[134] CERCHAR, "Etude sur maquette," 8.

"homeostasis"[135] referred to previously, while the technological re-enactment of an accident's conditions may be problematised within the logics of prediction characteristic of biopolitical mechanisms.[136] While it rehearses technical conditions (such as atmospheric composition of toxic gas), the simulation experiment requires the deployment of existing or new visualization methods that allow to record subtle modifications in such conditions or to reveal phenomena that can only be recorded technologically:

> Since the models are transparent, high-speed photography can be used to observe and record the movement of the flame. Since it is also desirable to know the movement of the firedamp ahead of the expanding flame, a technique has been developed whereby *the firedamp is made visible to the camera by means of fine smoke*. Before being led to the model the firedamp is introduced into a closed air-free chamber. This chamber contains a nichrome wire coated with a cellulose varnish into which a suitable metallic salt has been incorporated: *when the required quantity of firedamp has been admitted to the chamber the wire is heated and a fairly dense cloud of smoke of very fine white particles is produced*. This smoke remains with the firedamp and indicates the position of the gas in the model before the explosion develops. *For ease of identification colour pohtography can be used, the model being illuminated with green light*: *unburnt firedamp thus appears as a green cloud into which orange or blue flame is spreading*.[137] (My emphasis)

Photography is here deployed *in conjunction with* other visualisation devices (e.g., nichrome induced smoke, green lighting, …), it is therefore inscribed in a technological ensemble to operate *in correlation with* such elements, in a nexus or complex comprising material as well as logical instruments.[138] Industrial technologies of visualisation and archiving deployed or invented to unravel work accidents aetiologies ought to be understood, beyond the question of representation, as technologies serving regulatory processes maintaining the homeostatis upon which productive activity and the reproduction of the system of surplus-value depend. Simulation and its documentation ought to be understood as enacting the regulatory logics deployed by biopolitics with regards to random events. A further exposition of the relationship of aleatory events to biopower will be discussed in Chapter 3.

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[135] Foucault, *SMBD,* 249.
[136] See Chapter 3.
[137] Titman, "Use Of Models," 875.
[138] This will be discussed from the perspective of the *dispositif* in Chapter 3.
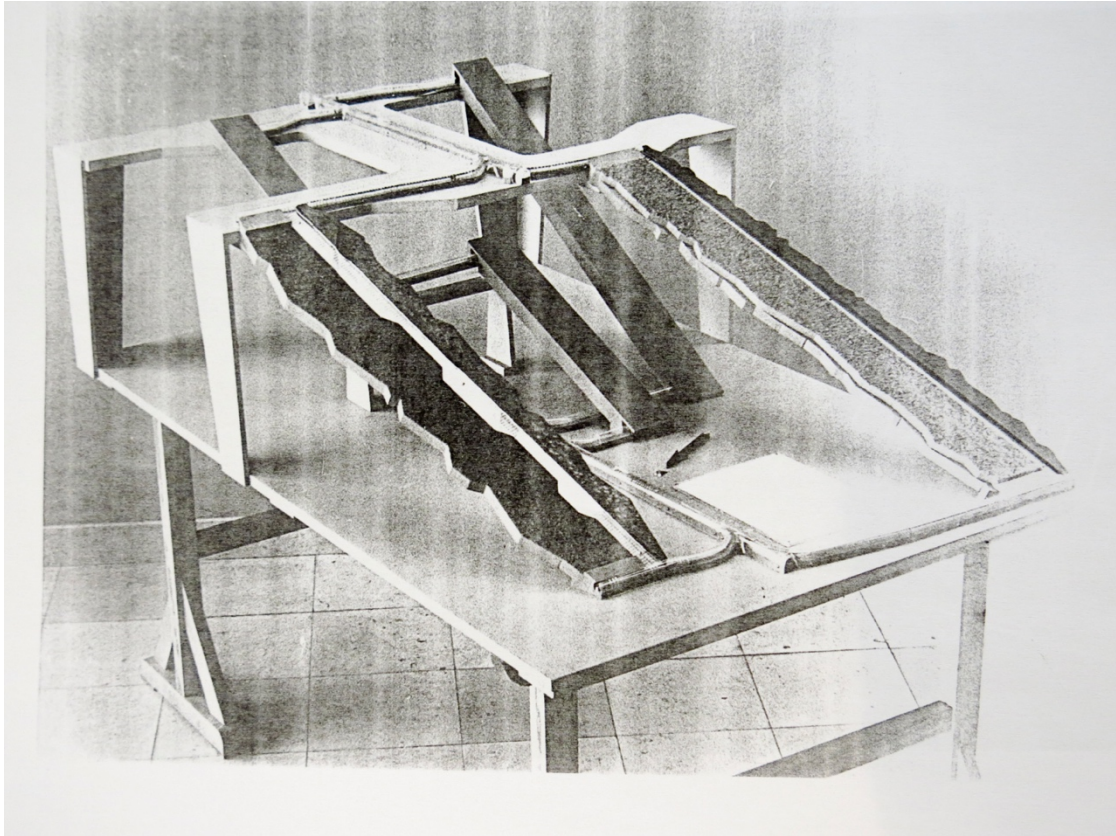
Figure 42. Photographer unknown, "Untitled [Simulation model]," n.d.
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.
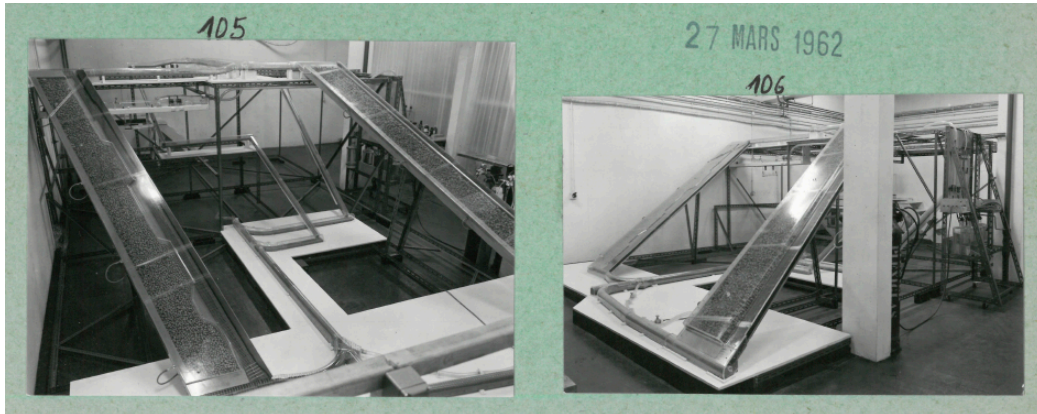
Figure 43. Photographer unknown, "Maquette et modèles," c. 1962.[139]
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[139] Second simulation model relating to the 1959 Sainte-Fontaine disaster.
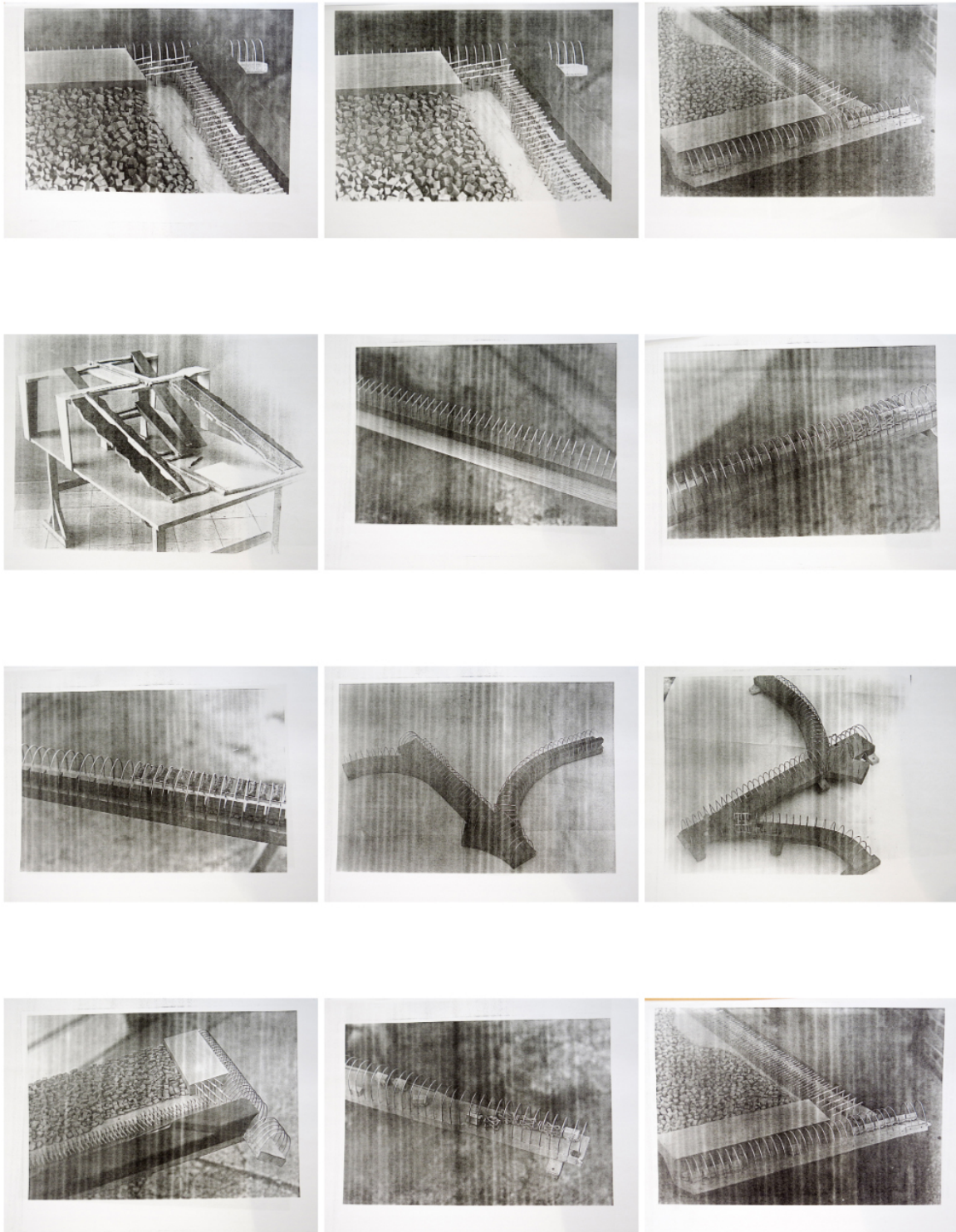
Figure 44. Photographer unknown, "Untitled [Photocopies of untitled photographs]," n.d. [140]
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

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Chapter 2

Figurality, Affect, and the Image of the Accident:

The Re-Enactment

1 - Becoming figure and the material economy of the photographic document

1.a. Sensible differentiations: "Accident mortel 6/68 - N. d'Archive: III – E. 532 (4)"[141]

Closed eyes mark an extremely minimal space as if traced through the minute actions of precision drawing. An instrumental process has led to these eyes being traced in this manner and form, resulting from an operation of capture and framing. The mark that each eye has left on this surface recalls a kind of suspension mark or a hyphen, as if it were a unit of tracing. The act of looking may subdivide this mark into smaller ones until it reaches a limit. The surface that corresponds to the zone where the upper part of the nose and the lower part of the forehead meet forms a uniform tonal plane. The recorded epidermis seems texture-less. The plane of the epidermis at the juncture of the eyes, forehead, and upper part of the nose, transposed to the realm of photographic recording, has become the site of a correspondence in the act of reading the image. The body as trace now corresponds to itself as body in the past, differentiable, other. The photographic document has become the locus of a differentiation, material, and figural: a kind of doubling of the body into figure through a form of imaging. One may say that the process that submitted this body to becoming an image in the act of documentation and photographic capture pertains to another form of extraction, a process of abstracting from the scene recorded resulting in the photographic document. One will attend here to the process that turns the worker into an image materialised on the surface of the photograph and a figure of representation, in the context of the re-enactment of work accidents.

A dark line marks the outline of the nose. It echoes another line marking the contour of the chin on the right hand-side of the face. The thickness of the line marking the nose suggests a kind of staining, that one is at pains to identify due to the monochromatic nature of the image. The tonal quality of the staining resembles that of patterns and marks found on the ground surface. A helmet casting a shadow onto the background surface seems at first afloat in mid-air, although it is suspended from a wire fastened across the scene between two vertical wooden beams. The stillness of the object's poise recalls that of the figure of the worker who is lying on the ground. The worker's body language indicates that he may have fallen. This stillness, while being principally the result of photographic capture, seems endowed with a degree of artificiality that may be linked to the orchestrated dimension of a re-enactment. My gaze oscillates from figure to helmet repetitively.

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[141] HBL, "Accident mortel 6/68: Chute de l'ouvrier dans le bassin près du barrage pendant le remblayage hydraulique," (Fatal accident 6/68: Fall of the worker into the basin near the dam during hydraulic backfilling) Dossier 55HBL21, CAITM, Saint-Avold, France.

Despite this oscillation I cannot however conjure up, speculatively, a full sequence of the events that would lead to the disjuncture between body and object. The re-enactment of fatal accident 6/68 was undertaken for the purpose of a "*reconstitution photographique*" (photographic reconstitution) to support the analysis of the hypothetical causes that might have led to the fall of a coal miner in a drainage stream, resulting in his drowning. The file provides a list of injuries sustained by the worker and a summary of the circumstances leading to the accident. The author of the file indicates that this type of accident is very rare, and its tragic outcome may have been avoided if the wearing of life vests were a normalised practice.

Figure. 45. Photographer unknown, "Untitled [photographic re-enactment of Accident mortel 6/68]," c. 1968. Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

BLESSURES:
- Etouffement sous déblais.
- Broncho-pneumonie massive consécutive à noyade ayant entrainé le décès par dissémination de l'infection.
- La victime est décédée 13 jours après l'accident.

INJURIES:
- Suffocation under rubble/debris.
- Severe broncho-pneumonia due to drowning provokes passing away by
  dissemination of the infection.
- The victim passed away thirteen days after the accident. (My translation) [142]

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[142] HBL, "Accident mortel 6/68," 1.

CIRCONSTANCES RÉSUMÉES:

Un piqueur, chargé de surveiller et de régler l'évacuation des eaux de remblayage sur le barrage de retenue, est aperçu se débattant dans le schlamm (eaux boueuses) où il était presque entièrement immergé.

Il est secouru immédiatement par ses camarades et ranimé par le "bouche-à-bouche."[143]

SUMMARY OF CIRCUMSTANCES:

A drill operator, in charge of monitoring and regulating the discharge of backfill water on the dam, is seen struggling in the sludge where he was almost entirely submerged. He is immediately rescued by his comrades and revived by "mouth-to-mouth" resuscitation. (My translation)

As one's gaze navigates the sequence of three images presented in the accident file, one notices differences in vantage points marking a change in the positioning of the photographic camera and of the image-maker in relation to the scene. The shadows cast by the worker and by objects indicate the use of artificial lighting and emphasise the process of photographing. Without the use of photographic flash this scene would not have been recordable, which is also a reminder of the very limited level of luminosity available to miners when undertaking complex and risky work. Labouring in the narrow beam of a headlamp, while engulfed in darkness, dust and damp, heat and noise, hours on end. The sequence of three photographs, intended to represent what have been identified as three significant moments in the accident, are accompanied by three captions that describe three states of the worker's positioning and bearing in a strictly constative register:

> 1) *Le remblayeur est debout sur le blindé*
> 2) *Le remblayeur est agenouillé sur le blindé*
> 3) *La victime est tombée dans la lavée* [144]
>
> 1) the coal packer is standing on top of the armoured container
> 2) the coal packer is kneeling on the armoured container
> 3) the victim has fallen into the drainage stream (My translation)

The photographs seem at first to echo the captions visually in a tautological manner. As one reads the list, one is struck by a disconnect between the neutrality of tone used to describe what may amount to quotidian actions in coal mining and the tragic dimension of the fatal accident. As one observes the sequence of three images, one is compelled by its fragmentary dimension, echoed in the terse character of the captions. Significantly, there were no witnesses present at the time of the incident, leading the author of the analysis to formulate a short probable scenario.

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[143] HBL, "Accident mortel 6/68," 1.
[144] HBL, "Accident mortel 6/68," 5.

ANALYSE DES CAUSES

Par suite de l'absence de témoins, on ne peut que faire des hypothèses. L'hypothèse la plus plausible (voir reconstitution photographique) est que, s'étant agenouillé sur le blindé, le remblayeur a voulu contrôler avec la main le niveau de sable ou la nature de la lavée.

C'est alors qu'il a perdu l'équilibre et que, la tête la première, il est tombé dans le remblai.[145] Cette perte d'équilibre peut être la conséquence d'un malaise ou d'une mauvaise position.[146]

ANALYSIS OF CAUSES

In the absence of any witnesses, one can only formulate hypotheses. The most plausible hypothesis (see photographic reconstitution) is that, while kneeling on top of the armoured container, the coal packer tried to check the level of sand and the nature of the waters by hand.

It was then that he lost his balance and, headfirst, fell into the backfill.
This loss of balance may have been caused by a malaise [or dizziness] or an incorrect position.
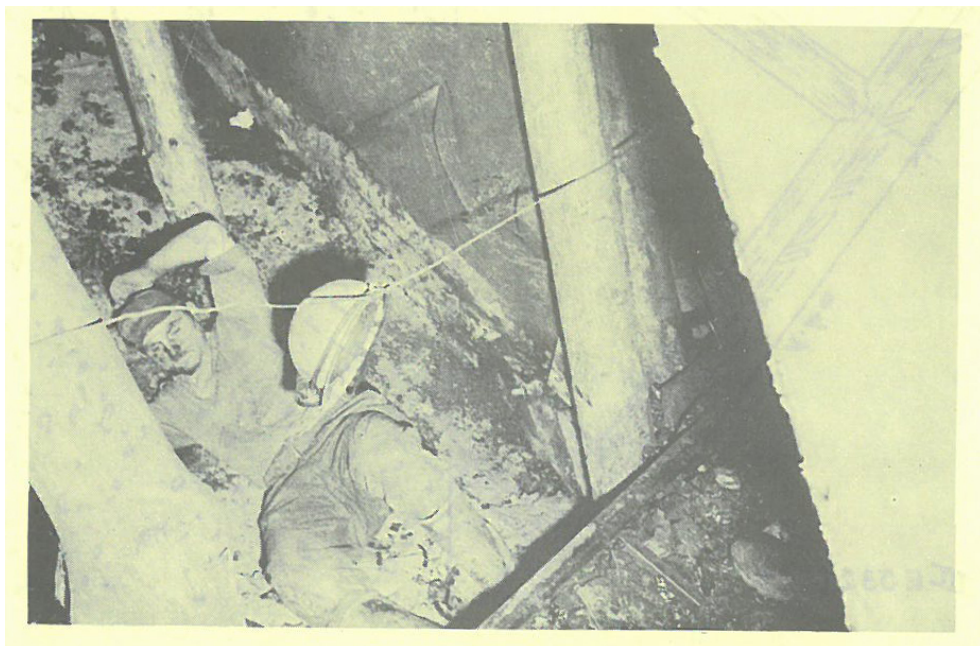(My translation)
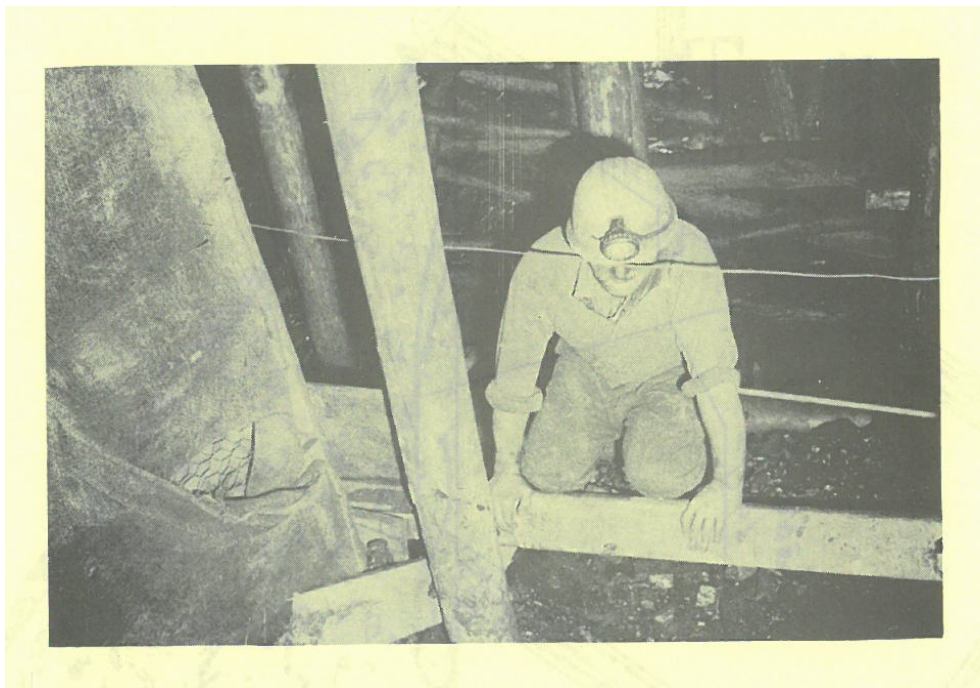
Figure 46. Photographer unknown, "Untitled [photographic re-enactment of fatal accident 6/68]," c. 1968. Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[145] "Remblai" (backfill): a mixture of sand and water used to fill an excavated area of ground.
[146] HBL, "Accident mortel 6/68," 1.

The author of the file calls upon the power of photographic reconstitution to illustrate their hypothesis while the use of the present tense endows the latter with a form of truth-value. However, Photograph 2 in the sequence does not fully replicate the formulated hypothesis: "while kneeling on top of the armoured container, the coal packer tried to check the level of sand and the nature of the waters by hand." The worker turned enactor is not recorded repeating the (hypothetical) victim's actions, which may be an indication of the risk that such actions may present for the worker-enactor themselves. I navigate the sequence of images in reverse order and pause at the second photograph, whose significance, for me, increasingly constitutes the fact that it represents a moment prior to the critical incident of the fall, of which aftermath is re-enacted in third photograph. A figure is kneeling on the edge of what seems to be a horizontal metallic beam (the edge of a container or armoured vehicle according to the caption), which both hands are gripping. The worker, kneeling, appears to be surveying the zone situated below the container, which is represented in the third photograph. A reversal reading of the sequence endows the representation of a moment preceding the advent of the fall with an uncanny intensity.

In the encounter with the photographic re-enactment and the fragmentary, speculative, fiction that it engenders in order to build an evidentiary tableau, a form of hallucinated gaze takes shape: in the artifice of an imagined, utopian reversal of time, the worker turned actor is transfixed into an imaged body, stilled, yet figuring the living. Reading the sequence *à rebours,*[147] the future victim is unharmed and still living. This has become the affect and value, or affect-value, of the central image of the sequence for me. Such affect and value persist in me. The reading of detail leads to the emergence of a new value of the photograph, and I, the viewer, reader, and interpreter, have become the active agent feeling the poignancy of the historical, political grounding of detail and of the document whose value may now be transformed.

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[147] In reverse, or against the grain.

III - E. 532 (4)

Reconstitution photo-
graphique

1) Le remblayeur est
   debout sur le blindé

2) Le remblayeur est
   agenouillé sur le
   blindé
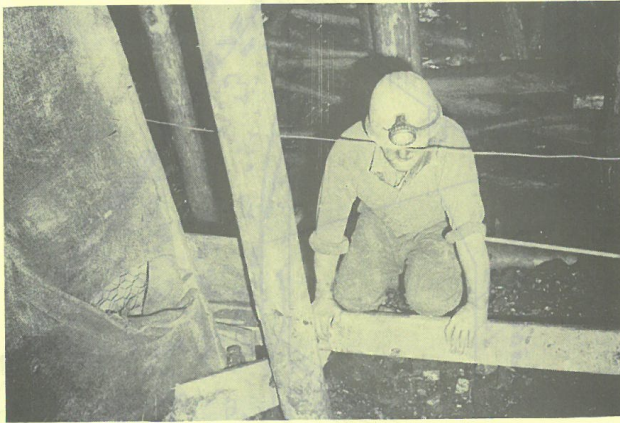
3) La victime est tombée
   dans la lavée
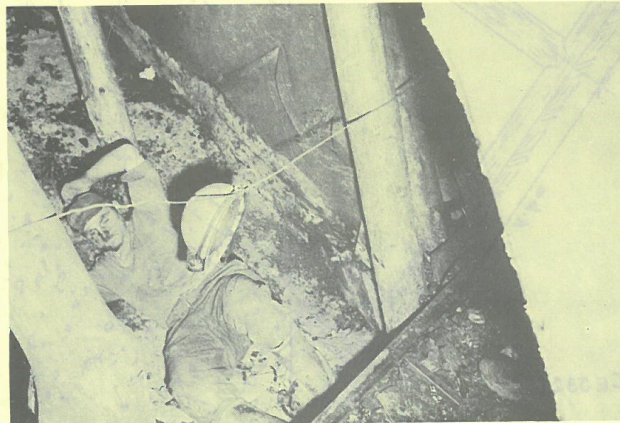
Figure 47. Photographer unknown, "Reconstitution photographique [Accident mortel 6/68]," c. 1968.
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

1.b. Affect-value of the figure (i)

In his essay "The Third Meaning" (1970), Roland Barthes associates the notion of "obtuse meaning" to that of "*émotion-valeur*" (emotion-value) therefore linking the problem of a resistance to signification of certain details (in the stilled cinematic image) to the thematic of emotion as well as to that of value, or to that of the value of emotion:

> I believe that the obtuse meaning carries a certain emotion. Caught up in the disguise, such emotion is never sticky, it is an emotion which simply designates what one loves, what one wants to defend: an emotion-value, an evaluation.[148]

To recall, the *obtuse meaning* or *third meaning* is associated by Barthes with particular details in a stilled sequence of Sergei Eisenstein's *Ivan the Terrible* (1944/1958), which in his eyes become the locus of a form of meaning that cannot be absorbed by intellection:

> the one which appears 'in excess,' as a supplement my intellection cannot quite absorb, a meaning both persistent and fugitive, apparent and evasive […] Now, the features I have indicated – make up, whiteness, false hair, etc. – are they not a kind of blunting of a too evident meaning, a too violent meaning? […] the obtuse meaning seems to extend beyond culture, knowledge, information.[149]

Barthes distinguishes three levels of meaning: 1) an informational level corresponding to communication; 2) a symbolic level corresponding to that of signification; 3) the level of *signifiance*.[150] *Signifiance,* as Barthes points out refers to "the field of the signifier (and not of signification) and [links] up with, via the path opened by Julia Kristeva[151] who proposed the term, a semiotics of the text."[152] The notion of text, not only encompasses signifying practices resulting from the use of words and those associated with art practices such as painting, music, etc. but is understood as the result of a generative process[153] through which the subject and the text are both constituted in relation to each other. It is striking that in "The Third Meaning" the thematic of *signifiance* and a semiotics of

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[148] Barthes, "The Third Meaning," 59.
[149] Barthes, "The Third Meaning," 54-55.
[150] Barthes, "The Third Meaning," 52-54.
[151] In developing a concept of intertextuality in "Word, Dialogue, and Novel" (1966) Kristeva proposes a concept of the text as "a dynamic site in which relational processes and practices are the focus of analysis instead of static structures and products. […] Developing Bakhtin's spatialisation of literary language, she argues that 'each word (text) is an intersection of other words (texts) where at least one other word (text) can be read.'" María Jesús Martínez Alfaro, "Intertextuality: Origins and Development of The Concept." *Atlantis* 18, no. 1/2 (1996): 268.
[152] Barthes, "The Third Meaning," 54.
[153] Barthes gives a description of the concept of "text" as follows: "*Text* means *Tissue*; but whereas hitherto we have always taken this tissue as a product, a ready-made veil, behind which lies, more or less hidden, meaning (truth), we are now emphasizing, in the tissue, the generative idea that the text is made, is worked out in a perpetual interweaving: lost in this tissue – this texture – the subject unmakes himself, like a spider dissolving in the constructive secretions of its web." Roland Barthes, *The Pleasure of the Text*, trans. Richard Miller (New York: Hill and Wang, 197)*,* 64.

production (as an interweaving of subject and text) is associated with the thematic of emotion. This may be read in terms of a relational dynamic of being *affected* and *affecting* discussed in this Chapter.

While "The Third Meaning" takes as its thematic object the film still, it already announces questions later introduced in *Camera Lucida* (1980). Barthes' concept of "third meaning" echoes his interest with aesthetic strategies such as those of Luis Buñuel in his film "The Exterminating Angel" (1962) and Bertold Brecht in theater, which produce the effect of a suspension of meaning.[154]

In *Camera Lucida*, the question of a resistance to meaning associated with photographic detail is more explicitly linked to the notion of *affect*:

> Next, my phenomenology agreed to compromise with a power, affect; affect was what I didn't want to reduce; being irreducible, it was thereby what I wanted, what I ought to reduce the Photograph to; *but could I retain an affective intentionality*, a view of the object which was *immediately steeped in* desire, repulsion, nostalgia, euphoria?[155] (My emphasis)

The problem of how to hold fast to "affective intentionality" and a "view" (*visée*) steeped in emotion seems significant. One may say that it echoes Elena Oxman's concern with "how to write the obtuseness of meaning without subsuming it to the realm of the obvious."[156] However it also departs from it, as it is a question of *maintaining* an affective state and a form of vision transformed by affect rather than that of *writing* about this affective breach. Again, here, the force of an affect, or *punctum*, destabilising the semiotic engagement of a subject with a photograph, is associated with the notion of value and the emergence of a new value of such photograph:

> [...] occasionally (but alas all too rarely) a "detail" attracts me. I feel that its mere presence changes my reading, that I am looking at a new photograph, marked in my eyes with a higher value. This "detail" is the *punctum*.[157]

According to Lisa Cartwright and Elizabeth Wolfson, the turn to affect in writings on photography finds an early instantiation in Barthes' departure from a semiotics of the photographic message[158] and his growing concern with *feeling* – emotion and affect in Barthes' terms – in his later work, i.e.,

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[154] "...[cinema] by its material and structure, [is] much better prepared than the theater for a very particular responsibility of forms which I have called the technique of suspended meaning...The best films (to me) are those which best withhold meaning... To suspend meaning is a very difficult task, requiring at the same time a very great technique and total intellectual loyalty. That means getting rid of the parasite meanings, which is extremely difficult." In Roland Barthes, *The Grain of the Voice*, trans. Linda Coverdale (New York: Hill and Wang, 1985), 19.

[155] Barthes, *Camera Lucida,* 21-22.

[156] Elena Oxman, "Sensing the Image: Roland Barthes and the Affect of the Visual," *SubStance* 39, no. 2 (2010): 80.

[157] Barthes, *CL,* 42.

[158] As "The Third Meaning" suggests, one may say instead that Barthes moves from a semiotics of signs and ready-mades to "a semiotics of the text" inspired by Kristeva's work. See Barthes, "The Third Meaning," 54.

Camera Lucida (1980),[159] which is considered as a seminal text in this respect.[160] The writing of *Camera Lucida* cannot be distinguished from his *experience* of grief:

> "[…] instead of following the path of a formal ontology (of a logic), I stopped, keeping with me, like a treasure, my desire or my grief; the anticipated essence of the Photograph could not, in my mind, be separated from the "pathos" of which, from the first glance, it consists. […] I wanted to explore it [Photography] not as a question (a theme) but as a wound: I see, I feel, hence I notice, I observe, and I think."[161]

Elspeth H. Brown and Thy Phu who associate the affective turn in photographic studies to the influence of feminist and queer scholars, equally locate the beginnings of a theory of *feeling* in Barthes' work, as well as in that of Susan Sontag, namely in *On Photography* (1977) and *Regarding the Pain of Others* (2003)*,* where "the relationship between moral feeling and ethical response" was explored.[162]

As Brown and Phu emphasise there is no scholarly consensus as to a definition of affect or emotion.[163] In *The Affect Theory Reader* (2010), while Melissa Gregg and Gregory J. Seigworth distinguish *"*two dominant vectors" of affect studies in the humanities, one influenced by Silvan Tomkins's psychobiology of differential affects (1962) and the other by Gilles Deleuze's Spinozist ethics of bodily capacities (1988), there are according to them far more differing perspectives.[164] The two strands that they identify as dominant are taken up respectively in essays by Eve Sedgwick and Adam Frank (''Shame in the Cybernetic Fold'') and by Brian Massumi (''The Autonomy of Affect'') both published in 1995. For authors indebted to a Deleuzian exposition of Baruch Spinoza's ethics, affect is defined as a body's capacity to affect another body, where the term body can designate any form of entity.[165] The concept of affect as a dynamic variation is never fully divorced from the reality of ideas or the various degrees of reality of ideas. The continuous coexistence or succession of ideas "affirmed" in us, and their correlating affects, corresponds to the force of existing or the power of acting, or "*potentia agendi*."[166] Following the path open by Sedgwick (and Tomkins), other authors

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[159] However, one may argue that a "growing concern" with feeling does not accurately characterise *Camera Lucida,* as it was written after the death of Barthes' mother and was hence prompted by it.

[160] Lisa Cartwright and Elizabeth Wolfson, "Introduction: Affect at the Limits of Photography," *Journal of Visual Culture* 17, no. 2 (August 2018): 142.

[161] Barthes, *CL,* 21.

[162] Elspeth H. Brown and Thy Phu, "Introduction," in *Feeling photography*, eds. Elspeth H. Brown and Thy Phu (Durham, NC, and London: Duke University Press, 2014), 4.

[163] Brown and Phu, "Introduction," p. 6.

[164] For an overview of the diversity of approaches to considering or defining affect see: Melissa Gregg and Gregory J. Seigworth. "An Inventory of Shimmers," in *The Affect Theory Reader*, eds. Melissa Gregg and Gregory J. Seigworth (Duke University Press, 2010), 6-9.

[165] Gregg and Seigworth, "An Inventory of Shimmers," 3.

[166] Where agreeable ideas increase by power to act, and disagreeable ideas decrease such power: "there is a continuous variation in the form of an increase-diminution-increase-diminution of the power of acting or the

focus on emotions or feelings[167] that "function beneath the threshold of conscious recognition and semantic legibility."[168] As "material, physical things" with "an energetic dimension," according to Elizabeth Bell, affects are feelings not circumscribed by language, and they are transpersonal or pre-personal intensities.[169] Affects may travel across subjects non-verbally.[170] Other work such as Sara Ahmed's, consider how emotions may shape individual and collective bodies and circulate between them in an "affective economy" of emotional currency.[171] In developing a framework for thinking the "anthropological encounter," Elizabeth Edwards uses the term affect to refer to: "a matrix of the subjectivities of experience, embodiment and emotion of all parties to the anthropological encounter — both observer and observed, as they intersect."[172] This approach allows for a thinking of affect in terms of a relational dynamic of emotions and interactions, while accounting for the historicity and politics of such dynamic.

The present research is concerned with a notion of affect that refers to a type of emotion that may or may not be circumscribed to language, but more importantly, that accounts for the transformative power of an emotion induced by qualities of the photographic document, and for a relational dynamic of affecting and being affected. Affect may then be perceived as referring to the transformative dynamic between a photographic document, the reality or subject photographed, and an observer and interpreter. Such perspective does not see such dynamic as indifferent to the historicity of detail but argues for the affective potential of the historicity of documents. I will attempt to consider a relationship between the terms affect and value, as a movement of one to the other that in turn leads to a modification in one's apprehension of the image. According to Elena Oxman, Barthes' recourse to the thematic of value is linked to that of the practice of evaluation, which leads to the emergence or creation of values. This would reveal Barthes' indebtedness to Friedrich Nietzsche and his growing scepticism with regards to scientificity, with which Barthes associated

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force of existing of someone according to the ideas which s/he has." Gilles Deleuze, "Sur Spinoza: Cours Vincennes: cours du 24 Janvier 1978," *Webdeleuze,* lecture transcript, trans. Tymothy S. Murphy. https://www.webdeleuze.com/textes/14.

[167] On the variety of theoretical work attempting to distinguish between affects and feelings, see for instance: Rei Terada, *Feeling in Theory: Emotion after the "Death of the Subject,"* (Cambridge, MA: Harvard University Press, 2001); Brian Massumi, *Parables for the Virtual: Movement, Affect, Sensation* (Durham, NC: Duke University Press, 2002); Sianne Ngai, *Ugly Feelings* (Cambridge, MA: Harvard University Press, 2005).

[168] Elizabeth Abel, "Skin, Flesh, and the Affective Wrinkles of Civil Rights Photography," *Qui Parle* 20, no. 2 (2012): 37.

[169] Abel, "Skin, Flesh, and the Affective Wrinkles of Civil Rights Photography," 37.

[170] Teresa Brennan, *The Transmission of Affect* (Ithaca, NY: Cornell University Press, 2004), 9–10.

[171] Brown and Phu, "Introduction," 6.

[172] Elizabeth Edwards, "Anthropology and photography: A long history of knowledge and affect," *Photographies* 8, no. 3 (2015): 236.

semiology.[173] Evaluation, which cannot be reduced to appreciation[174] but "signals the eruption of a point of view, a *desire,* within discourse,"[175] would constitute a practice that contrasts with semiotics, which remains on the side of the sovereignty of a will-to-know.

I will consider a certain power of a detail or of an element in the photographic documentation of work accidents, such as the body of the worker turned figure, to gain a new value, in the act of reading and writing about the image. A movement or dynamic that I will try to discuss in relation to the notion of a power of expansion of supplemental values gained by such elements and that of supplemental substitutions, in a dialogue with concepts introduced by Roland Barthes (and Jacques Derrida after him). By developing singular practices of viewing, reading, and describing the photograph, one may delineate a movement between representation, figural instabilities, affect-values, and a dynamic of supplemental substitutions occurring in the act of observing and reading the image. Furthermore, I see this affective dynamic, not as solely centred on the agency of, or as stemming from, a viewer/reader/interpreter, but as a dynamic involving the historicity of the reality photographed, photography as social practice, and subjects.

1.c. Affect-value of the figure (ii)

What is this becoming figure of a worker in the photograph the sign of? When a photograph has value of document within the practices of a powerful entity such as a mining corporation, the turning of a worker's body into an image or figure of representation may be first understood as partaking in the power of such entity to document at will in the context of the relation of subordination that binds a worker to their employer. In the context of the normalisation[176] of serious or fatal work accidents, individual or collective, i.e., when the event of death has, in a sense, become contractual[177] in the name of surplus-value, what in the photograph may contribute to or lead to a

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[173] Oxman, "Barthes and the Affect of the Visual," 73.

[174] Oxman refers to Barthes in "Languages and Style" where he warns that "evaluation cannot be reduced to appreciation." In *The Rustle of Language*, trans. Richard Howard (Berkeley: University of California Press, 1989), 119.

[175] Oxman, "Barthes and the Affect of the Visual," 81. Oxman refers to an idea expressed by Barthes in *Comment Vivre Ensemble* (Paris: Seuil, 2002), 33.

[176] See Chapter 3 for a discussion of normalisation and normalising mechanisms in relation to biopower.

[177] Républicain Lorrain, "Maladie et mort dans le contrat de travail," *Républicain Lorrain,* 4 February 2015; Le Monde/AFP, "Charbonnage de France condamné pour préjudice d'anxiété concernant 786 mineurs," *Le Monde/AFP*, 30 Juin 2016.

form of resistance from such normalisation? To what extent do representational procedures, such as deployed through photographic documentation, constitute an instance of normalising procedures?

While the intended value of the photograph of a re-enactment may be pedagogical or forensic, the "photographic reconstitution" of a work accident may however simultaneously contribute to normalising a situation of risk. For it is anchored in discursive practices that qualify work accidents as *accidental*, and that view workers as responsible of negligence and malpractice (see Chapter 1), while supporting the production of a typology. Photographic reconstitution, by way of the worker become actor, grounds the validity of the probable series of gestures or actions described in the speculative scenario *in* the image of a worker's body. The re-enactment and its photographic documentation contribute to creating a form of mythology that the enactor's body, in figuring the accident victim, helps to authenticate. The captions, apposed to the photographs, reinforce this process by referring to the worker turned actor as if they were the victim-to-be, while the use of the present tense endows the statements with a sense of truth-fulness and permanence: "*Le remblayeur est debout sur le blindé* [...]" (The coal packer is standing on top of the armoured container)[178]

However, I aim to delineate how a close reading of the photographic document endows the notion of figure with new meanings, affects or values, which are dependent upon singular reading practices. Hence *becoming figure* and *figuring the living* constitute the values that the body imaged in the photographic re-enactment has gained for me, as singular viewer/reader/interpreter. The affect of the image is thus the emergence of a new value of the figure, of the worker become figure by way of the photograph and by way of the theatricality of the re-enactment. While the intended purpose of the photograph described above is to represent a worker in the imagined context of a reconstitution, a close reading of the image endows the figure with a set of new values that in turn affect or disrupt the normative dimension of the image, i.e., its pertaining to evidentiary procedures and claims. The figure as one of the constitutive elements of the photographic signifier becomes the site of a form of instability brought about by the encounter of the document with an interpreter and the activity of reading the photographic image.

Furthermore, the activity of reading may highlight a form of decomposition of the photographic signifier into in-significant or a-signifying detail, where bearing attention to a-signifying marks may help to point to what in the photograph escapes the intentions of its maker. The practice of describing the photographic image leads one to the value of detail. The latter may be interpreted as highlighting the material determination of the photograph over that of its inscription in discursive

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[178] See Figure 47 on page 89.

practices. One's gaze may delineate a figural threshold, which language cannot designate or encapsulate without the invention of a phrase, or a neologism, or without the emergence of an image necessitating an assemblage of words. At the reach of a figural threshold, language is forced to invent or to describe. This could be where a material practice, i.e., an artistic practice, takes the relay of linguistic analysis. To account for the subversive or disjunctive dimension of certain marks, detail, or figural elements, one may develop methodologies that engage with their material attributes or material determination. The materiality of photographic documents links them to the material and political economy of the extractive-industrial complex, while it grants them a form of openness and capacity to be disseminated in new formations.[179] Artistic methodologies may engage with the finite dimension of documents in a manner that takes account of this duality.

1.d. Figuring the living and the open secret of the work accident

Re-enactment becomes the labour of figuring the living – a form of labour undertaken by the worker turned performer who embodies the accident "victim." It is probable that performer and victim may have been co-workers. However, despite its orchestration, the en-acting takes on an ambivalent dimension. Something in its image exceeds itself. I become particularly drawn to the figure's pose in photograph 2 of the sequence: hands gripping the horizontal beam; arms tensed framing the body solidly; head perpetually pointing down to a recess – the site and scene of a future that will interrupt all possible futures, for the *accidenté,* the accident victim ... Hence the *figure* directs the viewer to an invisible place, marking a radical an-economic point: that of the interruption and annihilation of a life in the process of extraction – which also coincides with the disruption of this process, for that moment, somewhere in the stratified networks of the productive machine. A point that the material and symbolic economy of the photographic surface cannot contain. The actual victim, dispossessed of their time at work while alive, now robbed of their life, while invisible, comes to irradiate the photographic image with their spectral presence.

The absent figure, the un-archived body of the accident victim, creates a disturbance in the visual field of the photograph, while forming an image without material substrate, a psychical image. Such image is endowed with a value: the force that it has of forming in one's psyche. "*La victime est décédée 13 jours après l'accident.*" The victim passed away thirteen days after the accident of a severe broncho-pneumonia due to drowning. The un-archived, spectral figure comes to invade or

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[179] See Chapter 4.

irradiate through the figure of the worker turned performer, as well as one's reading of the report and of the photographs. It creates a disturbance in the speculative causal chain presented by the sequence. It disturbs the law of consignation of "the house arrest" of the archive,[180] as it is not locatable – without material substrate, it is fleeting. It is without a domicile. An image which has no fixed form, it is mutable, it travels, migrates in a kind of metempsychosis.

Consignation, according to Jacques Derrida, aims to produce a homogeneous corpus in "a system or a synchrony" where no element should be endowed with the power to separate or partition. Derrida refers to the "secret" as that which is endowed with such a power:

> By consignation, we do not only mean, in the ordinary sense of the word, the act of assigning residence or of entrusting so as to put into reserve (to consign, to deposit), in a place and on a substrate, but here the act of consigning through *gathering together signs*. It is not only the traditional *consignatio*, that is, the written proof, but what all *consignatio* begins by presupposing. *Consignation* aims to coordinate a single corpus, in a system or a synchrony in which all the elements articulate the unity of an ideal configuration. In an archive, there should not be any absolute dissociation, any heterogeneity or secret which could separate (*secernere*), or partition, in an absolute manner. The archontic[181] principle of the archive is also a principle of consignation, that is, of gathering together.[182]

To consign, to deposit, "in a place or on a substrate," to gather together signs and all their material attributes. In this sense, the synchrony and unity that the *corporate* archive may strive for, at the time of its operations, may be subverted by certain documents in an encounter with future readers/interpreters. Heterogeneity and dis-synchronous elements may lie at the heart of its corpus, now re-configured in the form of a new entity. Here the open secret of the accident held in reserve in the apparent synchrony of the post-industrial, public, archive. An open secret, recorded and visible for all to see, partitioning the visual homeostasis of the photograph, normalised as document and instrument of veridiction. Artistic practice may allow for the dissemination of its image in novel formations[183] and give the work accident a new form of visibility and discursive agency.

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[180] The phrase is used by Jacques Derrida to describe the procedure of domiciliation of documents in the archive in which documents dwell according to a specific regime guarded by *archons*, the keepers of the archive, and of its "nomological" order, i.e., the law or logic according to which the archive is ordered. Derrida, *Archive Fever*, 2.
[181] The term "archontic" is derived from Greek: "[…] the meaning of 'archive,' its only meaning, comes to it from the Greek *arkheion*: initially a house, a domicile, an address, the residence of the superior magistrates, the *archons*, those who commanded." Derrida, *Archive Fever*, 2.
[182] Derrida, *Archive Fever*, 3. While Derrida's exposition of the etymological roots of the term archive in *Archive Fever* is of great significance for a critique of the political dimension of the archive (as institutional entity or a corpus in formation), I will not engage here with its concern with the body of works left by Freudian psychoanalysis as archive, nor with the thematic of the trace in psychoanalysis as discussed in this text.
[183] See Chapter 4 for a discussion of art practice as an infrastructuralist intervention with regards to the archive.

The concentrated stillness of the actor/worker's pose reverberates across the whole frame and each object surrounding the figure as one's gaze navigates the plane of the photograph. The orchestrated immobility of the actor's body becomes the second prevailing affect of this image. "*Le remblayeur est agenouillé sur le blindé*" (The packer is kneeling on the armoured container). The present tense of the caption, while intended to affirm a factual observational perspective or endow the photographic reconstitution with truthfulness, also comes to connote immobility, a kind of symptomatic immobility – the general value that this image has now acquired for me. While the photographic sequence claims to offer a visual aetiology or visual investigation of the accident's causes, the causal order projected by the sequence is affected by a form of disturbance. I see the three photographs, while they are intended to form a chronological sequence, as producing an uncanny juxtaposition of separate times – past, present, and future – that, *to me*, is affected by immobility.

The constative tone of the captions slowly gives way to a form of stillness that I interpret as symptomatic of a form of post-traumatic and funereal paralysis. While the body of the worker turned actor performs the labour of figuring a victim prior to their fall, one becomes increasingly aware of the dual character of this figure: the performer and the figured victim are both visible at once, transfixed together in one form. Third affect: a state of consciousness that leads one to apprehend two figures at once. The photograph becomes the scene of this excess. In the mournful pedagogy of the re-enactment, one finds a double image of alienation: that of the victims, speculatively represented, incorporated with that of the workers turned performers who are not represented as such, in the toil of the labour that they are normally contracted to do, but whose performances and images constitute figures of representation for the corporation. In a sense, the other suppressed reality here, is the risk-fraught conditions which the workers turned re-enactors are exposed to for the labour of performatively representing co-workers who were killed in circumstances that they themselves experienced daily: in the photographic reconstitution they rehearse their own possible future exposure to injury or death.[184]

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[184] Due to the high frequency of the occurrence of work accidents in HBL, and to the dangers associated with undertaking any form of tasks underground, one can only assume that the workers performing accident re-enactments were trained to the dangers of the mine, i.e., employed as miners. Such types of files were produced to be circulated internally in HBL and were published by the company's own communication services.

2 – The worker as figure and the extra-photographic body

2.a. Supplemental values of the (worker's) figure

> "Whatever it grants to vision and whatever its manner, a photograph is always invisible: it is not it that we see." [185]

> "However lightning-like it may be, the *punctum* has, more or less potentially, a power of expansion. This power is often metonymic. […] There is another (less Proustian) expansion of the *punctum*: when paradoxically, while remaining a 'detail,' it fills the whole picture." [186]

How to best qualify the process by which one (a body) becomes other (a figure or imaged body) in the photographic image, and by extension, in the document? And how does this process of *differentiation* become obscured in the reception of such an image? By what power does the viewer confuse the same with what *resembles* the same, i.e., the entity or body photographed with its image? While the photograph's iconicity, its resemblance to the reality photographed that it refers to, sustains the photograph's referential power and evidentiary dimension [187] (one is drawn to see the imaged reality or imaged referent, not the photograph that constitutes its substrate), the power of expansion[188] of something referred to as *punctum* by Roland Barthes, also qualified of a virtual force by Jacques Derrida,[189] may be a starting point for thinking the capacity of a quality in a detail or a figural element to expand to the entire plane of the photograph, or even across a sequence or a corpus of photographs. Such as the orchestrated stillness of the worker turned performer discussed previously. To thematise elements of the photograph that evade signification, Barthes, in *Camera Lucida* (1980), develops the notion of *punctum*, as the potential of a detail to subvert a viewer's cultivated engagement with a photograph, or *studium,* and to transform how a viewer may *see* and *value* such photograph. This is referred to as resulting from the *punctum*'s power of expansion. The

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[185] Barthes, *CL*, 6.
[186] Barthes, *CL*, 45.
[187] We are reminded by Mary Ann Doane that in Charles Sanders Pierce's taxonomy of signs, indexical signs of the order of the trace, such as the footprint, the death mask, the photograph, partake of the iconic as the sign resembles the object it refers to. While linguistic indexical signs such as "this," "I," "here" (called shifters) partake of the symbolic (as the sign stands in place of its referent without any resemblance to it). "In both these instances [the trace and the shifter], the index is defined by a physical, material connection to its object. In its iconicity, the index as trace has, unfortunately, suggested for many theorists an alliance with realism as both style and ideology." In Doane, "Indexicality: trace and sign: Introduction," 2.
[188] Barthes, *CL*, 45.
[189] Jacques Derrida, "Les morts de Roland Barthes," *Poétique* 47 (1981): 286.

possibility of a dynamic of varying *values* of the (worker's) figure, as described in the previous section, may be discussed, in relation to such thematic.

Furthermore, one proposes that the idea of a power of expansion of the *punctum* may be revisited through a notion of affect that engages with the emergence of new values (of the photographic document for the viewer) and which allows for the idea of a dynamic between the photograph, the imaged subject or reality, and the viewer. A notion of an affective dynamic that may integrate the materiality of the photograph, the historicity of the observed and of the reality photographed, and the affective intentionality or capacity of the viewer, reader, interpreter. An affective dynamic inscribed in the relational economy of photography, which includes the historical inscription of photography (as considered in this research) in the regime of extraction and its future insertion in new formations produced in the context of art practice.

Barthes develops the thematic pair of the *punctum* and the *studium* in *Camera Lucida* (1980), where the *studium* is defined as the application of a "sovereign consciousness" to the photographic image in "a kind of general, enthusiastic commitment, without special acuity."[190] It corresponds to the realm of "*average* affect"[191] and inconsequential taste, resulting from a certain form of training, or education.[192] The activity of the *studium* is that of "the docile cultural subject,"[193] it is conditioned by cultural codes, i.e., by a viewer's participation in "an ethical and political culture."[194] Hence: "The *studium* is always ultimately coded, the *punctum* is not."[195] The practice of semiology would be the practice of decoding the cultural or ideological underpinnings of the *studium*, a form of discursive analysis based on methods derived from linguistics.[196] According to Barthes, the element that breaks, tears up, or punctuates the *studium*, is referred to as the *punctum*. It is that which lacerates the field of the *studium*, akin to a wound or a piercing action: "it is the element which rises from the scene, shoots out of it like an arrow, and pierces me."[197] The *punctum* is associated with the capacity of a detail to disturb or subvert the "*average* affect" of cultivated interest, and when encountered in a photograph it refers to the capacity of a detail to draw the viewer in and to make them see the

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[190] Barthes, *CL*, 26.
[191] A form of emotion associated with a general form of interest in the photograph: "[t]he studium is that very wide field of unconcerned desire, of various interest, of inconsequential taste: *I like / I don't like*." Barthes, *CL*, 27.
[192] Barthes, *CL,* 26.
[193] Barthes, *CL,* 43.
[194] Barthes, *CL,* 26.
[195] Barthes, *CL,* 51.
[196] See for instance: Barthes, "The Third Meaning," In *Image Music Text*, 52-68; or "The Rhetoric of the Image," In *Image Music Text*, 32–51.
[197] Barthes, *CL*, p. 26.

photograph anew, of marking one's vision, with the effect of endowing the image with a new, higher, value:

> [...] occasionally (but alas all too rarely) a "detail" attracts me. I feel that its mere presence changes my reading, that I am looking at a new photograph, marked in my eyes with a higher value. This "detail" is the *punctum.*[198]

The relation of *studium* to *punctum* is one of co-presence, and while the detail that opens up the field of the *punctum* is linked to a historical context, from the point of the view of the reader it is "offered by chance:"

> It is not possible to posit a rule of connection between the *studium* and the *punctum* (when it happens to be there). It is a matter of a co-presence, that is all one can say [...] a whole causality explains the presence of the "detail": the Church implanted in these Latin American countries, the nuns allowed to circulate as nurses, etc.; but from my Spectator's viewpoint, the detail is offered by chance and for nothing; [...]"[199]

Elsewhere, the *punctum* is referred to as a supplement:

> [..] the detail which interests me is not, or at least is not strictly, intentional, and probably must not be so; it occurs in the field of the photographed thing like a supplement that is at once inevitable and delightful [..] [200]

Recall that supplemental meaning in "The Third Meaning" was defined as meaning that cannot be grasped by intellection. The notion of meaning is no longer alluded to here but replaced by that of affect considered as a form of power: "my phenomenology agreed to compromise with a power, affect; affect was what I didn't want to reduce; being irreducible, [...]"[201]

While the *punctum*, which translates "a value of the word detail,"[202] may be taken to exist in a relation of opposition to the *studium,* according to Jacques Derrida, *studium* and *punctum* compose with each other in a non-dialectical or non-oppositional manner. The two fields "compose with each other, the one *with* the other" and are bound by a relation that Derrida qualifies of supplemental. The *punctum* is described by Derrida as inhabiting the field of the photograph in a form of haunting:

> [...] the 'subtle beyond' of the *punctum*, the uncoded beyond, composes with the 'always coded' of the *studium* [...]. It belongs to it without belonging to it and is unlocatable within it; it is never inscribed in the homogeneous objectivity of the framed space, but instead inhabits or, rather, haunts it: "it is an addition [*supplément*]: it is what I add to the photograph and *what is none the less already there*" [...][203]

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[198] Barthes, *CL,* p. 42.

[199] The examples given by Barthes refer to a photograph taken by Koen Wessing in Nicaragua in 1979. Barthes, *CL,* 42.

[200] Barthes, *CL,* 47.

[201] Barthes, *CL,* 20-21.

[202] Jacques Derrida, "The Deaths of Roland Barthes," in *Psyche: Invention of the Other, vol. I,* ed. Peggy Kamuf and Elizabeth Rottenberg (Stanford: Stanford UP, 2007), 279.

[203] Derrida, "The Deaths of Roland Barthes," 271.

Derrida qualifies this character of the *punctum* of being unlocatable, yet inhabiting "the framed space," of belonging to the field of the *studium* while being different from it, of being added while being *already there,* as spectral. According to Derrida, the spectral is the character of what escapes dialectical logic. It is the character of being simultaneously present (in a detail) and absent (unlocatable, added), at once physical and metaphysical, or it is that which destabilises this dichotomy. Derrida omits to quote the rest of Barthes' statement, which emphasizes the paradox of the *punctum* of being added *by the viewer* in a singular manner while already contained in the image, as well as highlighting the banality, everydayness, or prosaic dimension of the detail that may trigger it:

> [...]whether or not it is triggered it is an addition (*un supplément*): it is what I add to the photograph and what is nonetheless already there [...] what I add--and what, of course, is already in the image – is the collar, the bandage.[204]

By contrast to Derrida's interpretation, Barthes' statement emphasises the agency of a viewer ("what I add") and their receptivity to detail. While the concept of the spectral may be a *logically* suitable solution to thinking the paradoxical or non-dialectical ontology of the *punctum*, what does one make of Barthes' logic-defying statement, or provocation? Is it simply the product of a literary experiment? Rather than expressing the event of the *punctum* as an *addition*, should one not discuss it from the perspective of a *relation*, or of a *relational dynamic* between what is already there, the reality imaged, the detail and its material attributes (and more broadly the document), and the viewer, whose reading of the image is transformed in the process?

One may say that Derrida's interpretation appears to divorce the *punctum*, or the affect of detail, from the agency or affective capacity of an interpreter/viewer/reader. The *punctum* as designating the realm of the spectre seems somehow disconnected from the realm of experience. Derrida's spectral ontology of the *punctum* appears disembodied, while it seems to treat both the *punctum* and "affects" as pre-existing realities:

> As soon as *it allows itself* to be drawn into a network of substitutions, it [the *punctum*] can invade everything, objects as well as affects." [205] (My emphasis)

Instead, I propose to problematise the relational dimension of a given detail to an interpreter, viewer, or reader, as a form of dynamic, in a manner that takes account of the materiality and historicity of detail. Furthermore, one may take Barthes' following statement as pointing to the problem of the historicity of detail and that of the suppression of a possible link between the latter and the emergence of a *punctum*:

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[204] The details refer to a photograph of two disabled children taken by Lewis Hine in 1924, see Barthes, *CL,* 50-51.
[205] Derrida, "The Deaths of Roland Barthes," 288.

the detail which interests me is not, or at least is not strictly, intentional, and probably must not be so; it occurs in the field of the photographed thing *like* a supplement that is at once inevitable and delightful; it does not necessarily attest to the photographer's art; *it says only that the photographer was there*, or else, still more simply, *that [s]he could not not photograph the partial object at the same time as the total object* [...][206] (My emphasis)

Hence the fact that *"from [the] Spectator's viewpoint, the detail is offered by chance and for nothing; [...]"*[207] may not occlude the possibility of a link between the historicity of detail ("a whole causality explains the presence of the 'detail'") and the emergence of an affect and new value of the photograph for *some* viewers. Furthermore, one may refute that the process of the subversion or partition of the field of the *studium*, and of a relational, affective dynamic of a viewer to photographic detail, should be denied any form of historicity. Hence one may argue for a politics of the affect of detail, and a politics of being affected by detail in the photograph. The present research does not see the question of affect as divorced from a materialist interpretation of the photograph which may help re-frame the problem of detail that escapes a culturally coded or culturally determined *studium*, through the question of the material and historical determination of the photographic image. Hence, detail that would be undetermined by the "art" of the photographer whilst also escaping the sovereign consciousness of an interpreter, ought to be understood as the very mark of a photographic document's materiality and historicity. A detail will always be the mark of a photograph's inscription in a system of material, historical relations, as well as that of the reality or subject documented, and that of the photographer.

Hence the affect as supplement that transforms the value of an image for the viewer and possibly a community of viewers, may be connected to another form of supplement, that may be qualified of *historical-political*. Ariella Azoulay in *The Civil Contract of Photography* (2008) refers to another form of supplement of the photograph, that may be interpreted as *historical*.[208] In an inversion of one of Barthes' phrases, Azoulay remarks:

> The photograph always includes a supplement that makes it possible to show that what "was there" wasn't there *necessarily* in that way.[209]

While Barthes' statement alluded to here describes the photographic referent as *necessarily* real by distinction to other forms of referent, such as the linguistic referent,[210] Azoulay points to the wider

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[206] Barthes, *CL*, 47.

[207] The examples given by Barthes refer to a photograph taken by Koen Wessing in Nicaragua in 1979. Barthes, *CL,* 42.

[208] John Roberts, *Photography and its Violations* (New York: Columbia University Press, 2014), 10.

[209] Ariella Azoulay, *The Civil Contract of Photography* (New York: Zone Books/MIT, 2008), 94.

[210] "[...] Photography's Referent is not the same as the referent of other systems of representation. I call 'photographic referent' not the *optionally* real thing to which an image or a sign refers but the *necessarily* real thing which has been placed before the lens, without which there would be no photograph." Barthes, *CL,* 76.

historicity of the referent, which the photograph as social production, may obscure or distort.

According to Azoulay, in its active life, the photograph[211] is caught in a web of actions and relations

beyond the space of contemplation created by the photograph naturalised as image. One ought to

therefore account for the political ontology of photography, whereby subjects photographed,

photographers, the camera, photographs, and viewers are inscribed in a network of relations of a

political dimension.[212] In response to the notion of supplement referred to by Azoulay, John Roberts

declares: "this supplement is, essentially, the historical space left by what the photographer,

photographed, and extant spectator cannot know or predict at the point of the photograph's

production and initial reception."[213] This research proposes to consider two forms of supplements, as

correlated: one affective, the other historical and political. Hence, it invites to draw connections

between the political ontology of photography, the political economy of extraction[214] and the

question of an affective dynamic between photographed subjects, photography as practice, and

viewers. If significantly, in Barthes' exposition, the power of expansion of the *punctum*, results in the

transformation of a photograph's value for the viewer,[215] one may argue that the emergence of this

affect-value may lead to the transformation of one's understanding of the politics in which the

photograph may be inscribed. Hence, affect would lead to new values, new values to the historical-

political supplement, and to critique.

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[211] In a passage inspired by Hannah Arendt, Azoulay states: "although photography may appear to be a distinctive object of the contemplative life (vita contemplativa), a moment in which all movements have been eliminated, it is actually deeply embedded in the active life (vita activa); it attests to action and continues to take part in it, always engaged in an ongoing present that challenges the very distinction between contemplation and action." Azoulay, *The Civil Contract of Photography,* 94.

[212] Azoulay's "citizenry of photography" refers to the idea of a community of actants (photographed, photographers, observers) unmediated by the sovereign power of a state, but by taking part in the social practice of photography. Azoulay, *The Civil Contract of Photography,* 97. The political ontology of photography is further developed in *Civil Imagination* (2021)*:* "My intention here is not to lay out an ontology of the political per se. It is, rather, to delineate the political ontology of photography. By this I mean an ontology of a certain form of human being-with-others in which the camera or the photograph are implicated." And "[t]he photograph is a platform upon which traces from the encounter between those present in the situation of photography are inscribed, whether the participants are present by choice, through force, knowingly, indifferently, as a result of being overlooked or as a consequence of deceit." In Ariella Azoulay, *Civil Imagination: A Political Ontology of Photography*, trans. Louise Bethlehem (London; New York: Verso, 2012) 18 and 24.

[213] "That is, photography establishes a constellation of places between photographer, photographed, and spectator (immediate and futural) that is never stable temporally, in the sense that the image is never "possessed" by the photographer, photographed, or spectator (what I shall call here the various actants of the photograph)." Roberts, *Photography and its Violations*, 6.

[214] While Azoulay's work is crucial in highlighting the relational ontology of photography, as pointed out by Roberts, her political ontology does not engage with the question of political economy. See Roberts, *Photography and its Violations*, 10.

[215] Barthes, *CL,* 42.

2.b. The extra-photographic real

While the term referent has been employed by Barthes to qualify the photographed reality throughout his writings, in the field of linguistics it is generally defined as the *extra-linguistic* entity to which the linguistic sign refers the reader to:

> Referent: Object or state of affairs in extralinguistic reality or also a linguistic element to which the speaker or writer is referring by using a linguistic sign.[216]

> Referent: That to which the linguistic sign refers to (*renvoie*) either in extra-linguistic reality or real world, or in an imaginary world. (My translation)[217]

Hence, while the photograph has been referred to by Barthes as the photographic signifier, its referent, the entity or reality the photograph refers one to, may be thought of as belonging to *extra-photographic* reality. In the case of the documentation of the work accidents studied, the event of the photograph never coincides with that of the accident since the photograph is produced in its aftermath, or in the contexts of re-enactments or simulations (of the technical and material conditions leading to an accident).[218] In the re-enactment or accident reconstitution (extra-photographic) reality itself constitutes a form of representation before it is photographed. The extra-photographic reality referred to can only be speculatively represented. The orchestrated scene constitutes a kind of figural representation even before being photographed, while the topography of the accident becomes its stage. As discussed in the previous section, the accident victim, figured by the worker turned performer, is the absent figure which constitutes a partition within the visual, and leads to the haunting of a visible figure by an invisible figure. In the re-enactment, the accident as event is always that which is outside of the frame, as the referent that is not captured but simulated, or figured, in a fragmented way. It is an invisible outside haunting the field of the image. The photograph itself becomes a figure. The figure for a photograph that could not or was not taken, haunted by the virtual photograph of a real that could only be experienced by the accident victim.

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[216] Hadumod Bussmann et al., *Routledge Dictionary of language and linguistics* (London & New York: Routledge, 1996), 990.

[217] "Référent: Ce à quoi le signe linguistique renvoie soit dans la réalité extra-linguistique ou univers réel, soit dans un univers imaginaire." See *Centre National des Resources Textuelles et Lexicales* (CNRTL), 2012. http://www.cnrtl.fr/definition/referent.

[218] There is no information available in the dossiers considered to confirm whether all accident sites were photographed or not. If mining accidents led to judicial enquiries there is a restriction on access to archival documents of 50 years. Furthermore, in instances of very severe collective 'catastrophes,' the conditions of access to the site in the direct aftermath of accidents would simply have been too hazardous for any kind of photographic intervention. On conditions of communicability of archival documents see: France Archives, "Les délais de communicabilité prévus par le code du patrimoine," *France Archives* (portal of the French National Archives), 7 March 2022, https://francearchives.fr/fr/article/26287562.

While the referent designated by a linguistic sign may be an entity that is real or imaginary, the same linguistic sign can refer to a plurality or even an infinite number of entities that can be designated by it. The photographic signifier (when the result of a recording or documenting), however, is bound to the entity it refers to by a relation of unicity. The photograph can only refer to a unique referent to which it is bound materially and for which the photograph becomes "a certificate of presence."[219] Inversely, without the *having been there* of the referent, a photograph would not exist. The photographic referent is therefore what is "necessarily real" (for a photograph to exist): "I call 'photographic referent' not the *optionally* real thing to which an image or sign refers but the *necessarily* real thing which has been placed before the lens, without which there would be no photograph."[220] This was described by Barthes as the adherence of the referent to its signifier. And the adherence of the referent to its signifier results in a substitution, whereby what is visible, as it were *at first sight*, is the (imaged) referent – not the photograph as object and its material attributes:

> Whatever it grants to vision and whatever its manner, a photograph is always invisible: it is not it that we see. [..] In short, the referent adheres. And this singular adherence makes it very difficult to focus on photography.[221]

Hence, the adherence of the referent to the photographic signifier comes to obscure the process by which one may become a figure on its surface. Furthermore, what also comes to be obscured is the material determination of the photographic signifier. Its finitude. What constitutes it as sign and object. And ultimately its inscription in a material and political economy and a network of relations (see Chapters 3 and 4).

In the case of the work accident (in the context of extraction considered), there is a disturbance in the relationship of the photograph to its referent, as the "*necessarily* real" (the event of the accident in its actuality) can never be the visible or imaged referent. Hence the accident while still constituting the "*necessarily* real," is a referent in the second degree. It is necessarily real but constitutes a *lack* in the visible surface. In the case of an aftermath image, the necessarily real is *visibly absent* of the scene photographed. In such images, while the space photographed refers to the accident, as it bears its marks, the photograph seems to be caught in an act of pure denotation. According to Barthes the site of pure denotation, if at all possible, would be the traumatic image:

> If such a denotation exists, it is perhaps not at the level of what ordinary language calls the insignificant, the neutral, the objective, but, on the contrary, at the level of absolutely traumatic images. The trauma is a suspension of language, a blocking of meaning.[222]

[219] Barthes, *CL,* 87.
[220] Barthes, *CL,* 76.
[221] Barthes, *CL,* 6.
[222] Barthes, "The Photographic Message," in *Image Music Text*, 30.

While a photographic document may be linked to catastrophe (on an individual or collective scale) and trauma, it may not necessarily be qualified as a traumatic image. In the instance of a work accident the instant of its occurrence remains invisible, un-archived. The traumatic event is not visible and there is no possible (visual) return to the origin of trauma.

However, each photographic document in the heterogeneous archive of work accidents bears the reverberation of a threat, even in photographs that are seemingly not directly related to *historical* accidents, as if there were a displaced form of trauma linked to the generalisation of the regulation of risk. Hence the effects of series of traumatic events, as well as those of the continuously looming possibility of a threat to workers' lives, become generalised and reverberate across a vast set of archival documents, as if through a form of potentiality. This process can be thought of in terms of a generalised concept of the *punctum*, an affect that expands across a territory of documents. Further, one could think the transmutation of the value of figural elements when reading the image with regards to this power of expansion across a corpus. For instance, across the photographic re-enactments dispersed among accident analyses files, the documented figures of workers turned re-enactors become endowed with a similar funereal, symptomatic immobility and duality, and acquire the value of a trope. In each instance, one's apprehension becomes invaded by the absent figures of the *accidentés,* and each time, the photographic reconstitution becomes a double image of alienation (of the victim, and of the re-enactor).

Photo 1

Photo 2

Figure 48. Photographer unknown, "Untitled [re-enactment of fatal accident 13/60]," c. 1960.
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.
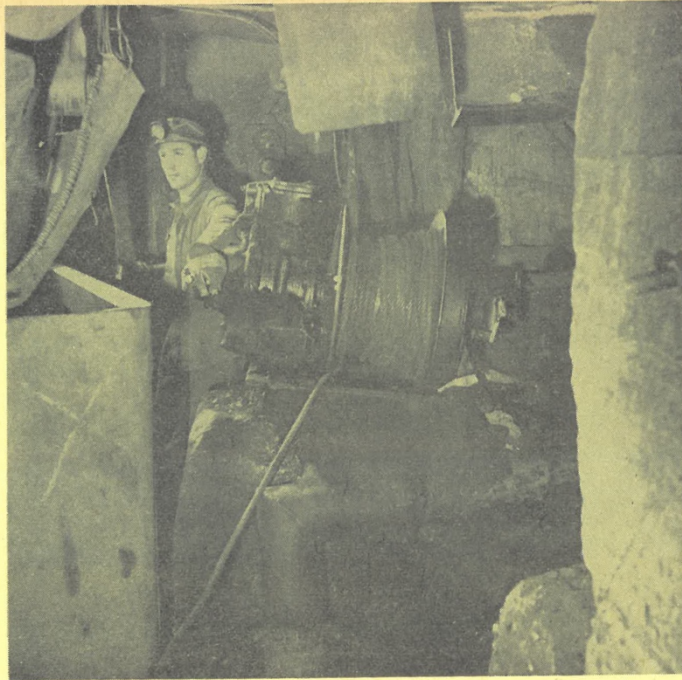
Reconstitution phase 1

Reconstitution phase 2

Reconstitution phase 3

Figure 49. Photographer unknown, "Untitled [re-enactment of fatal accident 1/60]," c. 1960.
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

3 – Supplemental transgressions: affect-value of the figure (iii)

A body is partially immersed in a large volume of liquid of which the very dense nature and dark colour or tone are quickly apparent. The volume of liquid occupies a recess; an onlooker's boots standing on a platform above the level of its surface are visible to the left-hand corner of the scene. When I summon the fourth photograph inserted in the analysis of incident "III – E. 532 (4)" out of memory, I recall the liquid surface to be covering the body in such a way that it seems divided in two. I imagine a figure isolated in the expanse of liquid and that the scene photographed lacks a background as if engulfed in an expanse of darkness. Both impressions alternate in my capacity to visualise the scene by memory. The alternation of two versions of the imagined scene produces a plurality of versions of the scene in my mind where a perception forms a mixture with imagined visual elements, before the act of an interpretation leads to a critical reading.

While summoning the remembered photograph, I notice that I have conjured up a more general image – smoothed out of details but shaped or structured by particular affects: that associated with the immersion of the body suggesting the latter's fragmenting, and that of an engulfing expanse. I quickly then recall several other photographs documenting or representing a series of acts that typify the evacuation of injured bodies or attempts at resuscitation. Here a body is cocooned in a soft stretcher designed by specialised technical teams to suit the environment of underground mining. There a sequence describes a procedure to use stretchers for the evacuation of victims. Other remembered images relate to the application of resuscitation techniques in marketing materials gathered by the health and safety department. I recall learning of the normalisation of various safety protocols as a slow process (technical, administrative, and cultural) and noticing the occurrence of the term "normalisation" in various documents. I juxtapose types of images that do not seem to be directly connected but by doing so I develop an order of relation differing from their current archival consignation.[223]

When I return to the photograph and the accident file, I observe that the upper part of the model's body is more prominently emerging out of the liquid surface, while legs are fully submerged, and only the tip of the boots are visible. There is a form of rigidity in the model's composure and his

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[223] Allan Sekula refers to the archive as to a "quantitative ensemble of images" which constructs "imaginary economies" thus underlining imaginary procedures at work before and through the intervention of a reader. See Allan Sekula, "Photography between Labour and Capital," in *Mining Photographs and Other Pictures, Photographs by Leslie Shedden*, eds. Benjamin Buchloh and Robert Wilkie (Halifax: Press of the Nova Scotia College of Art and Design, 1983), 194.

facial expression, while his gaze gains an ambivalent value for me. The worker's eyes are pointing to a space beyond the limits of the photographic frame. A space located above and ahead of the figure but left un-photographed. Furthermore, his gaze draws me to consider what one may refer to as a psychological space, that of the intimacy of the worker/re-enactor's mind, to which I have no access. What I imagine to be a mixture of chemical traces and dust, forms spiralling shapes across the liquid surface, and across the worker's body. The worker's performance aims to satisfy the evidentiary logic of the orchestrated, re-enacted scene as well as the pedagogical dimension of the report. In the composed stillness of his body, the worker demonstrates the usefulness of a lifejacket.

Under scrutiny the photograph fails to remain a homogenous surface. The photograph then appears to constitute a kind of stratum which seems to gain more depth as other photographs are encountered and become associated with it in my mind. A network of images starts to form. Images that echo one another. One's own archival re-configuration takes shape in the attempt to visualise an ensemble. In order to form a network of connected images, or an image-as-network. Hence while I can see an image as a singular entity, I can also see its content *in relation to* or *through* other images. I start to perceive the heterogeneous corpus of photographs as a stratified ensemble.[224] Upon reading the full accident analysis, I learn that the fourth photograph included in the accident file is purely speculative. For it illustrates what might have happened if the victim would have worn a lifejacket. It also gains a more generalised value as the figure of the worker points to any possible worker in the future. While the instrumental aesthetic of pedagogy uses the performative disciplines of the body assembled with technical objects, it however opens up the path to a transgression to signification.

While the evidentiary use-value of this image is further affirmed by textual information (its anchorage), the composed rigidity of the photographed model, its ambivalence, and that of the model's gaze, gain an affective persistence. Soon the juxtaposition of the text and the image becomes the source of a disturbance in the order of evidence and opens up the function of evidence to a form of logical failure or a form of absurdity. The caption to the fourth image, "*le gilet de sauvetage type Racer*" (the Racer lifejacket) seems more and more disconnected from the photograph. The spatial gaps between words acquire growing significance, while the absence of a verb, and that of a complement become increasingly noticeable. While the caption is supposed to give context to the photograph, there is a jarring disjunction between the caption which simply designates an object (almost in the manner of an advertising slogan), and the funereal quality of the photographed scene.

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[224] This may be discussed in relation to the dispostival inscription of photography in the material and infrastructural ecology of the industrial-extractive complex (see Chapters 3 and 4).

The ambivalent corporeal rigidity of the figure becomes, *for me*, the excessive element that transgresses or disturbs the evidentiary use-value of the "*reconstitution photographique.*" The site where the antithetical signifieds, living/dead, now coincide.
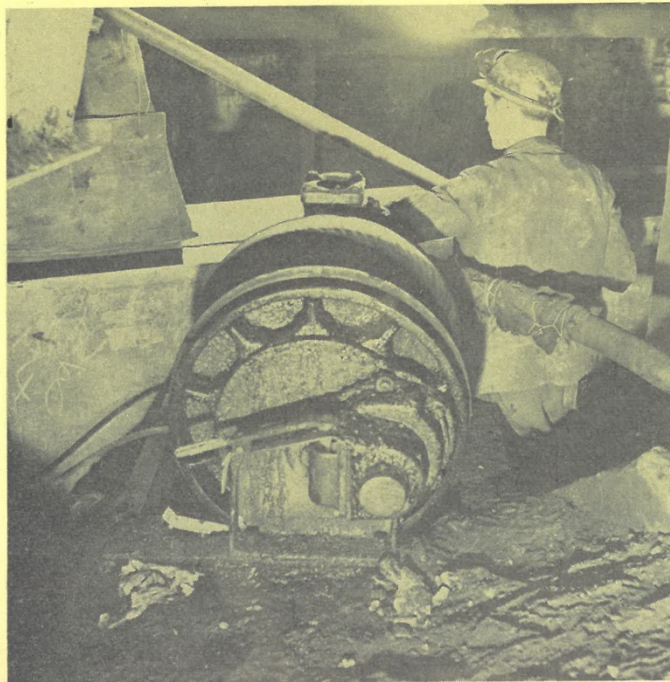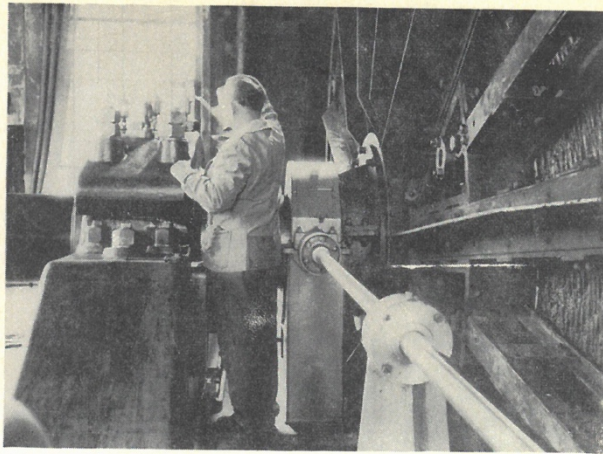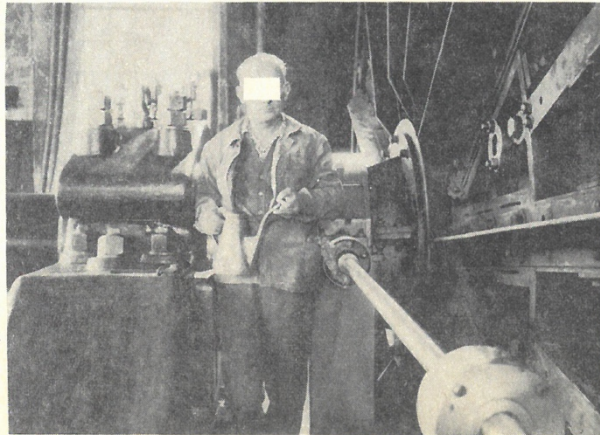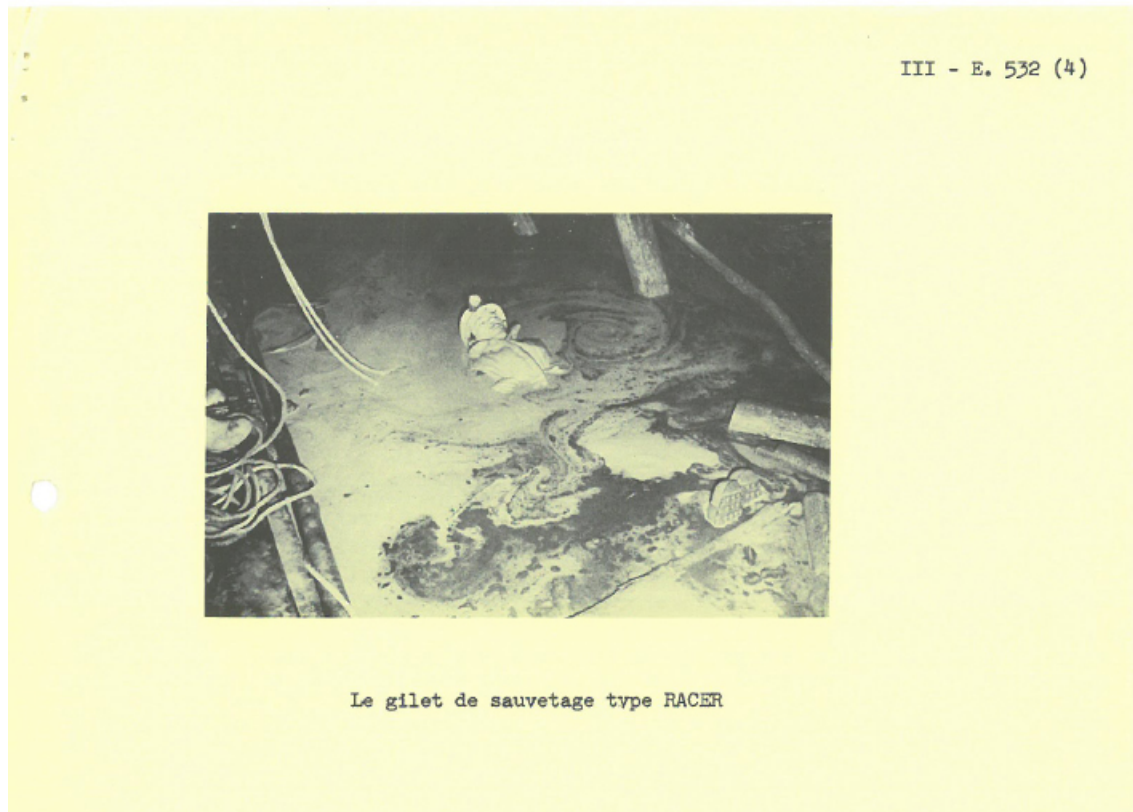

Figure 50. Photographer unknown, "Untitled [Fatal accident 6/68]," c. 1968.
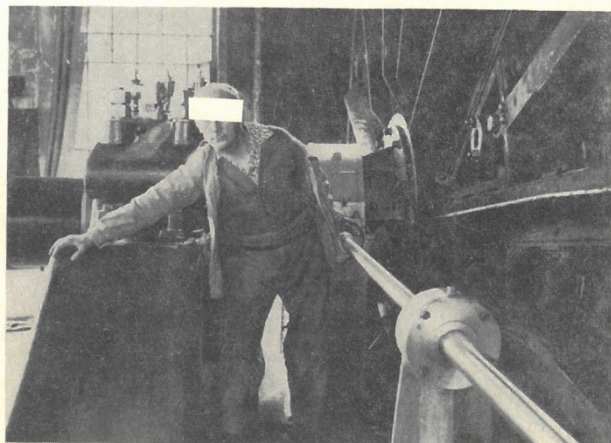Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.
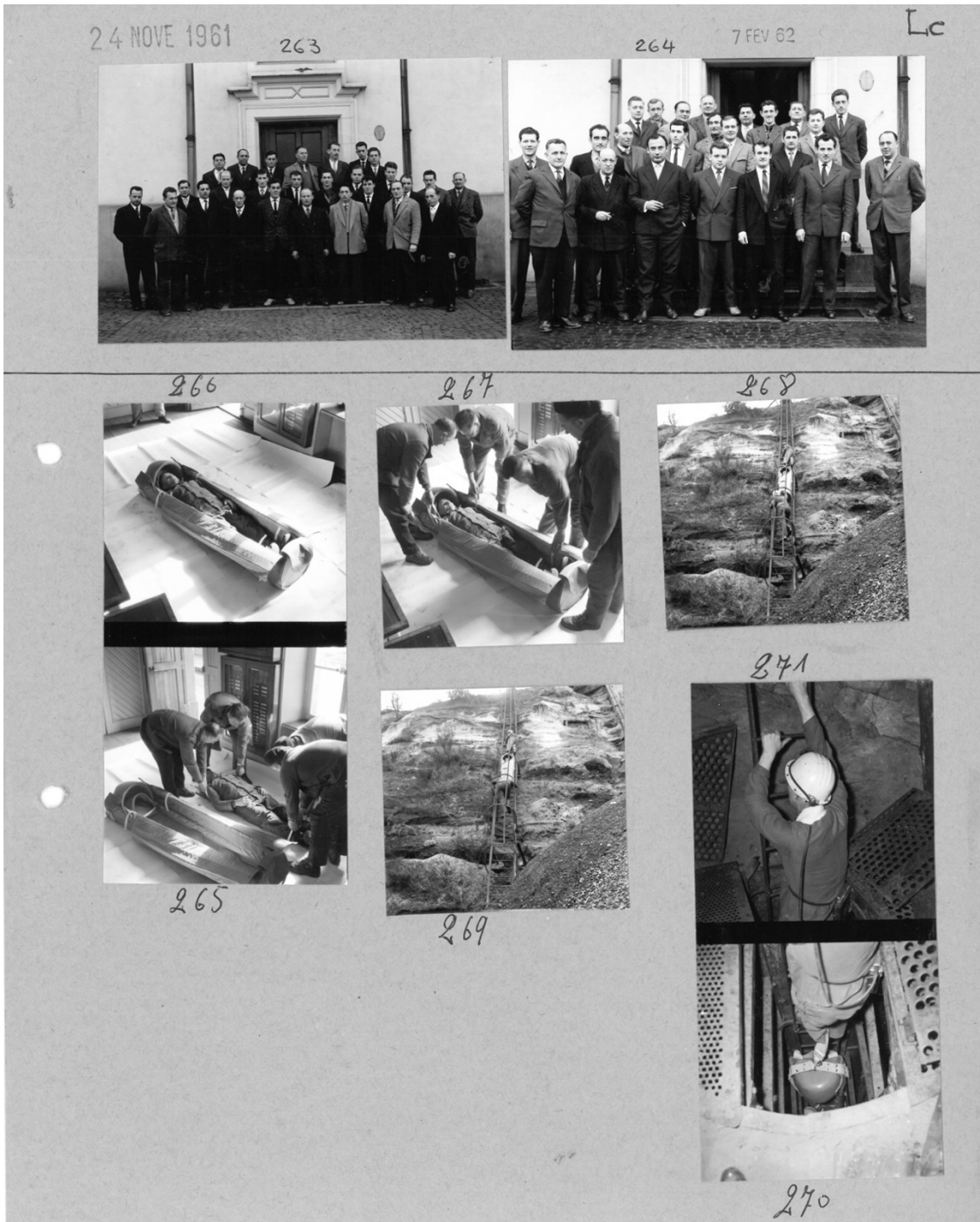
Figure 51. Photographer unknown, "Untitled," c. 1962. Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.
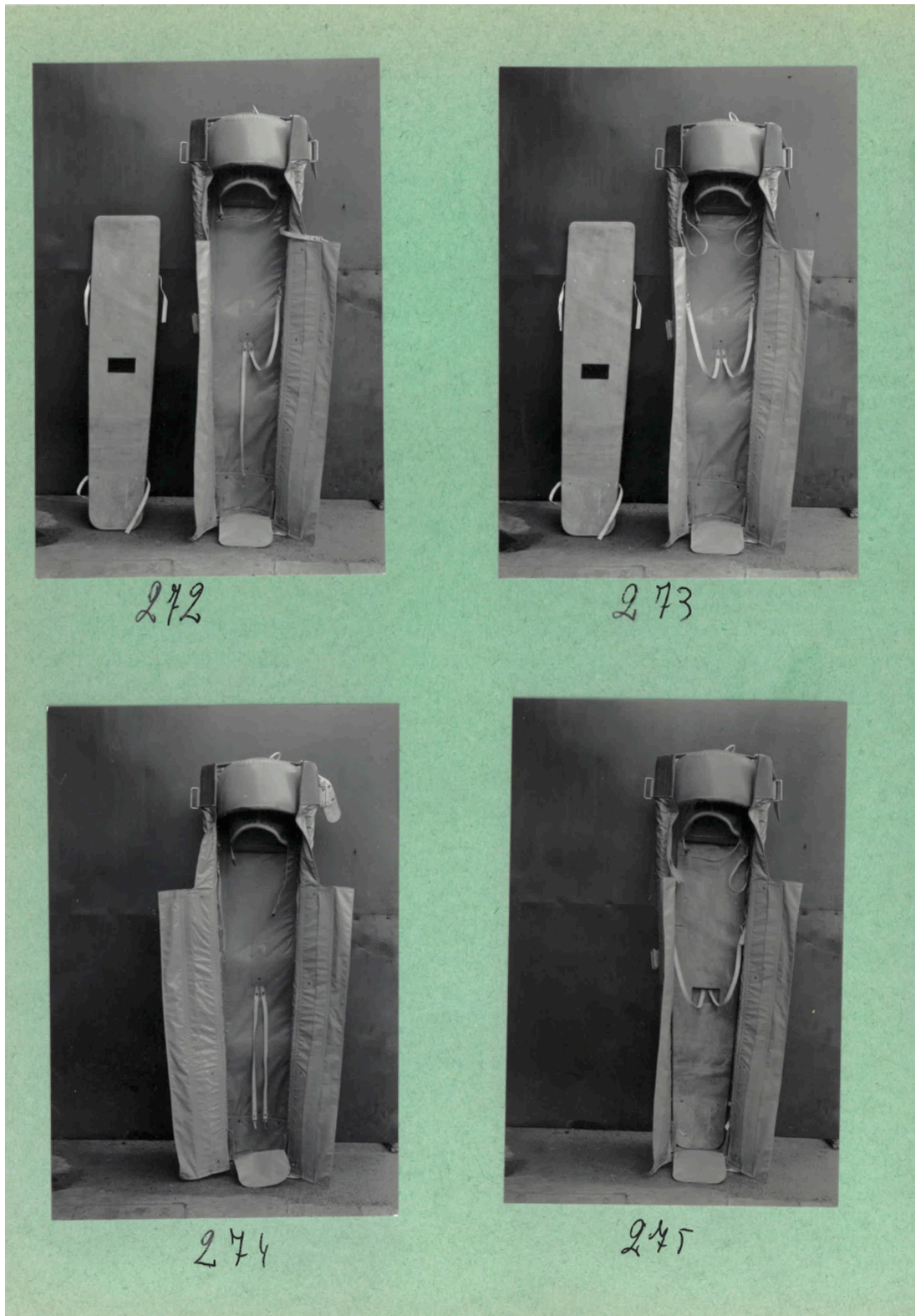
Figure 52. Photographer unknown. "Sac de cheminée," (Rescue stretcher), n.d.[225]
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[225] From a letter I surmise that soft stretcher were designed by the mining corporation HBL to become a normalised and standardized form of rescue equipment suited to underground mining.

[REDACTED]
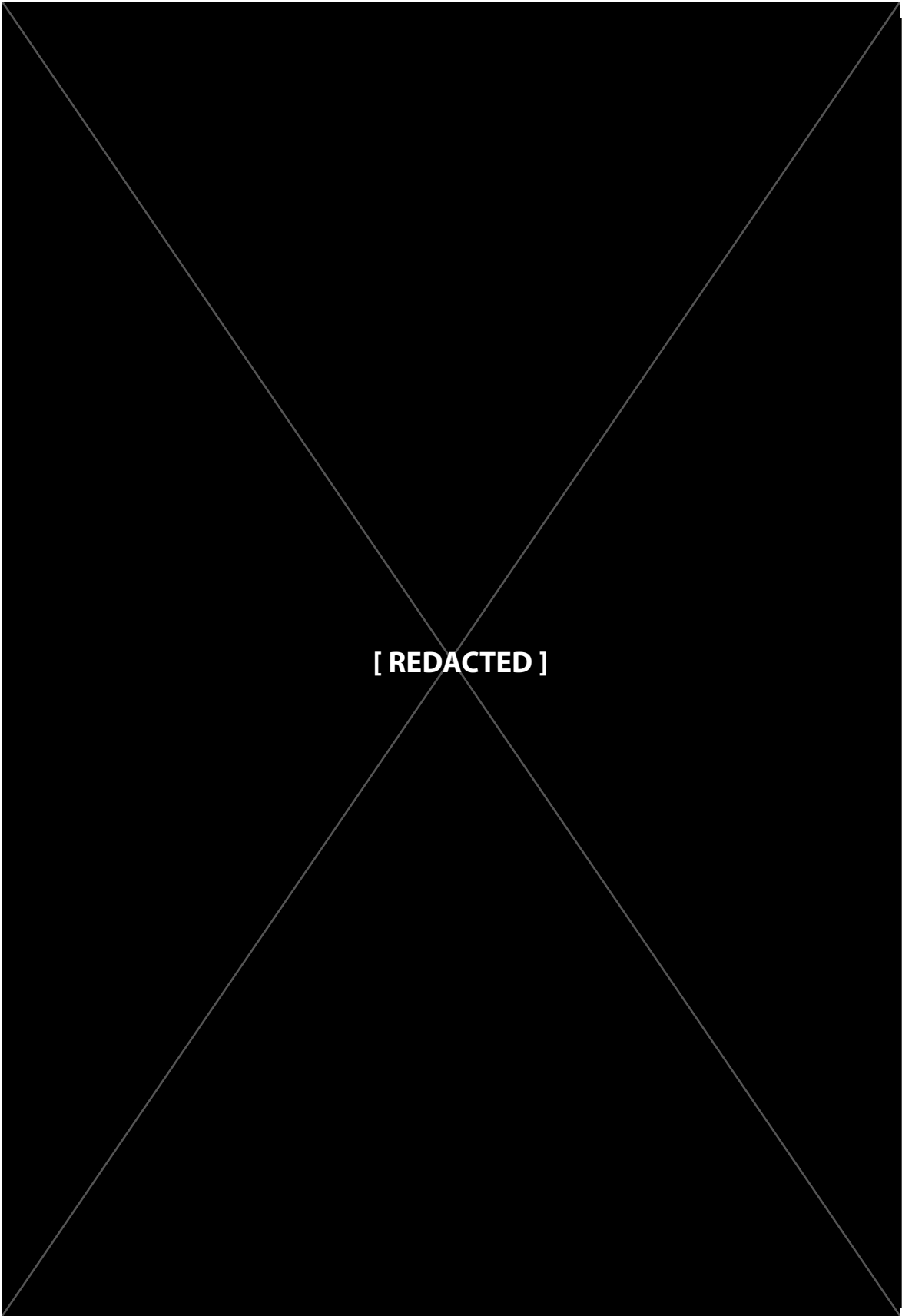
Figure 53. Artist unknown. "Untitled," n.d. Instruction leaflet for a breathing apparatus designed by Commeinhes S. A., Saint-Maur, France.

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Chapter 3

The Work Accident as Event:

Historicity and/of the Accident, and Biopower
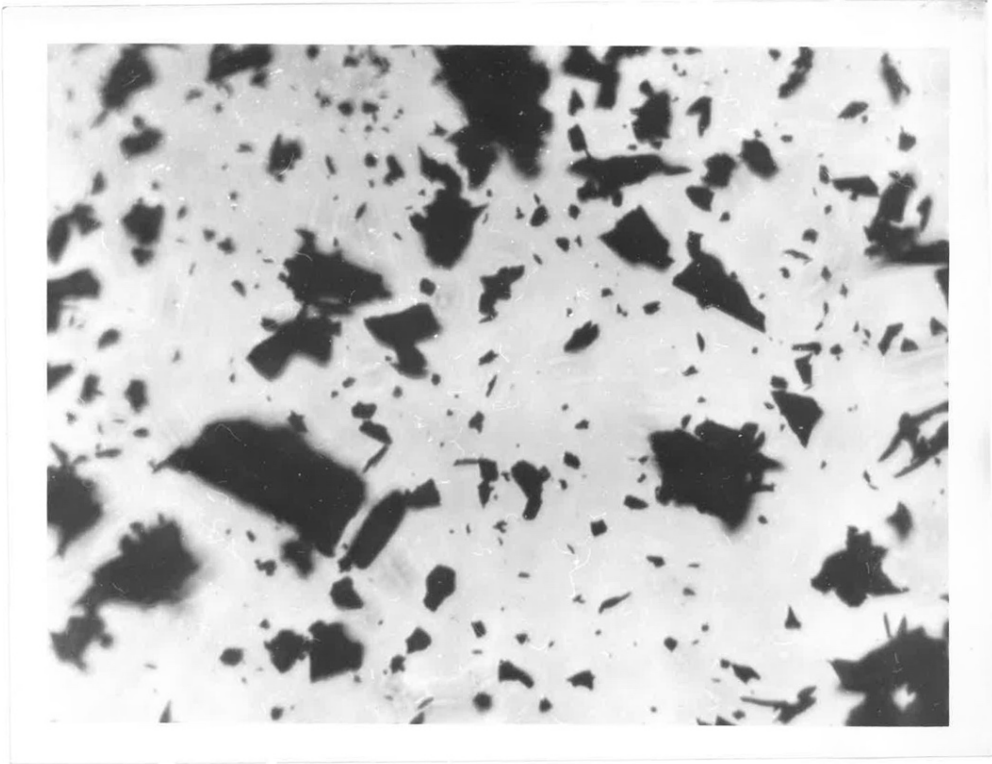
Figures 54 (top) and 55.

1. The accident as event: the aleatory and biopower

1.a. Historicising the accidental and the aleatory (and the event of the photograph)

> Genealogy is grey, meticulous, and patiently documentary […] it must record the singularity of events outside of any monotonous finality; it must seek them in the most unpromising places, in what we tend to feel is without history […].
>
> Michel Foucault, "Nietzsche, Genealogy, History."[226]

> Accident:
>
> 1. An unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury.
> 2. An event that happens by chance or that is without apparent or deliberate cause. The working of fortune; chance.
> 3. Philosophy (in Aristotelian thought) a property of a thing which is not essential to its nature.
>
> *Lexico, Oxford English Dictionary.*

> [Eventalisation] means making visible a singularity at places where there is a temptation to invoke a historical constant, an immediate anthropological trait or an obviousness that imposes itself uniformly on all. To show that things weren't 'necessary as all that'; […] A breach of self-evidence, of those self-evidences on which our knowledges, acquiescences and practices rest: this is the first theoretico-political function of eventalization. It means uncovering the procedure of causal multiplication: analysing an event according to the multiple processes that constitute it.
>
> Michel Foucault, "The Impossible Prison." [227]

What kind of event does the work accident constitute? What does its analysis reveal when it is considered as an object of enquiry for history?[228] What is involved in analysing the accident in its historicity? And what model of analysis can one turn to? In its common acceptation, the accident is perceived to be undetermined, or to occur by pure chance. It seems to bear no *evident* relation to a cause. It is commonly defined as an "event that happens by chance or that is without apparent or deliberate cause." It *appears to be* disconnected from any intentional form of action and to occur unexpectedly. That is, it is described as the product of chance itself, unrelated to human choice.

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[226] Michel Foucault, "Nietzsche, Genealogy, History," in *Language, Counter-memory, Practice: Selected Essays and Interviews*, trans. Donald F. Bouchard (Ithaca, NY: Cornell University Press, 1977), 139.

[227] Michel Foucault, "The Impossible Prison," in *Foucault live*: *Interviews, 1961-1984*, eds. Lysa Hochroth, John Johnston and Sylvère Lotringer (New York: Semiotexte, 1996), 277.

[228] When history is understood as a critical form of analysis, i.e., such as in the form of the genealogical methodology developed by Michel Foucault.

Further, the accident is also qualified as an "unfortunate" type of incident that "typically" results in "damage." It is thus associated with misfortune. It is qualified as that which is damaging, or injury-inducing. While the accident is understood to be without *apparent* cause, its definition points to its consequences: the accident as leading to a change or alteration in the quality or state of a thing, the accident as the cause of such alteration. Attention clusters around two poles – that of the absence of *apparent* or *deliberate* cause and that of *damage* – while the question of a *causal context* for the accident is obscured. Therefore, in a "breach of self-evidence," to use Michel Foucault's phrase, one could reframe the definition or analysis of the notion of accident from the question of *no apparent* cause to the question of an *obscured* cause or set of causes, and to that of the accident's *conditions of occurrence* (material and social) and those determining the *possibility* of such occurrence. One will need to ask: *what is obscured in the self-evidence that an accident is 'accidental'*? This points to a plurality of levels of intelligibility within which the accidental may be apprehended and analysed.

Hence, if the attempt to characterise a causal context for the accidental may seem paradoxical in a first instance – in the strict sense of running against doxa or common sense – it must be distinguished from the process of identifying or attributing the precise chain of causes that led to its event, i.e., its aetiology. To start with, the former will be better described as the process of framing the accident through the notion of historicity, i.e., the question of the *historical conditions* that lead to the possibility of its emergence, as well as that of *the obscuring of such conditions*. Tracing the historical contours of a reality that, one feels, is conceptually separated from the idea of historical determination, will not so much be a question of writing or narrativizing a minor history, as to engage with the notion of *history* as a critical category endowed with a *theoretico-political* function. History as a dynamic critical *process* and as a means of mapping the *relations* subtending the occurrence of the accidental.

While the term 'accident' is usually associated with the notion of the aleatory in a *general* manner, in this section, I wish to problematise both the notion of the aleatory and that of the accidental in relation to historicity[229] from the perspective of a specific methodological model. In order to proceed from the question of the aleatory to that of historicity, while putting them in tension and interrogating their relation, I propose to further consider how the notion of the aleatory is

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[229] Understood as the historical actuality of events: "[t]he historical dimension of human phenomena, or the distinctive sociohistorical circumstances of a specific event or series of events. Theories ignoring this dimension are ahistorical." Daniel Chandler and Rod Munday, *A Dictionary of Media and Communication* (Oxford: Oxford UP, 2020), under "Historicity."

integrated in the conceptual framework of a Foucauldian critical historiography. This will require to recall the significance of the aleatory in the definition of, as well as, in the constitution of biopower, and to consider its relationship to the formation of norms. It will be useful to re-emphasize how biopower is embedded in a genealogical analysis of history understood as *an analytics of power relations*. Tracing the historical factuality of the accident, in the context of work, means that the accident is not considered as an abstract, trans-historical category in this research. To do so necessitates to emphasize what is at stake methodologically in *historicising the accidental.* Which we will see, is linked to historicising (and denaturalising) the *normal*.

A further paradox relates to the means at hand. How does one trace the historicity of an event that may not have been recorded in its actuality (in the industrial context considered)?[230] Photography intervenes after the facts: in the documentation of the accident's aftermath or the documentation of forensic or pedagogical re-enactments. Other visualisation technologies are deployed during simulation experiments (such as videographic studies of chemical simulation tests or microscopic studies of cenospheres).[231] The accident is apprehended in a tension between the archivable and the unarchivable, the knowable and the unknowable. It constitutes a form of event that may escape representational as well as economic capture. It points to challenges with which the power to archive may be faced with. The fact that the accident constitutes an event that may not be *mediated* in its actuality, also brings the relationship of economic capture to technologies of representation into light.

Here, rather than take the impossibility of or the absence of a photographic record that would be immediately *concurrent to* the work accident for granted, one will interrogate the significance and value of such impossibility or absence. That is, one will consider the event of the photograph as consequence or as *effect,* as a power effect. This implies to interpret the photograph in a *relational* manner: i.e., through the framework of a genealogical economy of power relations. To

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[230] As mentioned previously, the use of flash photography in underground mining was too dangerous – until the invention of flash technology adapted to mining (the *flash anti-deflagrant* in 1952) – and would have constituted an unusual event. See Peroni and Roux, "La validité documentaire de la photographie," 41-42. At the coal front, mining galleries were built progressively by workers as extraction was gaining terrain, which means that no permanent infrastructures for continuous technological monitoring such as video-surveillance would have been possible to install (at least at the time when the archival documents considered were produced). Poor visibility is still an issue expressed today in the mining industry even with the advent of intelligent surveillance systems. See for instance: Mining Review. "Meeting mining's challenges with video surveillance." *Mining Review*, 30 November 2021, https://www.miningreview.com/health-and-safety/meeting-minings-challenges-with-video-surveillance/.

[231] A cenosphere is "a low density, chemically inert and spherical material filled with air/inert gas (either nitrogen or carbon dioxide)." Aamar Danish and Mohammad Ali Mosaberpanah, "Formation mechanism and applications of cenospheres: a review," *Journal of Materials Science* 55 (2020): 4539.

historicise the event of the photograph would be to link its post-accidental production or its impossibility to the nature of the force involved in the accident's event: to interrogate the *material* impossibility or absence of a photograph of the work accident in its actuality (in the extractive context discussed), is to interrogate the nature of the risk to which the worker/victim is exposed. That is, to problematise the photograph within an interplay of forces that may be incompatible, or asymmetrical in their respective degree of power. Hence the material possibility or impossibility of the production of a photographic document may be discussed from the perspective of a (micro)physics of relations of forces and of the politics of such relations.[232]

Additionally, one may argue that the absence of a photograph of the work accident itself contributes to mythologising the work accident as purely accidental, rather than historically and socially determined. This could be referred to as one of the normative effects of the photographic document. However, this could also point to the expression of a certain disjunctive force in the event of the work accident, a type of force such that it disrupts the 'normal' and regulated workings of (extractive) power and escapes economic capture, and that resists a certain power to archive. The possible absence of a photographic record of the work accident, of which it would be the indexical trace, points to the limits of a corporation's power to monitor or document the accident, which are technologically as well as environmentally conditioned. Hence, if there is an *an-archivic* dimension of the accident, in its resistance to the formation of an archival trace, it would be correlated to industrial power's limited technological capacities. Furthermore, the event of the work accident (as exemplified in the archival corpus considered) leads to a heterogeneity of photographic documents produced in conjunction with other representational forms (schemas, maps, plans, three-dimensional topographical models, mathematical equations, etc.). One may ask what would the material and aesthetic heterogeneity of photographic documents emerging in an accident's aftermath be the sign of? I will strive to link photographic heterogeneity to the question of power (that of the corporation) and its strategies. Hence, by inserting photographs as *visual quotes* endowed with a form of discursivity to be distinguished from linguistic discursivity, one may consider the particular agency of the photographic document through a notion of agency encompassing discursive and non-discursive *practices*, understood as material-discursive. Here the term practice is to be thought in relation to Michel Foucault's concept of *dispositif*.[233] The notion of a material-discursive agency of the

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[232] Michel Foucault introduces the notions of "political anatomy" and of a "micro-physics of power" in *Discipline and Punish: The Birth of the Prison* (New York: Vintage Books, 1977), 138.
[233] For useful overviews of the concept of *dispositif* see: Matti Peltonen, "From Discourse to "Dispositif": Michel Foucault's Two Histories," *Historical Reflections / Réflexions Historiques* 30, no. 2 (2004): 205-19; Davide Panagia, "On the Political Ontology of the Dispositif," *Critical Inquiry* 45, no. 3 (Spring 2019): 714-746.

photograph therefore emphasises the performative and material agency of the photograph beyond representation. The notions of practice and agency may be extended or completed by the notion of affect in so far as one may characterise affect as what circulates between social entities or formations – as a kind of soft infrastructure.[234]

Finally, another paradox concerns the dual or plural dimension of the work accident. It is unpredictable yet conditioned. It is a singular emergence while occurring in a form that presents visible and structural commonalities with other work accidents (forming accident types) as it takes place in the repetition of standardized or normalised procedures. It is the expression of a subjugation to a form of power, while presenting a form of resistance to such power (as it leads to the disruption of extraction-production). In proposing to articulate the accidental to the question of its historical conditions, one will consider the critical significance of the possibility of a destabilisation of power by aleatory or random events from the perspective of biopower and biopolitics.

1.b. The aleatory as problem – What is a 'problem'?

Considered as an *economic* event, the work accident sheds light on the notion of the aleatory from a particular point of view: that of what economic power can or cannot do in face of the aleatory. The accident constitutes a problem for a form of power relying on economic and demographic equilibrium. One may here recall Michel Foucault's definition of biopower as a regulatory form of power aiming to establish a form of homeostasis.[235] The latter is achieved through the containment of phenomena affecting a population as a biological mass, such as aleatory events (as discussed in this section). I therefore wish here to turn to a historical and critical analysis of the aleatory as the analysis of the latter's *effects* on power. For, if the accidental, as a form of aleatory event, escapes the rationality of repetitive procedures upon which economic power relies, and if it escapes prediction, one may move from the question of what power can or cannot know of the aleatory and the accidental to what *kind* of problem the aleatory and the accidental constitute for power and society. This entails considering the question of how 'problem for power' may be defined.

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[234] For instance, Ben Anderson discusses greed and fear as forms of affects operating as infrastructures in capitalism: "To paraphrase Massumi on confidence, greed is as infrastructural to capitalism as a factory or a trading floor. [...] greed is both an effect of and an element within the value-producing activities [of] capitalism. But [...] greed also becomes akin to an affective condition; a collective mood that is imbricated with a repetition of the desire continually to accumulate capital that is integral to waves of capitalist construction and destruction." Ben Anderson, *Encountering Affect: Capacities, Apparatuses, Conditions* (Farnham, Surrey: Routledge, 2014), 11.
[235] Foucault, *SMBD*, 246.

From a Foucauldian perspective, the question of 'a problem for power' can be described as the question of what processes and technologies power deploys to rationalise or circumvent the aleatory and to regulate its effects. I wish here to consider a biopolitical interpretation of the (work) accident in more detail and accord more time to the question of norms, normalisation, and their relation to power. And this with a particular regard to the aleatory as a *strategic* problem. A problem whose urgency leads to the deployment of a multiplicity of strategies: a reality that puts demands on power as it constitutes a type of destabilising or disruptive force to be countered or regulated.

The genealogical models of disciplinary power and biopolitical power delineated by Foucault in his lectures at the College de France in the mid-seventies[236] are helpful in untangling the problem of risk (that of injury or death) encountered by workers in the industrial context, and for problematising the question of power at large. I wish here to quickly recall the lineage traced by Foucault between sovereign, disciplinary, and regulatory forms of power. Foucault characterized biopower as contrasting a model of power centred on the sovereign.[237] While classical sovereignty is referred to as "the right to take life or let live" (where the right of life and death are "attributes of the sovereign"),[238] Foucault, in a lecture aiming at discussing state racism,[239] traces the emergence in the 18th century of a radically new form of power, which he defines as "the right to make live and to let die."[240] According to Foucault, "one of the greatest transformations political right underwent in the nineteenth century" was that "sovereignty's old right" became slowly permeated by "precisely the opposite right." Foucault does not attempt to trace this transformation at the level of political theory, "but rather at the level of the mechanisms, techniques, and technologies of power."[241] The latter are according to him linked to techniques developed in the 17th and 18th century which were centred on the body (as an individual entity), and which are constitutive of a "disciplinary" form of power. Disciplinary power operates through "techniques for rationalising and strictly economizing on a power that had to be used in the least costly way possible, thanks to a whole system of surveillance, hierarchies, inspections, bookkeeping, and reports – all the technology that can be described as the disciplinary technology of labor."[242] From the end of the 18th century onwards, a new non-

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[236] Michel Foucault, *Il faut défendre la société: Cours au Collège de France, 1975-1976* (Paris: Gallimard/Seuil, 1997).

[237] For critical overviews of the concept of biopolitics and its currency see: Thomas Lemke, *Biopolitics: An Advanced Introduction* (2011).

[238] Foucault, *SMBD,* 241.

[239] His final lecture from the series on 17 March 1976, see Foucault, *SMBD,* 239-264.

[240] Foucault, *SMBD,* 241.

[241] Foucault, *SMBD,* 241.

[242] Foucault, *SMBD,* 242. For a discussion of Foucault's position on a Marxian interpretation of labour, see Pierre Macherey, "The Productive Subject," *Viewpoint Magazine*, 31 October 2015, https://www.viewpointmag.com/2015/10/31/the-productive-subject/.

disciplinary power emerges that does not exclude the former, but integrates it and embeds itself in its techniques. This new form of power does not apply itself to the body in an individualising manner, but to bodies as constituting a mass or species:

> From the eighteenth century onward (or at least the end of the eighteenth century onward) we have, then, two technologies of power which were established at different times and which were superimposed. One technique is disciplinary; it centers on the body, produces individualizing effects, and manipulates the body as a source of forces that have to be rendered both useful and docile. And we also have a second technology which brings together the mass effects characteristic of a population, which tries to control the random events that occur in a living mass […][243]

These two forms of power constitute two different forms of "seizures of power" through the body, one that is individualizing and produces a docile body at the level of individuals, and the other which is massifying and aims at regularizing events pertaining to a *new political subject*, the *population*. There is an overlapping of "an anatomo-politics of the human body" with "a 'biopolitics' of the human race."[244] Hence, a disciplinary power of the body and a regulatory power centred upon life, biological functions and phenomena affecting the population as living species, operate in combination with one another: a technology of "drilling" striving for the control of individual bodies and a technology of "security" striving for equilibrium at the level of masses.[245]

I wish to now emphasize the significance of the aleatory in Foucault's characterization of biopower. Foucault frames the aleatory within the field of biopolitics in that it constitutes a problem for a form of power that aims at 'regularizing' life to secure the productivity of a population and prevent the loss of vital capacities. Biopower is here defined as "a power of regularization [which] consists in making live and letting die."[246] As mentioned previously, it is a form of power that treats life at the level of its generality, and for which, life itself becomes a technology: "the regulatory technology of life."[247] Furthermore, biopower addresses the problem of the aleatory with regards to its impact on the population:

> The phenomena addressed by biopolitics are, essentially, *aleatory events* that occur within a population that exists over a period of time. […] The mechanisms introduced by biopolitics include forecasts, statistical estimates, and overall measures. And their purpose is not to modify any given phenomenon as such, […] but, essentially, to intervene at the level at which these general phenomena are determined, to intervene at the level of their generality. (My emphasis.[248])

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[243] Foucault, *SMBD,* 249.
[244] Foucault, *SMBD,* 243.
[245] Foucault, *SMBD,* 249.
[246] Foucault, *SMBD,* 247.
[247] "[…] a technology which brings together the mass effects characteristic of a population, which tries to control the series of random events that can occur in a living mass, a technology which tries to predict the probability of those events (by modifying them if necessary), or at least to compensate their effects." Foucault, *SMBD,* 249.
[248] Foucault, *SMBD,* 246.

A few points can be underlined from this characterization:

- aleatory events (as affecting lives at the level of the population) constitute the core "phenomena" which biopower addresses in practice or *strategically*,

- the emergence of biopower is linked to the emergence of fields of knowledge such as statistics[249] and demography,

- such technologies imply a level of abstraction or "generality" at which level life is apprehended as mass or multiplicity,

- biopolitical mechanisms do not modify phenomena but to intervene at the level of their general determination.

Further, while sovereign power ("the right to take life or let live") implies a more visceral relationship to life and death, biopower treats both in a "general, overall, or statistical term:"

> Now that power is decreasingly the power of the right to take life, and increasingly the right to intervene to make live, or once power begins to intervene mainly at this level in order to improve life by eliminating accidents, the random element, and deficiencies, death becomes, insofar as it is the end of life, the term, the limit, or the end of power too. Death is outside the power relationship. Death is beyond the reach of power, and power has a grip on it only in general, overall, or statistical term. Power has no control over death, but it can control mortality.[250]

Biological death is evinced from the power relationship, as taking life is no longer a mechanism of the exercise of power.[251] According to Foucault, this form of regularising power leads to the disqualification of death.[252] The problem of the normalisation of work accidents, presented as a form of risk that is *natural to* the danger-fraught domain of underground coal mining, reflects the contradiction in which a biopolitical management of a working population by a corporation is caught: "[g]iven that this power's objective is essentially to make live, how can it let die?"[253] This contradiction reflects the superimposition of competing rationalities and interests, those relating to capitalist profiteering and market logics, and that of a biopolitical management of the population deployed by state and corporate institutions and practices.

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[249] See Ian Hacking, "Biopower and the Avalanche of Numbers," *Humanities in Society* 5, no. 3–4 (1982): 279–95.

[250] Foucault, *SMBD,* 248.

[251] In societies where the death penalty is no longer applied.

[252] Foucault, *SMBD*, 247-249.

[253] "If it is true that the power of sovereignty is increasingly on the retreat and that disciplinary or regulatory disciplinary power is on the advance, how will the power to kill and the function of murder operate in this technology of power, which takes life as both its object and its objective?" Foucault, *SMBD*, 254.

1.c. The accident, the aleatory, and biopower

The attempt to re-present the accident in different forms of documentation (which include aftermath photography, photographic re-enactments, visual technologies used during simulations, or various microscopic studies) reveals a series of obstacles that power encounters in order to remain operative. It draws attention to how the accident comes to disrupt a logic that aims at establishing and maintaining an equilibrium through regulatory mechanisms. Critically, the aleatory and the accidental are central to the very *constitution* of biopower as biopolitical mechanisms are deployed *in response to* them. Discursive and non-discursive mechanisms or technologies deployed by (bio)power are constituted *strategically* in response to accidents or to the risk presented by them and other forms of "random elements." In this sense, photography ought to be understood as a form of tactical strategy deployed by the corporation. It may be argued that not only does the accident present a *strategic urgency* undermining the stability of life, and hence of (bio)power, but it also constitutes a kind of disturbance in the interplay of power relations, which is *productive* of the forms that power will take. The accidental, random events affecting biological processes and the population in general, are therefore not only the field of application of power, but they also force power to invent and deploy new practices, mechanisms, and technologies.

To summarise, the accident is thus a type of event that constitutes a strategic problem for biopower which embeds regulatory mechanisms with disciplinary technologies to maintain economic and demographic homeostasis. The question of damage to a body can thus be reframed through the notion of the body as a form of political technology inscribed in an apparatus or *dispositif* of power. François Ewald highlighted the centrality of the body in genealogical analysis, which "poses the problem of power and of the body (of bodies)," the problem of "the imposition of power upon bodies."[254] Furthermore, the analytic of power serves a methodological function and constitutes a "grid of intelligibility for the social field."[255] As underlined by Thomas Flynn, since *Discipline and Punish* (1975), Foucault's "concept of power enables us to understand relations in history in terms no longer of knowledge and meaning but of strategy and tactics."[256] Genealogy may therefore be understood as an analysis of history (including that of the present) that is based on an analytics of power relations, an analytics in which the political technology of bodies and subjects is central.

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[254] François Ewald, "Anatomie et corps politique," *Critique* 343 (1975): 1229, quoted in Thomas R. Flynn, *Sartre, Foucault, and Historical Reason: A Poststructuralist Mapping of History* (Chicago: University of Chicago Press, 2005), 58.
[255] Foucault, *DP,* 139.
[256] Flynn, *Sartre, Foucault, and Historical Reason*, 58.

Biopower ought to be understood from the perspective of this form of analysis. It is from the perspective of an economy of *relations of power* that both the (work) accident and its (photographic) documentation may be analysed. This requires considering the inscription of both the accident and its documents in the archival-industrial complex from the perspective of the concept of the *dispositif* and its heterogeneity.

2. The accident, the apparatus, and the *dispositif*

2.a. From temporal causality to the *dispositif*

One may problematise both the question of the accident's resistance to causal explanation and that of the accident's consequences or impact, in relation to the accident's inscription in a network of institutions, mechanisms, practices, technologies, and agencies. That is, its inscription in a particular *dispositif* or apparatus of power as understood in a Foucauldian sense. Such problematisation may show how analysing the accident can be shifted away from the problem of a lack of causal clarity through the notion of *dispositif*. The *dispositif,* as concept, allows one to displace the question of a temporal understanding of the accident to that of structural relations or of an interplay between such relations in a wider ensemble.[257] Hence, one may move from an understanding of the accident as an event inscribed in a linear, temporal chain of causes (from cause A, to consequence B) to that of an event determined by plural causation, best understood in terms of correlations between a multiplicity of entities and processes forming a heterogeneous ensemble, the *dispositif*. Foucault's concept of "causal multiplication" refers to a form of determination conditioned by such heterogeneity (material and discursive) beyond temporal causality:

> […] the first theoretico-political function of eventalization […] means uncovering the procedure of causal multiplication: analysing an event according to the multiple processes that constitute it.[258]

From this perspective, one may point out the plural nature of the events, processes, or mechanisms that constitute the reality of extraction. A technical procedure undertaken through the actions of a worker, for instance, is always plural, multiple: it is always a set of actions taking place at the intersection of technologies, extractive methods, the logical imperative of productivity, hierarchised

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[257] Foucault describes relations within a *dispositif* as operating through "correlations." See Michel Foucault, *Security, Territory, Population* (New York: Palgrave McMillan, 2007), 8.
[258] Foucault, "The Impossible Prison," 277.

labour relations, etc. but it also constitutes a set of actions that are open to chance and the aleatory, nevertheless. Such procedure therefore cannot be fully reduced to the logics of extraction.

Stuart Elden notes that the term *dispositif* was first used by Michel Foucault in *Discipline and Punish* (1975)*,* while it came to the fore in *The Will to Knowledge* (1976)*.* The term has been variously translated as "'construct', 'deployment', 'apparatus' and 'grid of intelligibility'."[259] Ben Anderson notes that *dispositif* is also sometimes translated as "social apparatus."[260] A *dispositif* may be broadly understood as the relational *context* in which technologies develop[261] and forms of power are enacted. According to Elden, Foucault clarifies what he meant by this term in a 1977 round-table interview[262] in which he stated:

> What I'm trying to pick out with this is, firstly, a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory discourses, laws, administrative measure, scientific statements, philosophical, moral and philanthropic propositions - in short, the said as much as the unsaid. Such are the elements of the apparatus. The apparatus itself is the system of relations that are established between these elements. Secondly, what I'm trying to identify in this apparatus is precisely the nature of the connection that can exist between these heterogeneous elements. Thus, a particular discourse can figure at one time as the programme of an institution, and at another it can function as a means of justifying or masking a practice which itself remains silent, or as a secondary re-interpretation of this practice, opening out for it a new field of rationality. In short, between these elements, whether discursive or non-discursive, there is a sort of interplay of shifts of position and modifications of function which has its major function at a given historical moment of responding to an *urgent need*. The apparatus thus has a dominant strategic function (emphasis in the original).[263]

A *dispositif* (translated as apparatus in the quote) presents the following characteristics:

- it is "thoroughly heterogeneous,"

- it is constituted of discursive as well as non-discursive elements,

- it is the *system of relations* or *network* between heterogeneous elements,

- it is constituted through "an interplay of shifts of position and modifications of function" between elements, which has the function of "responding to an urgent need,"

- it possesses "a dominant strategic function."

Anderson argues that such a definition of *dispositif* (or apparatus) would make it "equivalent to linked terms that also attempt to capture a sense of ontological diversity; mesh, assemblage,

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[259] Stuart Elden, *Mapping the Present: Heidegger, Foucault and the Project of a Spatial History* (London: Continuum, 2001), 110.
[260] Anderson, *Encountering Affect,* 33.
[261] Elden, *Mapping the Present*, 110.
[262] Elden, *Mapping the Present*, 110.
[263] Michel Foucault, "The Confession of the Flesh," in *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*, ed. Colin Gordon (London: Harvester Press, 1980), 194–195.

network, for example."[264] According to Anderson, "[we] can take the term 'network' to be equivalent to the term 'system of correlation' used in the lecture series [*Security, Territory, Population*]."[265] The notion of network should be thought of as "a characteristic relation or set of relations through which the differential elements that make up an apparatus [*dispositif*] come together and may be held together"[266] while involving a "style of structuration."[267]

Further, the *dispositif* undergoes a perpetual process of "strategic re-elaboration" or "strategic completion."[268] Anderson underlines how "[u]nintended or negative effects will be enrolled into a new strategy (referred to by Foucault as 'strategic elaboration')."[269] And further, he refers to "intentional" as well as "unintentional 'effects'" entering into "resonance" or contradiction with one another.[270] The term "effect" is to be understood as *power effect*, and it is used to refer both to elements that are external and internal to a *dispositif*. In this logic, the accident presents the dual character of being external *and* internal to such an ensemble, and as having an effect *on* power, while *being* a power effect at the same time.

Hence, while the accident may be perceived as unpredictable, and as escaping the order of causal explanation and the logics of power, when considered through the prism of series or sets of events, it presents characteristics common to other 'accidental' events – types emerge.[271] Paradoxically, while unpredictable, the accident is bound to and by the material conditions in which it occurs. Consequently, its occurrence is rendered structurally possible by the latter. A work accident may not happen in different conditions. In this chain of thought, the accidental may be understood as structurally conditioned. As a category of event, the work accident ought to be analysed from the perspective of "causal multiplication," that is, from the perspective of "the multiple processes that constitute it." [272] Hence to trace the paradoxical nature of the accident allows one to problematise it as *correlated* to a multiplicity of conditions and processes. And by extension, the photographic documentation of its aftermath may be problematised in light of the ideas of *dispositif* (or apparatus), correlations, power effects, and that of a heterogeneity of formations.

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[264] Anderson, *Encountering Affect,* 34.
[265] Anderson, *Encountering Affect,* 35; see Foucault, *SMBD,* 8.
[266] Anderson, p. 35.
[267] Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Duke University Press, 2010), which is referred to in Anderson, *Encountering Affect,* 35.
[268] Foucault, "The Confession of the Flesh," 195.
[269] Anderson, *Encountering Affect,* 35.
[270] Anderson, 34-35.
[271] See Chapter 1 for a discussion of accident types.
[272] Foucault, "The Impossible Prison," 277.

2.b. Historicity of the accident and the question of norms

While biopower functions through mechanisms of regularization, according to Foucault normalising mechanisms operate at the juncture of disciplinary and regulatory forms of power. When discussing the workings of what he refers to as "the normalizing society," Foucault seems to suggest that "normalizing procedures" are the result of a contention between the exercise of rights and that of disciplines or disciplinary techniques. Foucault refers to *a colonization of right by norm*:

> In our day, *it is the fact that power is exercised through both right and disciplines*, that the techniques of disciplines and discourses born of discipline are invading right, and that normalizing procedures are increasingly colonizing the procedures of the law, that might explain the overall workings of what I would call a 'normalizing society.'[273] (My emphasis)

While, according to this statement, normalizing mechanisms may first seem associated with disciplinary power,[274] Foucault refers to the norm as the element that circulates between disciplinary and regulatory practices. In analysing the conjunction of practices linked to medicine and hygiene for instance, Foucault comes to identify points of articulation between the disciplinary and the regulatory which, according to him, may be generalised:

> In more general terms still, we can say that there is one element that will circulate between the disciplinary and the regulatory, which will also be applied to body and population alike, which will make it possible to control both the disciplinary order of the body and the aleatory events that occur in the biological multiplicity. The element that circulates between the two is the norm.[275]

The norm may be understood to designate an instrument that enacts a form of rationality (e.g., discipline or regulation) that has become effective as practice in society:

> The norm is something that can be applied to both a body one wishes to discipline and a population one wishes to regularize. […] The normalizing society is a society in which the norm of discipline and the norm of regulation intersect along an orthogonal articulation.[276]

While normalisation may be defined as a technique enforcing a certain concept of normality by applying and reproducing social norms, norms may be understood as defining "parameters of normality:"

> Simply put, the norm – the idea of having a standard (or that a standard exists or can be instituted) by which to evaluate and thereby determine "optimal" modes of behavior, levels of productivity, states of health, and the like – establishes what is normal. [277]

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[273] Foucault, *SMBD*, 38-39.
[274] Ladelle McWhorter for instance refers to "normalizing power" as historically emerging in the 18th century from "the coalescence and refinement of myriad of disciplinary practices that aimed to control and cultivate the capacities of individual bodies." Ladelle McWhorter, "Normalization," in *CFL*, 315.
[275] Foucault, *SMBD*, 252.
[276] Foucault, *SMBD*, 253.
[277] Dianna Taylor, "Abnormal," in *CFL*, 4.

Significantly, as Dianna Taylor points out, the "sedimentation" of norms reaches a point where techniques of normalisation[278] appear as if there are not a *product*, but as "natural and necessary" and norms become "uncritically accepted," that is, *normalising.* Both norms and normalisation enact what may be referred to as "normalizing power."[279] Ladelle McWhorter offers an overview of the emergence of norms which shows the conjunction of disciplines which emerged in the military and religious institutions with statistics. A norm here corresponds to "average or typical temporal trajectories for the acquisition of various skills or capacities in various populations of individuals."[280] Normalising processes recall the operations of ideology as described in the work of Louis Althusser,[281] as the concepts of normalisation and normalising power allow for thinking how an idea (*the normal*) is produced and becomes effective in practice. However, Foucault demarcated the process of social control away from the concept of ideology and underlined the centrality of norms as the basis for the exercise of power.[282] For instance, capitalism's seizure of individuals and their productive power operated through biopolitical mechanisms and strategies aimed at the body:

> Society's control over individuals was accomplished not only through consciousness or ideology but also in the body and with the body. For capitalist society, it was biopolitics, the biological, the somatic, the corporal that mattered more than anything else. The body is a biopolitical reality; medicine [for instance] is a biopolitical strategy.[283]

Furthermore, as underlined by Taylor, Foucault shows that "by forging a relationship between the two targets of modern power [the individual and the population], the norm facilitates the spread of (potentially normalizing) power across 'the whole surface' of society."[284]

If photographic documents operate in a field of action situated at the intersection of biopolitical and disciplinary mechanisms, how may one characterise their inscription in normalising mechanisms? One may say that while their embeddedness with discursive practices and their ideological effects, may be analysed from the perspective of normalising effects pertaining to representation and the production of meaning (e.g., when used in reports or public relations campaigns aimed at raising

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[278] Such as standards defining efficient learning and bodily disciplines in schooling, e.g., "teaching and learning proper penmanship." Taylor, "Abnormal," 4.

[279] Taylor, "Abnormal," 4.

[280] McWhorter, "Normalization," 317.

[281] According to Warren Montag, "[...] for Althusser, ideology, the system of ideas that justified and contributed to the reproduction of class exploitation, did not exist in the form of a false consciousness that might be dispelled by true ideas but was consubstantial with the material apparatuses and practices that governed a given society at a given historical moment." Warren Montag, "Louis Althusser (1918–1990)," in *CFL*, 550.

[282] "The norm is not simply and not even a principle of intelligibility; it is an element on the basis of which a certain exercise of power is founded and legitimized" Michel Foucault, *Abnormal: Lectures at the Collège de France 1974–1975*, trans. Graham Burchell (New York: Picador, 2003), 50.

[283] Michel Foucault, "The Birth of Social Medicine," in *Power: Essential Works of Foucault, 1954–1984*, ed. James D. Faubion (New York: The New Press, 2000), 137.

[284] Taylor, "Abnormal," 4.

awareness to risk and safety; in producing a visual rhetoric of healthy, productive, labouring bodies; or that of health management in photographs documenting the medical monitoring of workers; or else portraying the vigilant body in re-enactment scenes; etc…), the *practice* of photography may be understood as the locus of application of a certain power to document or to intervene at the conjunction of the application of standards, techniques, etc. (for instance when photography is marshalled in simulation experiments). Photography as practice ought to be understood relationally, as inscribed between members of a workforces, institutional entities, and other technologies of power, within the operations of a heterogenous *dispositif* of power. The practice of photographic documentation therefore may be understood to correlate different domains of the exercise of corporate power, as a kind of vector. As Gilles Deleuze described it: "[v]isible objects, articulable statements, forces in use, and subjects in position are like vectors or tensors" in the "multi-linear whole" of the *dispositif*.[285]

While attempting to trace how photography may be inscribed in procedures of normalization, one may argue for its capacity to escape them. In Chapter 2, I have proposed to explore points of instabilities in the apprehension of photographic documents, by considering an affective dynamic whereby details or figural elements become endowed with a new value. The Barthesian thematic of the *punctum* and its power of expansion was revisited with respect to the notions of affect-values, the supplement, and of a dynamic whereby the value of the photographic document may be transformed, while considering the possibility of a link between affect and the historicity of photographic detail, through the notion of a historical supplement. Furthermore, the disruption of the extraction-production and its logics by the unpredictability of the work accident enables one to formulate and exploit points of tension between a *dispositif* (or apparatus) that aims to capture or extract value out of life and the heterogeneous material, archival, and affective aftermath of an accident.

Even though the accident may not be circumvented or known in its actuality,[286] it becomes however normalised, or more precisely, it becomes the target of normalising strategies. Which may not mean that normalisation (as a process) is experienced homogenously across a corporation's hierarchised workforce. The practice of normalising work accidents may not take away the horizon of threat and dread created by its possibility. By *the force of a certain form of repetition*, the accidental, while retaining a shocking dimension for workers, families, and communities, becomes *inscribed* or *integrated* in a variety of practices (discursive and non-discursive) of which photographic capture is

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[285] Gilles Deleuze, "Dispositif (Apparatus)," in *CFL*, 126.
[286] In the historical examples considered by this research.

only but one form. While the work accident may not be documented in its actuality (in the specific context considered), its occurrence however leads to the production of a heterogeneous body of traces in the deployment of strategies aimed at knowing, preventing, or predicting. One may say that the accident appears to be *norm producing* (e.g., leading to the formation of new standards, safety protocols, and technologies of security).

However, in the fashion of a genealogical inversion[287] one may consider the normalising procedures that condition the accident's very occurrence. That is, to question the very concept of the accidental, including in its administrative form (as it appears in the administrative archives of an industrial company). The very practice of labelling work accidents leading to injuries or fatalities as *accidental* may be deemed to naturalise these incidents as conditioned by chance and not by social relations. The practice of considering work accident victims as *individual victims* may contribute to the fact that accidents are considered as separate instances. While accounted for over an extended period of time, all individual victims of accidents form a mass, and work accidents start to take the shape of a collective problem. One proposes to consider *the accident as effect*. That is as an effect of power. One may depart from a genealogy of the norms produced in the wake of the accident, to consider a genealogy of the norms conditioning the possibility of the latter's occurrence and its being naturalised as *accidental*. According to Thomas R. Flynn, the genealogist "seeks a new economy of power relations beneath the surface" of social formations.[288] In this effort, the following points may be considered: the relations at play in the work accident; the processes deployed to handle its effects; the objects of knowledge produced; and the elements that may be obscured or presented as self-evident ("eventalization" was linked to "a breach of self-evidence" as mentioned above).

Analysing the historicity of the accident therefore consists in highlighting the historicity of norms operative in the context of specific relations of power. This is to the extent that one of the effects of regulatory technologies consists in naturalising norms. Historicizing norms means to denaturalise norms and to highlight the historical dimension of their being or existence, i.e., their character of being strategically produced. Tracing the historicity of work accidents would therefore consist in highlighting the ab-normality of norms that naturalise the accident as acceptable or normal. The notion of the ab-normality of such norms would point to their pre-history, in which the work accident would still be perceived as abnormal. Tracing the historicity of work accidents would mean to articulate their abnormal and historical dimensions.

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[287] Flynn underlines the method of "nominalist inversion" - where what is perceived as a consequence of a problem is in fact revealed to be its condition. For instance, Foucault "argues that the science of criminology is not so much the response to the problem of the delinquent as its very condition" as "the prisons of the carceral system produce that gray stratum of society, half-legal and half illegal, [...]" In Flynn, *Sartre, Foucault, and Historical Reason*, 59.

[288] Flynn, *Sartre, Foucault, and Historical Reason*, 60.
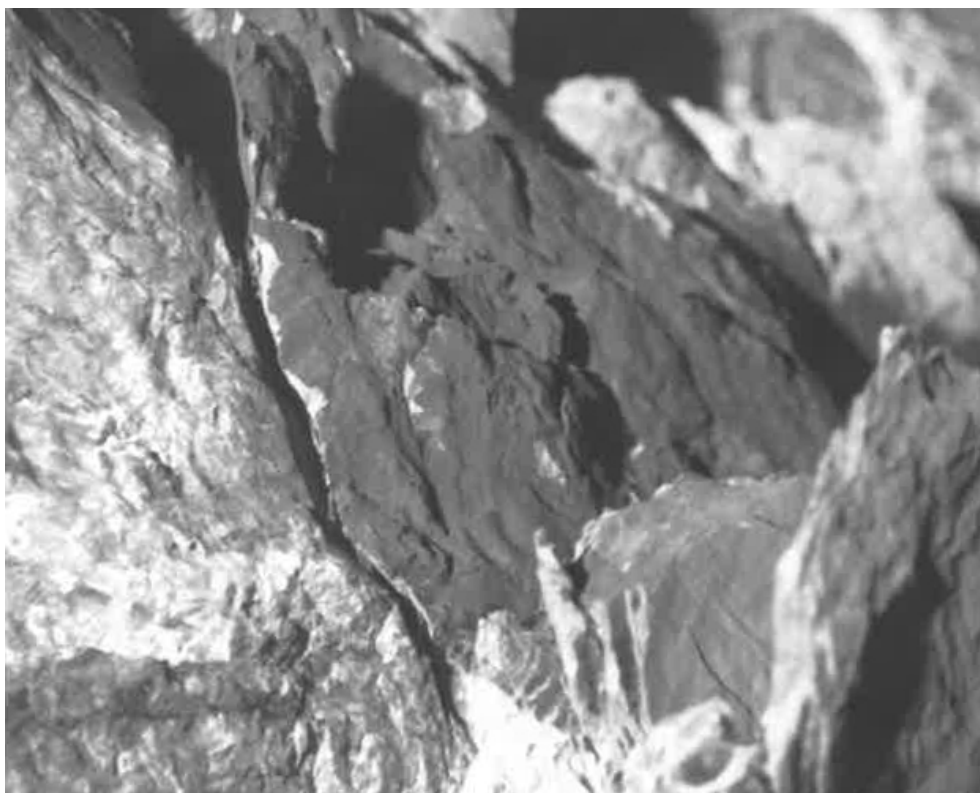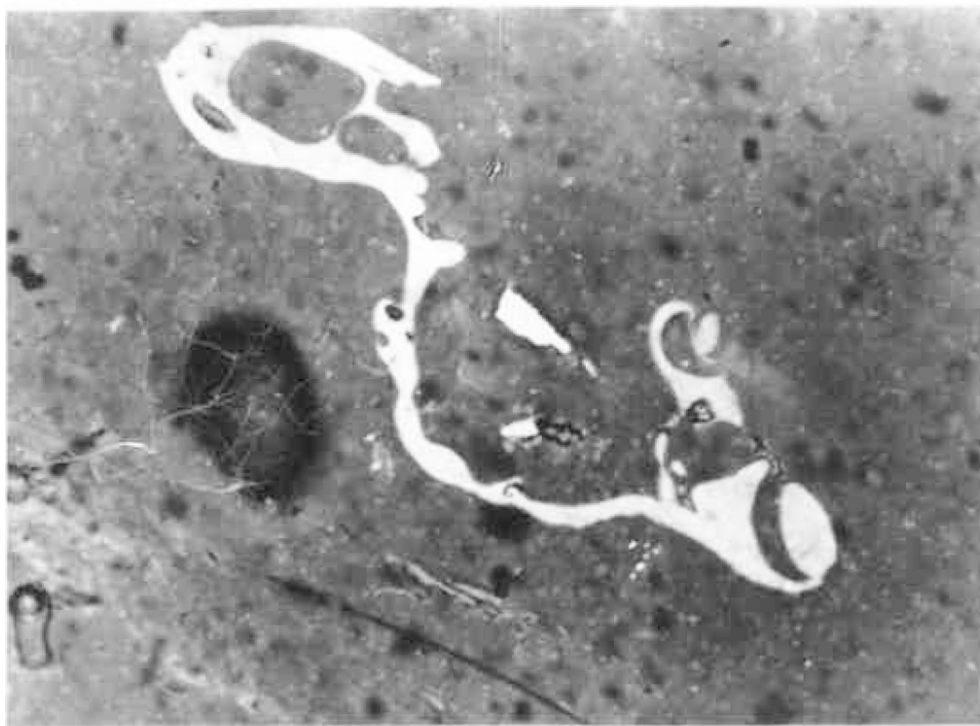
Figures 56 (top) and 57.

The material and formal (or aesthetic) heterogeneity of the photographic documents that emerge in the wake of the same accident requires attention. The two photographic documents juxtaposed at the beginning of this chapter relate to the 1948 Vuillemin colliery disaster which took place in Petite-Rosselle, France.[289] The two photographs inserted in this section, offer yet two different visual or material *versions* of the accident's aftermath, enabled by the use of two different kinds of photographic technologies (microscopic photography and medium format photography with flash). By inserting the photographs without captions, I wished to emphasize the particular agency or visual discursivity of photographs, as well as the heterogeneity of the forms of documentation deployed or taking shape after an accident. Hence the photographs inserted in this chapter do not merely have an illustrative value but are considered in their visual, material discursivity or agency and how it relates to historicity. What is the heterogeneity of visual, material, and rhetorical[290] forms documenting an accident the sign of? What do the *material and aesthetic plurality* or *heterogeneity* of photographic documents emerging in a work accident's aftermath express? And of what are they the effect?

The question of photographic indexicality may be problematised in relation to the notion of a force at work in the deployment of a *multiplicity* of practices and technologies of representation, which is linked to the intervention of a form of power in the face of *urgency* or when faced with a problem. This relates to the notion of strategic urgency to which a *dispositif* responds, as discussed earlier. Heterogeneity would then be the expression of an effort of elucidation deployed in the face of something causing trouble and posing demands on power, but also of a form of figural pluralisation and representational dissonance taking place in the wake of a work accident, be it of a minor or of a large scale. Paying attention to the heterogeneity of what may be termed the instrumental aesthetic of the photographic image leads one to the question of *a qualitative difference* in, and *gaps* between, forms of representations, such as between the first and second images inserted at the start of this chapter, or of this section.

It may be argued that photographic heterogeneity or pluralisation constitutes an effect of power while also expressing a form of resistance to power, as material or aesthetic pluralisation points toward gaps and differences in representational attempts.[291] Hence the heterogeneity of photographic forms would be the very expression of a strategic problem for power. The material multiplicity of photographic forms may therefore be thought in terms of the very heterogeneity

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[289] For full details see the List of illustrations.
[290] I am also referring here to the different types of discourses accompanying photographic documents, i.e., testimonial reports, forensics, scientific studies, journalistic articles, etc. See Appendices 5, 6, and 7.
[291] Such as between microscopic studies of heat damage studies as exemplified by the photographs inserted in this chapter.

characteristic of a *dispositif* of power discussed earlier, as well as in terms of the diffuse form in which power circulates or propagates. As noted by Sergio Tonkonoff, the notion of diffusion appears when Michel Foucault seeks to analyse the formation of what he referred to as "the disciplinary society."[292] In *Discipline and Punish* (1975) Foucault discussed the generalisation of the model of disciplines and the "swarming of disciplinary mechanisms," to refer to the tendency of such mechanisms to become "de-institutionalised," i.e., to "emerge from the closed fortresses in which they once functioned and to circulate in a 'free' state; [whereby] the massive, compact disciplines are broken down into flexible methods of control, which may be transferred and adapted."[293] It may be argued that the characterisation of the "swarming" and breaking down of disciplines for their effective expansion or diffusion may be applied to other mechanisms of power, and is linked to the analytical framework of a "microphysics" of power:

> A macro- and a micro-physics of power made possible, not the invention of history (it had long had no need of that), but the integration of a temporal, unitary, continuous, cumulative dimension in the exercise of controls and the practice of dominations.[294]

Tonkonoff points out that Foucault's microphysics has affinities with Gabriel Tarde's microsociology in which "diffusion is not something that can be circumscribed to certain specific areas of social life" and for both authors, it is "a constituent process of the social organisation *tout court*."[295] Methodologically, the concept of diffusion is linked to the analytical framework of genealogy, which treats power not as "a trans-historic, universal, and immutable entity, but rather approach[es] it as a historically variable and locally situated mechanism."[296] Diffusion as a concept expresses how genealogy investigates larger scale social transformations through "the details of minor local occurrences" and always constitutes a "micro-analysis" or "social microphysics."[297] Tonkonoff refers to the process of diffusion through "the paradigm of infinitesimal difference" and characterises the social "as an infinite field of infinitesimal and differing differences."[298] In his later work Foucault describes biopower as a *continuous* (and *scientific*) form of power[299] as opposed to sovereign power, which was dependent on discontinuous "chronologically defined systems."[300] Sovereign power depended on discontinuous systems such as taxation and obligation, while disciplinary and regulatory forms of power enable the continuous seizure of labour forces and biological processes, through

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[292] Sergio Tonkonoff, *From Tarde to Deleuze and Foucault. Palgrave Studies in Relational Sociology* (New York, USA: Palgrave Macmillan, 2017), 80.
[293] Foucault, *DP*, 211.
[294] Foucault, *DP*, 160. See also 26-27 and 139.
[295] Tonkonoff, *From Tarde to Deleuze,* 80.
[296] Tonkonoff, *From Tarde to Deleuze,* 80.
[297] Tonkonoff, *From Tarde to Deleuze,* 80.
[298] Tonkonoff, *From Tarde to Deleuze,* 5.
[299] Foucault, *SMBD*, 247.
[300] Foucault, *SMBD*, 36.

systems of surveillance, subjectivation, bodily disciplines, biological control, and the management of populations, for instance. However, while biopolitical technologies aim at fostering a continuous hold or seizure of power over life, the accidental constitutes a continued threat to such seizure. Photographic multiplicity (as emerging in the aftermath of a work accident) constitutes one of the diffused interventions of power and expresses the multiplicity of forms and fronts that strategies deployed by power to tackle the aleatory or accidental and its effects will take.

Hence, while photographic multiplicity is the result or effect of a certain efficacy or positivity of power, material differentiation or pluralisation is the sign or expression of a limit to such efficacy. Multiplicity and heterogeneity would be the expression of a contention between competing or incompatible or asymmetrical forces: industrial, extractive power and a force that cannot be fully seized by economic capture nor its archiving. Hence the event of photography,[301] as resulting from the deployment of practices and technologies by industrial power in its efforts of elucidation, would also be the event of a material and of a qualitative differentiation and disjunction in this contention. The event of photography may be understood as inscribed in a process of diffusion in a tension with a process of dispersion, according to which the possibility of the photograph's dissonant force may be thought.

Photographic heterogeneity may therefore be described as a multiplicity of fragmentary elements. Fragmentary material multiplicity may be thought from the perspective, not of the static notion of a document as record, but from that of the diffusion of a heterogeneous multiplicity of documents that is inscribed in the operations of a network or *dispositif*, sometimes expressing its efficacy, while other times revealing its dysfunctionality or vulnerabilities. The notion of *dispersion* may be used to think of photographic detail (or a singled out figure or even a singled out photograph) from the perspective of the force of elements that may escape the normative mechanisms of power, resulting in a form of dispersion: "a nomadic and dispersed multiplicity"[302] refers to those elements (subjects, bodies) which remain "untamed [and] not subject to hierarchizing structures" of power.[303] One proposes that affects resulting from the encounter with a document may be thought of in terms of an infinitesimal resistance, de-stabilisation, and dispersion occurring via the intervention of an interpreter's body or of a multiplicity of possible interpreters.

One may also consider photographic heterogeneity through the question of scale. The corporation's efficacy at producing knowledge about the accident may rely on the capacity of the

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[301] From the planning to the capture, editing, and various stages of dissemination of the photograph.
[302] Michel Foucault, "Theatrum Philosophicum," in *Language, Counter-memory, Practice: Selected Essays and Interviews*, ed. Donald F. Bouchard (Ithaca, NY: Cornell University Press, 1977), 185.
[303] Erinn Gison, "Multiplicity," in *CFL*, 305.

photographic medium to document the same reality at different scales of visual representation, from microscopic documentation to forms of recording mimicking human vision, e.g., medium format photography, such as in the examples considered in this chapter. While variations in the scale of photographic representation may be discussed as relating to the processes of abstraction characteristic of capitalism,[304] they may be problematised through the notion of visual and material multiplicity and the effects of strategies of power. One may interpret (industrial) power's ability of resorting to varying scales of photographic representation as the dual expression of (industrial) power's efficacy and its inefficacy or dysfunctionality in the face of the unpredictable.

Hence, in the photographic documentation of an accident's aftermath we can start to see the record of a precarious milieu, in which a worker or group of workers have been exposed to an excessive level of risk. While one can read the following image from the perspective of the forensic gaze and operations that led to its production, one starts to pay increasing attention to the damaged dimension of the environment recorded: the fissures left by various impacts, a darkening of the rock surface due to the excessive heat of an explosion, the leftovers of a broken wooden prop or frame, a geology structured by a destructive force. The photograph becomes the document of a damaged or defunct apparatus while hinting at the violence experienced by the bodies caught in its operative failure.

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[304] Andrew Fisher, "On the Scales of Photographic Abstraction," *Photographies* Vol. 9, No. 2, (2016): 203–214.

Figure 58. Photographer unknown, "Untitled," c. 1968.
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.
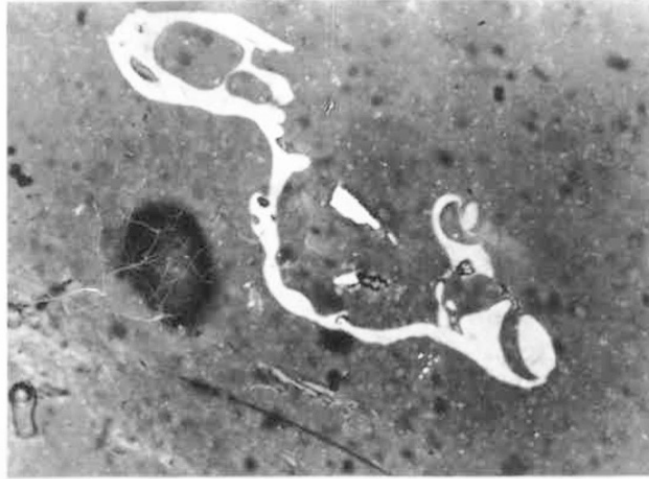
2.
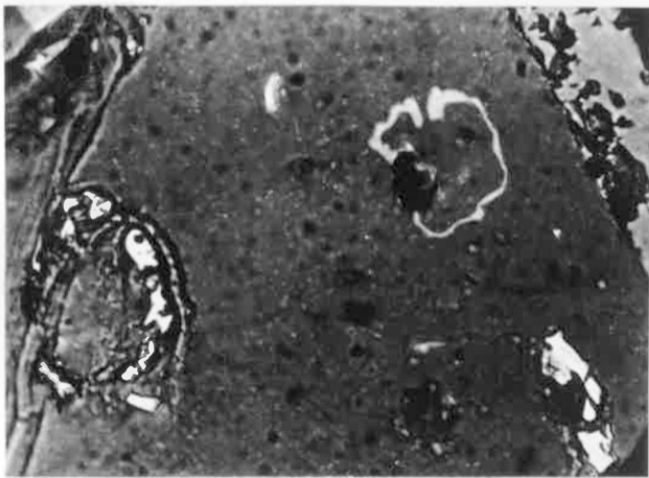
4.
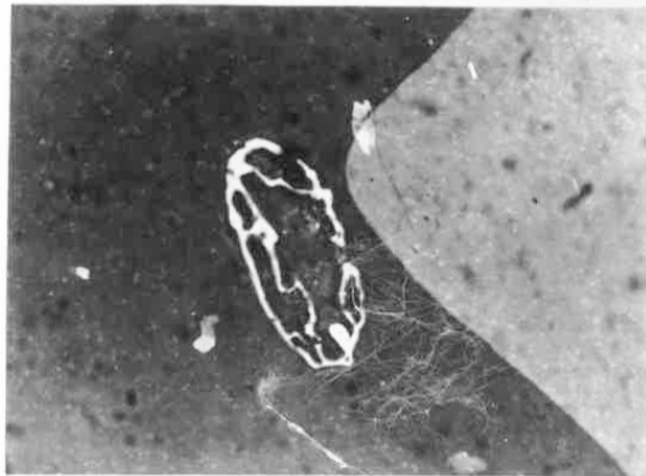
6.

Figure 59. Photographer unknown, "Etude des Cénosphères (detail)," c. 1968.
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

ETUDE DES CENOSPHERES

ACCIDENT DE PETITE ROSSELLE
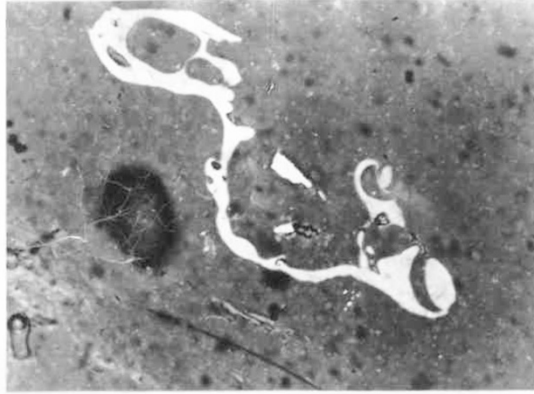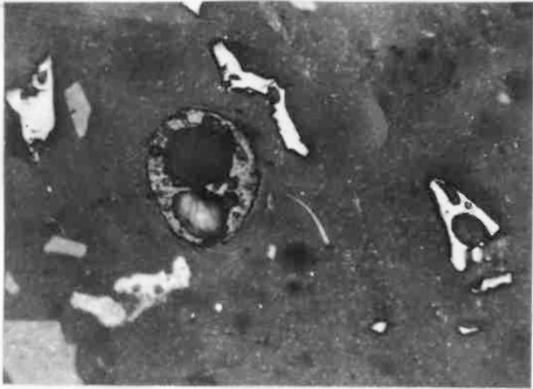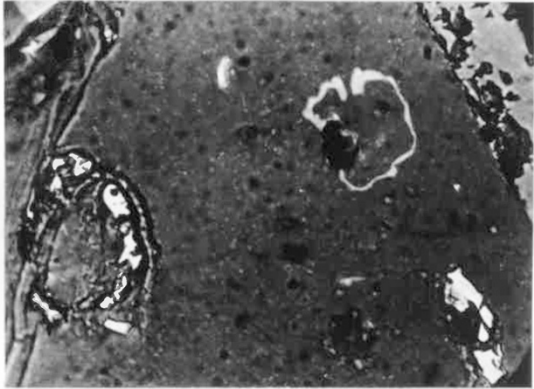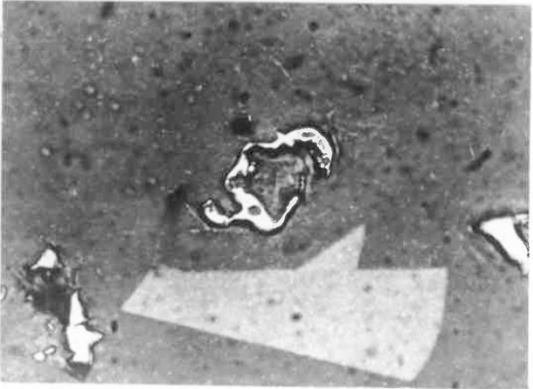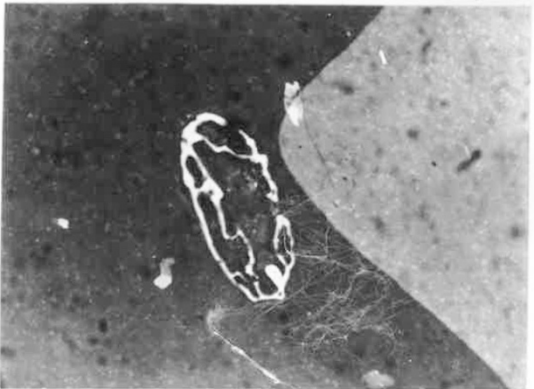
Figure 60. Photographer unknown, "Etude des Cénosphères," c. 1968.
Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

Chapter 4

The Work Accident, Photography, and the Infrastructures of Extraction
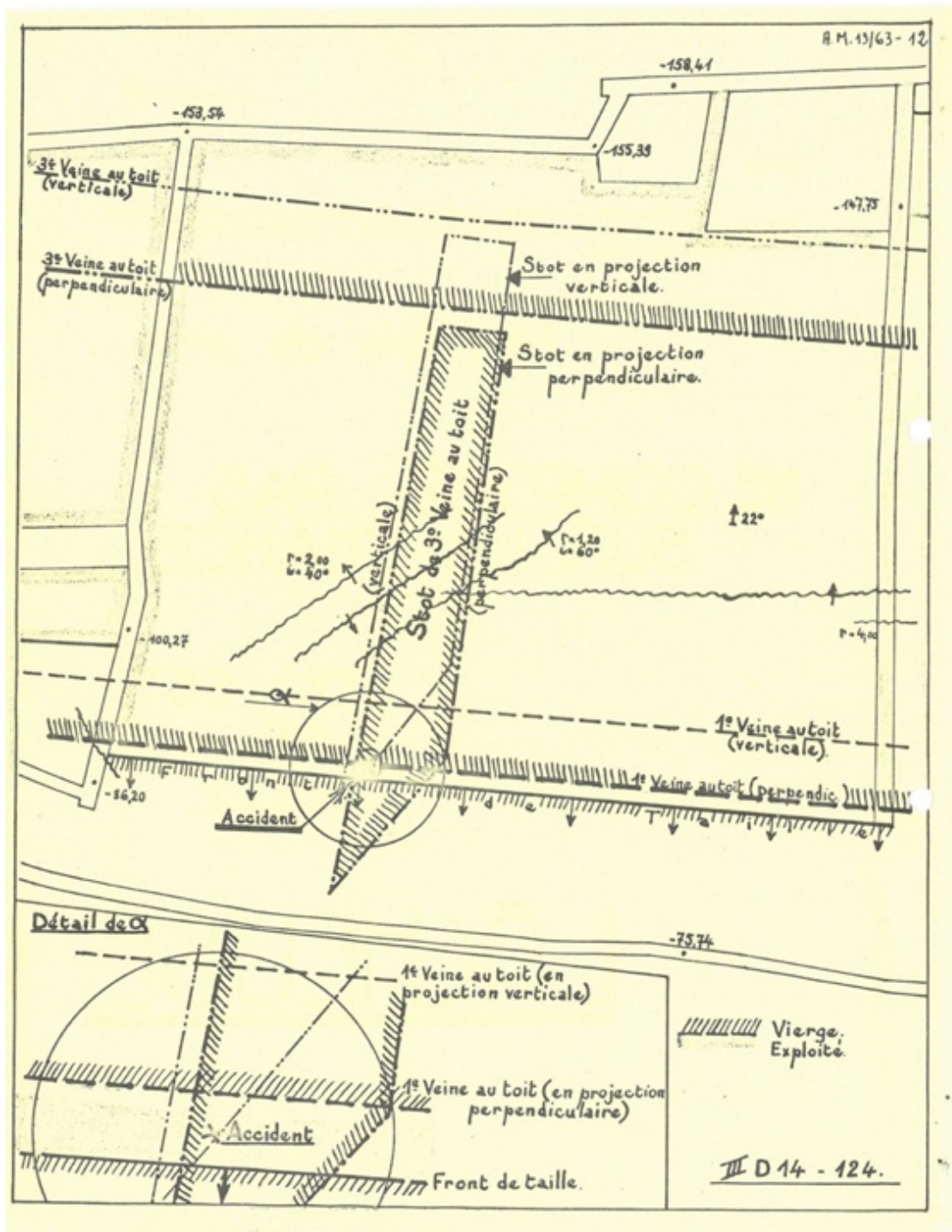
Figure 61. Diagram 1. Artist unknown, "Untitled [fatal accident 13/63]," c. 1963.
Diagram originally © HBL. Public domain. Reproduced courtesy of CAITM.

1. The photograph presents itself as image and fragment not as infrastructure: thinking the photograph infrastructurally

1.a. Extraction and the referent: infrastructural situatedness of the photographic surface

Whatever it grants to vision and whatever its manner, a photograph is always invisible: it is not it that we see.

Roland Barthes, 1981.[305]

The *noeme*[306] of Photography is simple, banal; no depth: 'that has been.' […] I must therefore submit to this law: I cannot penetrate, cannot reach into the Photograph. I can only sweep it with my glance, like a smooth surface. The Photograph is flat, platitudinous in the true sense of the word, that is what I must acknowledge. […] If the Photograph cannot be penetrated, it is because of its evidential power.

Roland Barthes, 1981.[307]

Photography does not just repeat Barthes's X—the thing that was there. It constantly points to the present-but-not-apparent, to those multiple substrates beneath the image. Photography is thus infrastructural precisely in its layered indexicality.

William Fysh, 2020.[308]
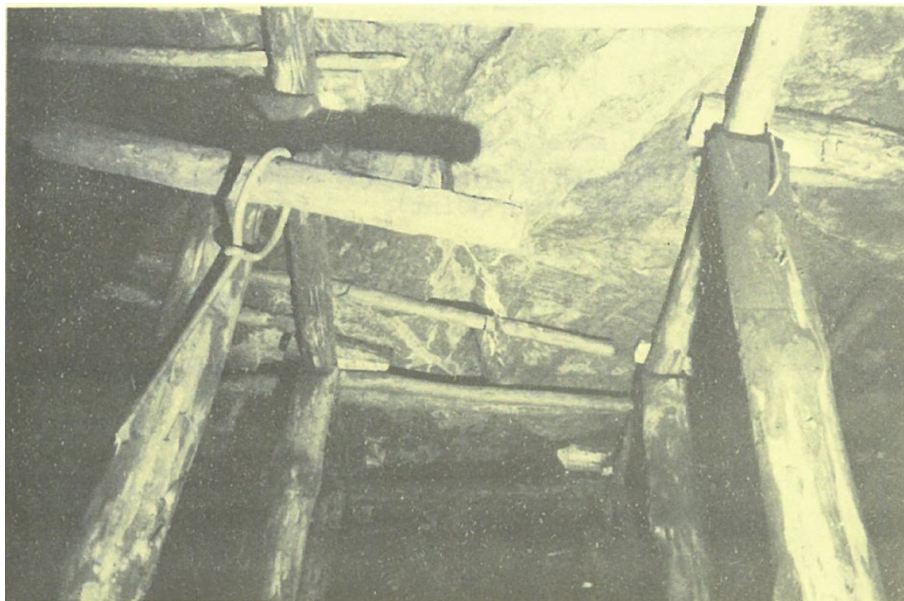
Figure 62. Photographer unknown, "Untitled [fatal accident 13/63]," c. 1963. Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

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[305] Barthes, *CL,* 6.
[306] From ancient Greek *νόημα* thought, used in linguistics to refer to "a meaning or concept as an aspect of a unit of speech." *Lexico, Oxford English Dictionary,* 2022.
[307] Barthes, *CL*, 105-106.
[308] William Fysh, "Infrastructures of Light: Tropicapitalism and Germaine Krull's Camera," *Photography and Culture* 13:2 (2020): 176.

I return to accident 13/63 (discussed in Chapter 1)[309] and to the two dimensions of the photographic documents that for me had gained a jarring and arresting quality: their flatness and their silence. That is, their characteristic of being two-dimensional objects and the fact that they do not or cannot record sound. Both aspects point to the very *reduction*, *abstraction,* and *objectifying* at work in the photograph, in the process of making the scene recorded an image, as well as to photography's technological singularity (characterised by specific technical capacities). It may seem evident to state that a two-dimensional rendition of the three-dimensionality of a recorded environment operates a form of reductive transposition (flattening), while the photograph also excludes any information relating to such environment's sonic textures and any other non-visual sensory dimensions that may characterise it when experienced in situ, at the moment of, and beyond photographic capture. As well as effecting a transposition of three-dimensionality onto a two-dimensional plane, the photograph operates a separation of sensory facts, so to speak, by isolating vision from other sensory dimensions while producing an artificial form of visuality.[310] While common doxa perceives the photograph as stilling time, the photograph's rendering of spatial attributes and its enacting a form of autonomisation and spatialisation of sight may be overlooked.[311] The photograph is more commonly associated with a mythology of stilled temporality, while the fact that it results in a reduction of the multi-dimensional complexity of the milieu from which it emerges may attract less attention. The present section proposes to consider such reduction from the perspective of an infrastructuralist problematisation of photography.

Furthermore, the reader is offered to *view* an image, and though such image is delimited by specific material boundaries and endowed with various physical characteristics (e.g., frame, surface, materials, dimensions, thickness, suppleness, polychromatic or monochromatic spectrum, etc.), when one is given to view it, it is not the photograph – as *object* – that one sees. It is, according to Roland

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[309] A fatal accident linked to the collapse of a roof layer. See "Fiche d'Accident Mortel 13/63."

[310] While I am considering here the reduction of sensory of dimensions effected by the photograph with regards to the recorded milieu, one may engage with sonic textures encountered in one's interaction with photographs. For Tina M. Campt "listening to images" constitutes at once "a description and a method" corresponding to "a heuristic for attending to the lower range of intensities generated by images assumed to be mute. Redirecting Ariella Azoulay's evocative proposal to 'watch' rather than look at photographs […], the choice to 'listen to' rather than simply 'look at' images is a conscious decision to challenge the equation of vision with knowledge by engaging photography through a sensory register that is critical to Black Atlantic cultural formations: sound." See Tina M. Campt, *Listening to images* (Durham: Duke University Press, 2017), 5 and 8.

[311] Jonathan Crary interprets the isolation of sight from other sensory capacities, which he termed "the autonomization of sight," as linked to the "industrial remapping of the body in the nineteenth century." According to him it constituted "the historical condition for the rebuilding of an observer fitted for the tasks of 'spectacular' consumption." In Jonathan Crary, *Techniques of the Observer: on Vision and Modernity in the Nineteenth Century* (Cambridge, Mass.: MIT Press, 1992), 19.

Barthes, the adherence of the referent – the scene or object imaged or simulated by way of the photograph – that makes it difficult to focus on photography and to see the photograph. The image, of which the photograph is understood to be the material substrate, is quickly assimilated, or incorporated, seemingly becoming one with one's apprehension:

> A specific photograph, in effect, is never distinguished from its referent (from what it represents), or at least it is not immediately or generally distinguished from its referent (as is the case for every other image, encumbered - from the start, and because of its status - by the way in which the object is simulated): it is not impossible to perceive the photographic signifier (certain professionals do so), but it requires a secondary action of knowledge or of reflection […] Whatever it grants to vision and whatever its manner, a photograph is always invisible: it is not it that we see. In short, the referent adheres. And this singular adherence makes it very difficult to focus on Photography.[312]

While Barthes highlights the need for "a secondary action of knowledge or reflection" to perceive the photograph as *signifier*, one may add that it may take a tertiary form of reflective action to pay attention to and analyse the photograph as material object, as the product of labour, and as infrastructure – i.e., to highlight its social ontology, or the "social-relational framework"[313] in which it is produced and in which it exists. Elsewhere, Barthes refers to the photograph as the fruit of a process of ex-pressing ("like the juice of a lemon") but does not engage in a materialist analysis of such process, which remains naturalised as a form of physics divorced from human labour:

> It seems that in Latin "photograph" would be said "*imago lucis opera expressa*"; which is to say: image revealed, "extracted," "mounted," "expressed" (like the juice of a lemon) by the action of light.[314]

A detailed critique of *Camera Lucida* (1980) lies outside the scope of the present chapter which does not so much take aim at Barthes' essay as offer to consider the value of an *infrastructuralist* problematisation of the photograph that allows one to consider the so-called flatness and impenetrability of the photographic surface from the perspective of the infrastructural determination of such a surface. At a certain infrastructural scale, the photograph's flatness and impenetrability may therefore be perceived as fact or "law," while at a different scale, such characteristics may be understood as perceptually relative, or the product of *norms*, normalised schemas of thought, or rationalities. Furthermore, such reading proposes to re-interpret the photograph's "evidential power," not as a quality inherent to the photograph, as if pertaining to a so-called "essence," but as enacting a form of *effect* pertaining to a wider economy of *power relations* (material and virtual) and

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[312] Barthes, *CL,* 5-6. Note that "extracted" is an inaccurate translation of the French "sortie" used by Barthes: "Il paraît qu'en latin « photographie » se dirait : « imago lucis opera expressa » ; c'est-à-dire : image révélée, « sortie », « montée », « exprimée » (comme le jus d'un citron) par l'action de la lumière. " Roland Barthes, *La chambre claire: note sur la photographie* (Paris: Cahiers du Cinéma / Gallimard Seuil, 1980), 127.
[313] Roberts, *Photography and its Violations*, 3.
[314] Barthes, *CL*, 81.

of *power effects*.[315] That is, power relations enacted through material relations (such as labour relations or relations of production) and through virtual schemas (such as rationalities, hierarchies, or value systems translatable diagrammatically).

An infrastructuralist reading posits the photograph as embedded in a wider system or stratified ensemble that may be referred to as an *infrastructural environment or ecosystem*, i.e., that of the archival-industrial complex, itself embedded in the wider infrastructural ecosystem of extraction. The latter may be referred to as the socio-technical environment within which a corporation's practices (including photography) are embedded. Such an interpretation engages with the photograph's "layered indexicality," to borrow William Fysh's words, understood from the perspective of the infrastructural situatedness of the apparatus and practice of photography. Infrastructures are often referred to as "a system of substrates" with reference to Susan Leigh Star's seminal work[316] in the ethnography of information systems.[317] Forming the background for all kinds of work, infrastructures are often invisible and ready-to-hand[318] and become visible upon breakdown.[319] The anthropologist, Brian Larkin offers a more complex picture of infrastructures' link to visibility by arguing for a range of visibilities from the unseen, to the quasi-spectral, defective infrastructure, to the grand spectacle (enacting a form of political statement).[320]

Star highlighted that "infrastructure is a fundamentally relational concept," calling for an ecological form of analysis,[321] i.e., a form of analysis emphasising the relational dimension of a system.[322] Star's interest in the subject stemmed from the study of the understudied which led to an "ecological understanding of workplaces, materiality, and interaction" and "underpinned a social justice agenda."[323] The study of infrastructures has taken shape in a variety of academic disciplines, from anthropology, to science and information studies,[324] histories of modernity,[325] geography, digital

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[315] See Chapter 3 for a dispositival analysis of photography's inscription in an economy of power relations.
[316] Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42, no.1 (2013): 329.
[317] Susan Leigh Star, "The Ethnography of Infrastructure," *American Behavioral Scientist* 43, no. 3 (November 1999): 380.
[318] Such as "railroad lines, pipes and plumbing, electrical power plants, and wires." In Star, "The Ethnography of Infrastructure," 180.
[319] Star, "The Ethnography of Infrastructure," 382.
[320] Larkin, "The Politics and Poetics of Infrastructure," 336.
[321] Star, "The Ethnography of Infrastructure," 379 and 380.
[322] "According to Susan Leigh Star and Karen Ruhleder, infrastructure encompasses both technical bases and social arrangements, extends beyond single events and sites, connects with existing practices and standards, and must be learned and naturalized over time by users. As such, infrastructure is fundamentally a relational concept rather than a concrete object [...]" In Lisa Parks and Nicole Starosielski. "Introduction," *Signal Traffic: Critical Studies of Media Infrastructures* (Urbana: University of Illinois Press, 2015), 9.
[323] Star, "The Ethnography of Infrastructure," 379.
[324] For an overview see Larkin, "The Politics and Poetics of Infrastructure," 330.
[325] See for instance Paul N. Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," in *Modernity and Technology* (Cambridge, MA: MIT Press, 2003), 190.

humanities, media studies,[326] and art practice.[327] John Durham Peters[328] coined the term Infrastructuralism to refer to "a doctrine of environments and small differences, of strait gates and the needle's eye, of things not understood that stand under our worlds."[329] According to Larkin, historical antecedents to infrastructure studies are found for instance in the work of Karl Marx, Sigmund Freud, and Michel Foucault.[330] More recently, working at the intersection of geography and cultural anthropology, Anand et al. highlight the politics of infrastructures by defining them as "critical locations through which sociality, governance and politics, accumulation and dispossession, and institutions and aspirations are formed, reformed, and performed."[331] Hence, as Paul N. Edwards pointed out in analysing their significance to Modernity, infrastructures are to be understood as socio-technical systems,[332] i.e., as heterogeneous ensembles best understood through the concept of technopolitics. Through the latter, scholars have sought "to trace out the material operation of […] technologies and the ways in which this materiality has consequences for political processes."[333] A technopolitical analysis of infrastructure is reminiscent of Foucault's analysis of the *dispositif* (see Chapter 3). Larkin, while referring to Foucault's lectures *The Birth of Biopolitics: Lectures at the Collège de France, 1978-1979,* remarks that infrastructures "reveal forms of political rationality that underlie technological projects, and which give rise to an 'apparatus of governmentality'."[334] Where governmentality may be understood in a broad sense to encompass state-based governmentality as well as the governing of workers by a corporation for instance.

1.b. The photograph as interface in the regime of extraction: the logistical image

From beholding to holding the photographic object, it would take a simple act of distanciation from visual apprehension to make oneself aware that what is not visible (in the examples considered by this research), for it is not recorded *as image*, or imaged, and therefore obscured from our

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[326] See for example: Jussi Parikka, *A Geology of Media*. Minneapolis, Minnesota (University of Minnesota Press, 2015); and John Durham Peters, *The Marvelous Clouds: Toward a Philosophy of Elemental Media* (Chicago: The University of Chicago Press, 2015).
[327] See for instance, Samir Bhowmik and Jussi Parikka, "Memory Machines: Infrastructural Performance as an Art Method," *Leonardo* 54, 4 (2021): 377–381.
[328] Peter's work marks a renewed interest in the ecology of media and acknowledges the seminal work of Susan Leigh Star and Geoffrey Bowker in *Sorting Things Out* (1999).
[329] Peters, *The Marvelous Clouds,* 33.
[330] Larkin, 332; see also Peters, 37 and 34.
[331] Nikhil Anand, Akhil Gupta, and Hannah Appel, eds, *The promise of infrastructure* (Durham: Duke University Press, 2018), 3.
[332] Edwards, "Infrastructure and Modernity," 188.
[333] Larkin, "The Politics and Poetics of Infrastructure," 328.
[334] Larkin here refers to Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978—1979* (New York: Picador, 2010), 10. In Larkin, "The Politics and Poetics of Infrastructure," 328.

consciousness, is the camera's and its operator's very inscription in the scene captured, and in the wider ensemble of the archival-industrial complex in the regime of extraction. The photograph simultaneously records and conceals. Kevin Coleman and Daniel James point out that: "[...] what is unique about photography is that it, as a medium, can hide the origins of its own production. [...] The result is a photograph that simultaneously represents a social world and obscures how that world is made."[335] The present research not only sheds light on the world of mining, but it also situates the photograph *in* the regime of extraction, *infrastructurally* and *politically*. Hence, the photographic documentation of an accident's aftermath represents the (disrupted) site of extraction-production, while the fact that the photograph is itself inscribed in the latter's wider system or material economy, i.e., as the fruit of a form of labour[336] and as industrial infrastructure, may not be perceived.[337] That is, as a form of infrastructure through which resources are mobilised – minerals, electricity (flash), labour, and other materials such as paper – to fabricate an object, the substrate of an image, enabling the transit of (visual) information in the networks of the corporation. One may say that the image or *image-effect* resulting from photographic capture forms a kind of visual screen which may distract or divert the viewer from the photograph's technological armature, from its physical constitution, and from the wider apparatus that subtends its existence. The *reduction* at work in the photograph may therefore be qualified as a reduction of the infrastructural multi-dimensionality of the context of extraction.

It may be argued that photography's ubiquity and banality have obscured its infrastructural ontology. The industrial photograph may be understood as a logistical image. That is, put simply, as a carrier of information from one point in space and time to another, thus creating informational pathways or relations between entities, groups, or individuals. In his discussion of a collection of coal mining photographs from Cape Breton, Allan Sekula presents the notion of a "traffic in photographs:"

> We are confronting a curious archive—divided and yet connected elements of an imaginary social mechanism. Pictures that depict fixed moments in an interconnected economy of flows: of coal, money, machines, consumer goods, men, women, children. Pictures that are themselves elements in a unified symbolic economy—a traffic in photographs—a traffic made up of memories, commemorations, celebrations, testimonials, evidence, facts, fantasies.[338]

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[335] Coleman and James, "Introduction: Capitalism and the Camera," 12-13.

[336] On photography and labour see: Kevin Coleman, Daniel James, and Jayeeta Sharma, "Photography and Work," *Radical History Review* 132 (2018): 1-22; Erica Toffoli, "Alienating Exposures: Photographing the Activity of Labor," *Photography and Culture*, 13:2, (2020): 197-211.

[337] On photography as a system infrastructural to capitalism and colonialism see: Fysh, "Infrastructures of Light," 175-196; for a historical overview of the becoming infrastructural of photography from the 19th century to the digital era, see Mitchell Schwarzer, "From Sewers to Selfies: the Evolution of Photographs into Infrastructure," in *Picturing America: Photography and the Sense of Place*, eds. Schmidt, Kerstin, and Julia Isabel Faisst (Leiden: BRILL, 2018), 12-31.

[338] Sekula, "Photography between Labour and Capital," 201.

From Sekula's notion of traffic Alberto Toscano derives that of "the logistical image" as an image "considered primarily in its informational functionality, as an element in a concatenation of actions, or in a flow, which is ultimately not different in kind from other logistical components (charts, material, transport, etc.)."[339] The notion of a logistics of photography emphasizes the instrumental functionality of photographs as enabling flows of information or as coordinating actions in an infrastructural ensemble. A logistics of photographic vision[340] therefore surpasses the notion of photography as a strictly representational medium, and is reminiscent of Peter's analysis of media:

> "Infrastructuralism suggests a way of understanding media as fundamentally logistical. […] The job of logistical media is to organize and orient, to arrange people and property, often into grids […] They both coordinate and subordinate, arranging relationships among people and things. Logistical media establish the zero points where the x and y axes converge."[341]

The obscuring of the logistical dimension of photographs may not only be due to the photographic image's uncanny resemblance to its referent, but also to the fact that the photographic object may be perceived as a free-floating fragment rather than as an *interface*. As noted by Peters, "[t]hough large in structure, infrastructures can be small in interface […]" and such interfaces act as "gates to bigger and submerged systems."[342] The photographic object is naturalised as image rather than being perceived as infrastructural to a system or set of practices that are bound to the milieu imaged (i.e., the site of extraction in the examples considered by this research). While the photograph of a work accident is indeed produced (by the corporation) *among* the infrastructures it records, its process[343] necessitates that it be dislocated from the milieu in which it is captured for its logistical function (transmitting information) to be performed. The photograph may therefore be perceived as disconnected from the infrastructures it appears to *contain* within its frame. Furthermore, since photographic practice results in a product that distinguishes itself from the core commodity of extraction (i.e., coal), it is not understood as embedded in the instruments of the extractive complex.

The image, of which the photograph is understood to be the substrate, may be re-envisioned as resulting from the interaction of at least two systems: that of the photograph as material object and the stratified networks of photographic representation (e.g., the archival-industrial complex), and

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[339] Alberto Toscano, "The Mirror of Circulation: Allan Sekula and The Logistical Image," *Society and Space*, 31 July 2018, https://www.societyandspace.org/articles/the-mirror-of-circulation-allan-sekula-and-the-logistical-image.

[340] For a discussion of the logistics of perception see also: Paul, Virilio, *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller (London: Verso, 1989).

[341] Peters, *The Marvelous Clouds,* 37.

[342] Peters, 31.

[343] All examples considered by this research were produced via analogue photograph which operated through a negative-to-positive process requiring two development stages – the processing of a 'latent' image to a film negative and the inversion and enlargement of a negative to a printed 'positive.' This process occurs in a different site from the site of capture and the logistical phase of the photograph's function operates via infrastructural routes that dislocate the image from the site of its process.

that of what could be referred to as the system of bodily capacities that include physiological vision and associated mental functions. Hence, one may say that the effects of photographic surfaces are dependent upon the mobilising or marshalling of physiological capacities upon which corporeal vision and cognitive activity depend. Hence, when used in the context of training, disciplining, or the production of various forms of knowledge about accidents, the photograph may be understood to enable a marshalling or a worker's corporeal vision and cognitive abilities by the industrial corporation via the technology of documents in order to govern them.

2. The work accident as infrastructural event: instrumentality of the photograph and of labour in the political anatomy of extraction

2.a. Inversion as method, inversion as event

An infrastructuralist interpretation of the photograph and of the photographic apparatus may therefore help to problematise the *image-effects* of photography as *surface-effects* by asserting the photograph's infrastructural condition, and to *situate* the photographic document in the multi-dimensional and multi-layered infrastructural system of extraction, as pertaining to an economy of relations between workers, the entity of the corporation, and the natural environment. As the field of extraction-production, of which the topography of the accident is a part, is inscribed as *image* within the field of visibility produced through the photograph and the wider corpus of photographs that form the corporate archive, it may be perceived as external to the camera and as the *object* of photography. An analysis of the inscription of photography within the extractive system of the corporation as a practice and technique coextensive to extraction (as the process of extracting resources as well as that of extracting value from labour) therefore demands to *inverse* this (mis)perceived relation and to emphasize the relational and material economy of which photography is but one element. *Inversion*,[344] as a methodology, allows one to perceive that the field of extractive production (e.g., mining) is not simply the object or subject matter of the photograph, *it is the field of instrumentality* that incorporates workers (who may be or may not be photographed), the photographer and the camera, in *a system of instrumental co-operation*[345] with all other extractive infrastructures necessary for its operativity. Therefore, an infrastructuralist analysis of the photograph

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[344] In Chapter 3, I invoked the method of genealogical inversion put in practice by Michel Foucault in *Discipline and Punish* (1975).
[345] Understood as linked or correlated operation.

and its apparatus is bound to an infrastructuralist analysis of labour and of the instrumental status of workers.

Such an analysis therefore also aims to highlight the political anatomy of the extractive system of the corporation in which photography is inscribed, at the level of detail as well as that of wider ensembles. The analysis of the political anatomy of a system is a form of study that is "concerned with the 'body politic', as a set of material elements and techniques that serve as weapons, relays, communication routes and supports for the power and knowledge relations that invest human bodies and subjugate them by turning them into objects of knowledge."[346] While indebted to the method introduced by Michel Foucault in *Discipline and Punish* (1975), this research refers to the notion of political anatomy in a wider sense to include the study of the embeddedness of bodies and technical objects, or apparatuses, such as photography, in the biopolitics of extraction and from the perspective of the re-envisioning of infrastructures via the multi-disciplinarity of infrastructural studies.[347] As previously discussed, the accident constitutes a *strategic* problem for industrial power in that it disrupts the continuity of the corporation's extractive operations. The deployment of means of representing the accidents (in forensics, techno-scientific experiments, and communications) was discussed as a form of tactical strategy on the part of the corporation. A biopolitics of industrial power aims for productive continuity or homeostasis and the containment of aleatory events and threats to the working body or to the collective body of the working population (see Chapter 3). Hence, one ought to consider the deployment of photography as a form of *infrastructural intervention in the regime of extraction* in response to *the infrastructural disruption effected by the work accident*, or, considered from a different perspective, the *infrastructural dysfunction* resulting in such accident. This means to consider the work accident as an *infrastructural event* in the political anatomy of extraction.

Hence, the photographic documentation of an accident's aftermath does not simply constitute a record of damaged resources, but as a process it is *infrastructurally linked* to the infrastructural disruption and recombination effected during the work accident. The latter may be understood as affecting material apparatuses as well as the domain of relations.[348] The accident puts demands on the extractivist system and calls for the infrastructural intervention of documentation and representation. One may say that the photographic document's *infrastructural genealogy* is

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[346] Foucault, *DP*, 28.

[347] As mentioned previously, infrastructure studies have taken shape at the convergence of a variety of disciplines, from anthropology, science and information studies, histories of modernity, geography, digital humanities, media studies, and art practice.

[348] "Analytically, infrastructure appears only as a relational property, not as a thing stripped of use." Susan Leigh Star and Karen Ruhleder, "Steps toward an Ecology of Infrastructure," *Information Systems Research* 7, no. 1 (March 1996): 113.

intrinsically linked or entangled to that of the work accident. While it may be understood as documentation, the photograph is analysed as a tactical intervention responding to a failure. In the event of the accident the risks and vulnerabilities underlying the continuity of flows enabled by the machine of extraction become visible. As noted by Star, infrastructures become "visible upon breakdown."[349] Where infrastructures ought to be understood beyond a reductive technicist definition, as socio-technical, and as a form of social organisation. Paul N. Edwards points out that infrastructures and society are treated as ontologically separate and social causes of infrastructural breakdowns are rarely invoked.[350] Therefore, one may say that it is the organisation of the workforce via a system of excessive power asymmetry which becomes visible by way of the work accident, and its documentation.

Hence the material apparatuses or instruments of extraction that are visibly damaged and photographically documented constitute only one dimension of the wider infrastructures of extraction which also include institutional practices and rational schemas, such as the ideology of surplus-value, the scientific management of work subtending specialisation and mechanisation, the normalisation of risk, the biopolitical governing of health and ill-health, the alienation of workers from their own labour, the total objectification of the natural environment, ... The sense of shock or horror that one may experience at the sight of an accident's aftermath, while stemming from the vision of destruction mediated by the photograph and the knowledge that a worker or several workers may have lost their lives, may lead to the understanding that such level of destruction is only possible due to the extreme precarity of the milieu[351] in which the accident took place and to which workers were subjugated to. Damage and destruction ought to be understood as occurring not by chance, nor resulting solely form the actions of workers, but as resulting from the precarity of the extractive milieu, which satisfies economic strategies implemented by the corporation and reflects negligent organisation.[352] One may say that the *practice* of normalising work accidents as acceptable damage in the wider balance of the corporation's costs, and the calculated poverty of means that photographic intervention constitutes, reflect specific strategic choices. One ought to view the mangle of damaged bodies, machinery, and geology documented by the corporate archive as the result of a form of organisation or ecosystem, albeit in a temporarily defunct state. A form of organisation where a

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[349] Star, "The Ethnography of Infrastructure," 382.
[350] Edwards, "Infrastructure and Modernity," 390.
[351] Recall the use precarious wooden props gradually built by miners as the coal front advances. A practice that was still in place in the 1960s as evidenced by the files studied here.
[352] Paul N. Edwards highlights the remarkably low accident rates in commercial air transport as reflecting "the success of vigilant organizations, legal apparatus, and social learning about accidents." Edwards, "Infrastructure and Modernity," 190.

certain degree of destruction fits the political economy of extraction and its predatory, risky economics.

Building on Judith Butler's notion of an extended instrumental materiality of war of which photography would be a part,[353] Lee Mackinnon derives a materialist theory of the photograph which would assert the photographic image's ontological dimension (its existence as a material being) over its status as representation.[354] Mackinnon notes that Butler, while pondering upon how the camera becomes an instrument of war, asks "what happens if instruments acquire their own agency, such that persons become extensions of those instruments."[355] This speculation prompts Mackinnon to propose a model of agency whereby all constituent parties, human and non-human, comprising an event or process (such as the photographic event), are endowed with agency. In Butler's chain of thought, and by extension in Mackinnon's, there is therefore a conceptual connection between instrumentality and agency. Agency may be understood here as the (instrumental) co-operation or co-operativity of humans and non-humans in the realisation of a material process beyond the binary subject-object: "Subject and object become indistinguishable facets of a material process."[356] Mackinnon acknowledges antecedents of a materialist reading of the photograph in the field of anthropology (namely in the work of Elizabeth Edwards and more broadly in the subfield of Material Culture),[357] while her indebtedness to Marxian theory, which she complements with post-colonial analysis, remains implicit. Mackinnon notes how "the photographic apparatus of the camera bears the inscription of global divisions of labour and wealth" upon which its existence is premised and is enmeshed in the mobilisation of bodies "into systems of value, race and class […] in recent permutations of corporate colonialism."[358] While the history of photographic technologies is intrinsically linked to that of silver mining,[359] the photographer, and the broader photographic apparatus, are mobilised into the system of archival-industrial infrastructures co-extensive with industrial extractivism.

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[353] Judith Butler, *Frames of War: When Is Life Grievable?* (London: Verso, 2009), xi.

[354] Lee Mackinnon, "Toward a Materialist Photography: The Body of Work," *Third Text* 30, no. 3-4 (2016): 154.

[355] Butler, *Frames of War*, xi.

[356] Mackinnon, "Toward a Materialist Photography," 154.

[357] Elizabeth Edwards and Janice Hart, *Photographs Objects Histories: On the Materiality of Images* (London and New York: Routledge, 2004); Elizabeth Edwards, "Photography and the Material Performance of the Past," *History and Theory* 48, no. 4 (2009): 130–50.

[358] Mackinnon, "Toward a Materialist Photography," 154.

[359] For a discussion of the interrelated histories of (silver) mining and photography see: Siobhan Angus, "Mining the History of Photography," in *Capitalism and the Camera: Essays on Photography and Extraction*, eds. Kevin Coleman and Daniel James (London; New York: Verso, 2021), 55-73.

To consider subject and object as instrumental facets of the same material process is to acknowledge their *inter-related* inscription in the wider field of instrumentality established by capitalist modes of production, in a lineage of thought indebted to a Marxian labour theory of value that emphasised the incorporation of human labour in the metabolism of production.[360] Hence, when proposing a materialist reading of the photograph, one is emphasizing the inscription of the photograph, its apparatus, and of the photographer in a field of instrumentality in which the worker has been incorporated as resource alongside the natural environment which has been essentialised as a source of "raw" materials. Suggesting that subject and object are indistinguishable facets of a material process should lead to emphasizing *the politics of the instrumentalisation of humans*, through techniques of discipline and coercion (such as implemented in the context of waged labour). The photograph is not only the document of, but has also been a contributing factor to, such instrumentalisation (through its logistical role in the corporation and by objectifying the worker through photographs). That is, a document as well as an instrument of the infrastructural status of humans as workers in the regime of extraction, to the point of their obsolescence or even that of the normalisation of their death at work. The term *worker* may therefore be considered to refer to an instrumental or infrastructural modality of being.[361] It may be argued that the work accident constitutes the symptom of the infrastructural status of workers.

Furthermore, the work accident ought to be considered as an ecological event with damaging consequences for workers as well as for the 'working' environment which is treated as pure resource by extractivist production. For instance, while damage to workers and the material instruments used in extraction are discussed in accidents reports, damage to the geological environment is neutralised via strict denotative reference (e.g., measurements, direction of planes, type of rock strata, geological structure, etc.). One may say that the human worker has been objectified as much as the environment from which they have been ideologically dissociated. While Mackinnon's emphasis of the need for a materialist theory of photography is valuable, one proposes to think the notion of extended materiality and instrumentality through that of the material and infrastructural economy of extraction – thus revisiting the conceptual model of *dispositif* through an infrastructuralist lens.

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[360] Marx refers to human labour as a metabolic process in *Capital vol. 1*, 207.
[361] "People as Infrastructure" was a concept deployed by AbdouMaliq Simone in an analysis of urban collective life. See AbdouMaliq Simone, "People as Infrastructure: Intersecting Fragments in Johannesburg," *Public Culture* 16.3. (2004): 407-429.

2.b.   Biopolitical governance, labour, and the infrastructures of photography

One may argue that photographic vision constitutes a hybrid form of visuality in a relational economy in which physiological optics, mechanical optics, human agents, and objects concur and affect one another. The photographic surface is therefore understood as the interface where physiological and mechanical optics meet and compose together, with results that may serve the interests of a powerful entity such as a corporation. However, such effects may diverge from such interests due to the agency of an interpreter/viewer via practices of analysis or the force of affect. Furthermore, what may be described as the spatialisation of visual apprehension via photographic surfaces may be considered as facilitating a process of enclosure whereby physiological vision, as bodily capacity, is harnessed by various forms of power via the photograph, as a potential form of labour, albeit invisible, unrecognized, or disavowed. In this sense, the photograph may be understood to constitute an enclosure system through which natural resources (minerals, light, etc.) and bodily capacities (that of the photographed subject, the photographer, and the viewer) are marshalled. In the context of the corporation studied here, a worker's visual capacities may be considered as infrastructural to the governance of the workforce, as such capacities are marshalled through visual campaigns regarding safety and risk for instance.[362]

The anthropologist Brian Larkin, building on the work of Stephen Collier,[363] highlights how infrastructures may constitute the site of a formal rationalization pertaining to practices of government:

> Infrastructures, for Collier, are a mixture of political rationality, administrative techniques, and material systems, and his interest is not in infrastructure per se but in what it tells us about practices of government.[364]

Collier's notion of infrastructure is reminiscent of Michel Foucault's description of the *dispositif* as a heterogeneous ensemble of discursive and non-discursive entities (see Chapter 3). Larkin points out that Collier centres the question of infrastructures entirely on the question of *biopolitical* governance. In his lecture series *Security, Territory, Population* (1977-1978) Foucault defines governmentality as:

> […] the ensemble formed by institutions, procedures, analyses and reflections, calculations, and tactics that allow the exercise of this very specific, albeit very complex, power that has the population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technological instrument.[365]

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[362] As campaigns regarding safety and risk comprised images combined with text, a worker's capacity to see was marshalled along his interpretative capacities.

[363] Stephen J. Collier, *Post-Soviet Social: Neoliberalism, Social Modernity, Biopolitics* (Princeton: Princeton University Press, 2011).

[364] Larkin, "The Politics and Poetics of Infrastructure," 331-332.

[365] Foucault, *Security, Territory, Population,* 108.

The concept of governmentality is specifically linked to biopolitics here as the system allowing for a form of *governmental management* where economic processes would have precedence over processes pertaining to laws.[366] Hence while Collier may refer to governmental practices in the strict sense of the term, *governance* may be understood in a broader sense to include the corporate governance of workers for instance.

The photographic document may therefore be understood as the site of the crystallisation of particular rationalities pertaining to industrial capitalist logics and biopolitical governance. In this respect, photography as infrastructure may be interpreted as contributing to a system of (corporate) government[367] through techniques of discipline, regularisation, and normalisation aimed at securing the homeostasis which biopower strives to maintain for the smooth running of the extractive machine and the perpetuation of surplus-value. The photograph of a work accident's aftermath translates a rationalising schema or "style of reasoning"[368] and a "style of structuration"[369] whereby the role that the photograph fulfils in its evidentiary function at a discursive or communicative level may be understood at an infrastructural level to enact a form of (biopolitical) regularisation. While its infrastructural existence is correlated to the quest for temporal continuity and chronological explanation, and to the banishment of the possibility of disruption or dysfunction, of which the accident may be considered the symptom or the revelator.

Furthermore, the photograph may be understood to contribute to the governance of workers – such as via its uses in pedagogy or training or the management of workers' safety; via the channelling of workers' attention through pictorial and wider communicative means; or in the attempt to establish responsibility for accidents in forensic and legal enquiries, therefore leading to the projection of specific subject positions (the negligent worker, the guilty, the healthy subject, the injured body, the victim, etc.). When deployed in simulation experiments (such as in microscopic studies of heat damage on mineral composition)[370] photography constitutes a tactical strategy to contain, pre-empt, or prevent aleatory events. As discussed previously, one of the core problems at the centre of biopolitical strategies, is that of the accidental and the aleatory.

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[366] Ladelle McWorther, "Population," in *CFL*, 374.
[367] For a contemporary discussion of the idea of private government see Elizabeth Anderson, *Private Government* (Princeton: Princeton UP, 2017).
[368] Larkin, The Politics and Poetics of Infrastructure," 332.
[369] Discussed previously in Chapter 3 in relation to the concept of *dispositif,* with reference to Jane Bennett, *Vibrant Matter* (2010) referred to in Anderson, *Encountering Affect,* 35.
[370] See Chapter 3.

3. Infrastructural migrations, reproducibility, and infrastructural(ist) interventions

3.a. The photograph as fragment and the virtuality of the photographer: "The worker has spun, and the product is spinning"

> In the labour process […] man's activity, via the instruments of labour, effects an alteration in the object of labour which was intended from the outset. The process is extinguished in the product. […] Labour has become bound up to its object […] The worker has spun, and the product is spinning.
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> Karl Marx, *Capital*, vol. I, 1867.[371]
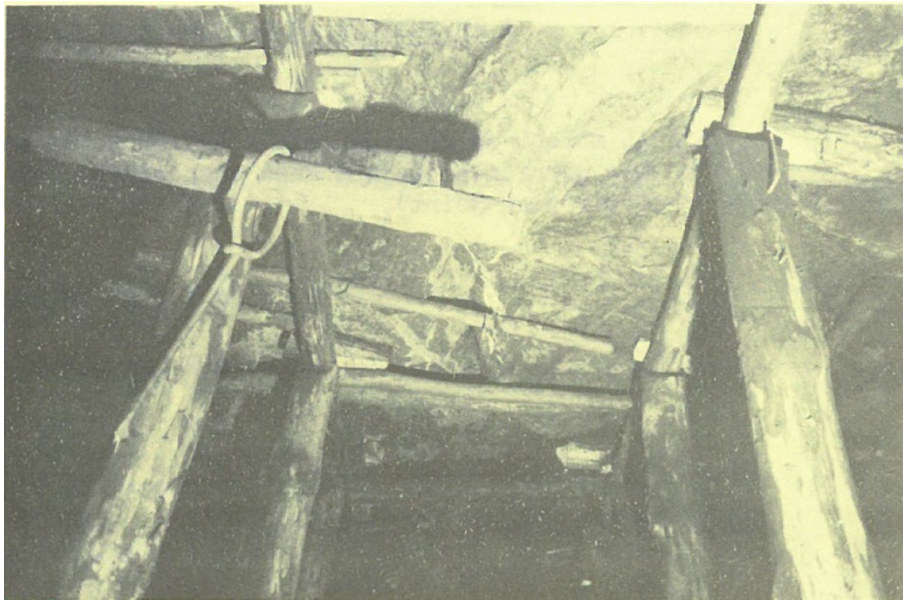
Figure 63. Photographer unknown, "Untitled [fatal accident 13/63]," c. 1963. Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

As mentioned previously, the fact that the camera and its operator(s) may not be imaged in the photographic document of an accident's aftermath, leads to concealing their inscription in the infrastructural field in which the photograph is *produced* and *embedded*. Hence, while the camera and the photographer were materially anchored in the (stilled) field of extraction, they have gained a form of virtuality in the history of such a photograph's formation, from the event of its materialisation to the epoch of its circulation, while the photograph appears to have acquired a form of autonomous

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[371] Marx, *Capital*, vol. I, 287.

presence. The non-inclusion of the image-maker within the frame of the image (such as in the image above) may be explained as the result of normalised practices of image-making necessitated by forensic recording or as an infrastructural effect (the photographer's invisibility is infrastructural to the purpose of archiving). It may however also be interpreted as linked to the wider history of photography as enmeshed with that of industrial capitalism (in the era of its industrial inception as well as in an era of increased automation of photographic mechanisms of capture). A history in which the photograph is *intended* as *product*, i.e., an object endowed with a *use-value* and with the potential of becoming a commodity, i.e., a product ascribed with an *exchange-value*, potentially on an industrial scale. A use-value bestows a product with the capacity to be inserted in relations of circulation and exchange and requires that such object be dissociated from the context of its formation, in *practical* and *formal* terms, through the extinguishing of the traces of human labour in the commodity's appearance:

> A knife which fails to cut, a piece of thread which keeps on snapping, forcibly remind us of Mr A, the cutler, or Mr B, the spinner. In a successful product, the role played by past labour in mediating its useful properties has been extinguished.[372]

The "successful product" should not appear to be "the object of a form of labour," to use Marx's terms, and the labour process should not be manifested in the product's form, or aesthetic appearance. As noted by Marx, the character of a product is such that it appears distinct from the process from which it originates *by design*: "In the labour process […] man's activity, via the instruments of labour, effects an alteration in the object of labour *which was intended from the outset*. The process is extinguished in the product (my emphasis)." The products of labour, experienced as commodities in the sphere of exchange acquire a form of objectivity whereby, they appear to be endowed with a degree of autonomy, [373] leading to the illusion that "the definite social relation between men themselves assumes here, for them, the fantastic form of a relation between things." This is what Marx, in an analogy with "the misty realm of religion," calls "the fetishism which attaches itself to the products of labour as soon as they are produced as commodities."[374] Hence, the erasure of distinctive traces of human labour from a commodity's formal appearance is the very expression of the worker's alienation from their own labour, from the fruit of their labour, and from a product's accrued (exchange)value on the world stage of commodities. One may say that the extinguishing of the labour process in the product is structurally necessary for the latter to gain such *perceived* autonomy and to be exchanged against a monetary equivalent. The perceived autonomy of commodities may be qualified of *necessarily infrastructural,* in the sense that it is instrumental to the

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[372] Marx, *Capital*, vol. I, 289.
[373] Marx, *Capital*, vol. I, 953.
[374] Marx, *Capital*, vol. I, 165.

logic of exchange and results from a product's dislocation from one infrastructural milieu (production) to another (exchange).

Conventions of composition that exclude the photographer from representation in the photograph that they produced, may be interpreted as expressing demands pressed upon representation by the logics of commodity exchange. The photographic document, as produced by a corporation, though it may not be intended to constitute a product beyond the corporation's bounds, may be haunted by the possibility of circulation and commodification, and hence by the mystifying ontology of the commodity whereby relationships between products of labour may appear as relationships between mere objects. In the context of photography as industrial practice, the activity of the photographer does indeed constitute a form of alienated labour, i.e., purchased by a corporation as commodity. And the labour of the photographer does present a degree of *invisibility* in the product (the photographic document).[375] In the reports or "fiches d'analyse" (accident analysis files) studied here, the identities of the photographers are not revealed. However, forensic photographs do bear ostensible marks pointing to the presence of an image-maker – such as shadows resulting from the use of flash; and indeed, in the case of underground mining, no photographs may be captured without the introduction of artificial light by the photographer at work. Each of the photographs produced on the mining site points to the presence of the working photographer, the position of the camera, and of the light source introduced by them and necessary for a document's production (see Figure 63, page 159).

Furthermore, the series of migrations and transactions that have led to a photographic document's domiciliation in a new form of institution (from the corporate administrative machine to the public archive) have resulted in an alteration in the use-value of the photograph as document, which seems to have gained a new form of objectivity, whereby the document may be encountered as fragment and the politics of a document's formation may be obscured. A genealogy of the *production* of documents would therefore account for the effects of the *infrastructural migrations* of documents from institution to institution and for material relations between institutions (the public archive studied is a repurposed industrial warehouse, and its contents would never exist without the history of coal extraction). Allan Sekula pointed out that "the general condition of archives involves the subordination of use to the logic of exchange. Thus, not only are the pictures in archives often *literally* for sale, but their meanings are up for grabs […] New owners are invited, new interpretations promised."[376] Sekula refers to this "semantic availability" of photographs as resulting from a "loss of context," whereby an image's original use may become obscured due to processes involved in

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[375] To undertake ethnographic studies HBL hired photographers via external agencies. Photographers' names would be acknowledged by the corporation (e.g., J.L. Craven referred to in Chapter 1).
[376] Sekula, "Photography between Labour and Capital," 194.

archival re-consignation and re-classification, or to their dissemination in new contexts of circulation (via sale or reproduction):

> In an archive, the possibility of meaning is "liberated" from the actual contingencies of use. But this liberation is also a loss, an *abstraction* from the complexity and richness of use, a loss of context. Thus *the specificity of "original" uses and meanings can be avoided, and even made invisible*, when photographs are selected from an archive and reproduced in a book. [...] So new meanings come to supplant old ones, with the archive serving as a kind of "clearing house" of meaning. (My emphasis)[377]

From the standpoint of an infrastructuralist analysis, the series of possible decontextualisations that a photograph may undergo, from the context of its production to its consignment in an archive, to its dissemination via reproduction or sale, may be problematised as a series of infrastructural displacements or dislocations, resulting in the fact that a photograph may also be encountered as a free-floating fragment, while its infrastructural genealogy may be obscured.

CAITM's photographic collections contain numerous albums whose content still needs to be identified and ascertained. While the technical content, date and location, and general context of some images may have been identified, such defining information may not be known or available for a great number of them. A particular dossier contains numerous pages of photographs which display an ordered juxtaposition of images (reminiscent of contact sheets). However, while the archivist whose task it will have been to give as precise a form of context to these as possible based on their knowledge of the subject, there was no existing accompanying information to these albums when acquired by CAITM.[378] The loss of context caused by the transfer of documents from one location to the next, endows these contact sheets with the aura of an uncanny collage (see images 56 and 57), while the descriptive captions featured in the inventory, which tentatively give some context, are somehow generic or tautologic:

> Système d'appel généralisé.
> Sonnerie d'appel pour les sauveteurs.
> Ramassage en camionnette des sauveteurs pour aller au travail.
> Groupe posant devant un bâtiment.
> Botte en mauvais état.[379]

The photograph of a torn boot visibly documents the damage caused by an accident but there is no information concerning the latter's precise circumstances. Sekula hinted at the obscuring of the undercurrents of power relations subtending the social reality imaged in photographs as an effect of "the relation of *abstract visual equivalence*" established by archives between pictures.[380] While Sekula

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[377] Sekula, "Photography between Labour and Capital," 194.
[378] Information based on a conversation with Sébastien Mellard, former director of CAITM, August 2016.
[379] Generalized communication system. Call bell for rescuers. Pickup of rescuers by van to go to work. Group posing in front of a building. Boot in poor condition. (My translation)
[380] Sekula, "Photography between Labour and Capital," 195.

emphasised the "semantic availability" of photographs as they enter, or circulate out of, an archive, and are subjected to a series of decontextualisations, one may consider the semantic loss resulting from such decontextualisations, taking into account the material processes and relations that these imply. That is from the perspective of the infrastructural modularity of the photograph (its capacity of becoming a free-floating fragment and of being inserted in new iterative formations), of photographs' logistical migrations in the material economies of the corporate and public archives, and that of the dislocation of documents linked with de-industrialisation.
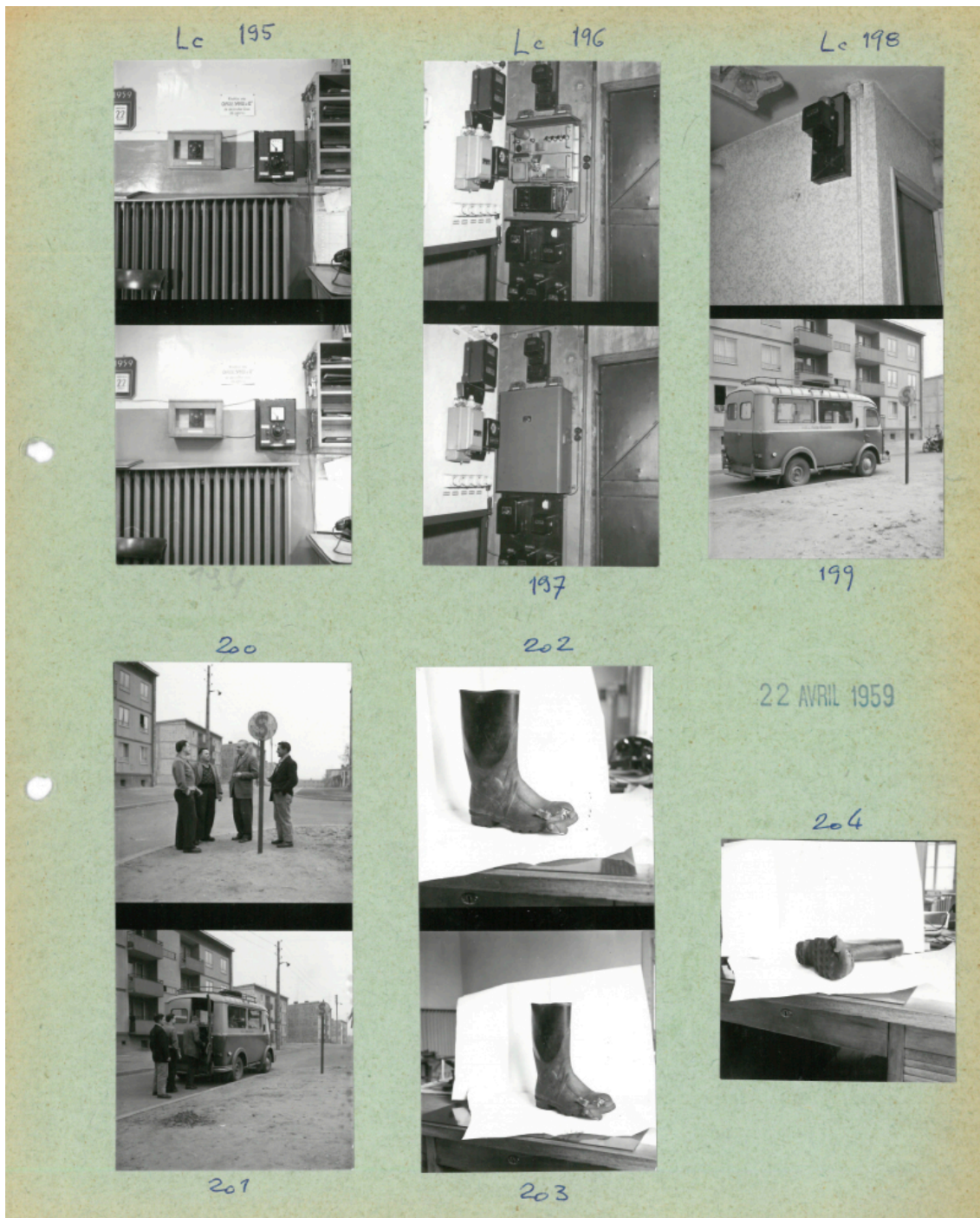
Figures 64. Photographer unknown, "Untitled [telecom board, transport of workers, damaged boot]," c. 1959-1961.Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.
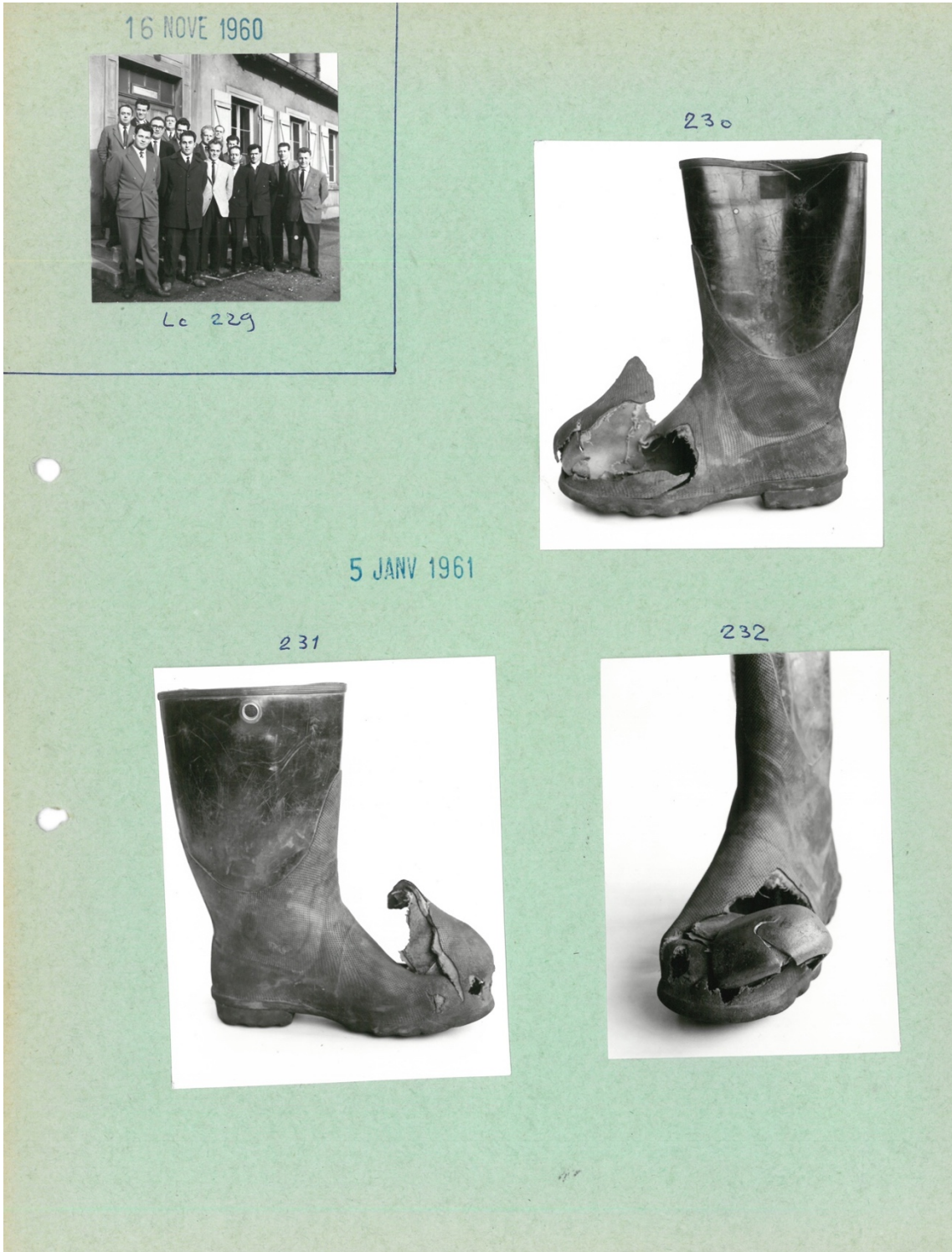
Figures 65. Photographer unknown, "Untitled [group of unidentified workers, damaged boot]," c. 1959-1961. Photographs originally © HBL. Public domain. Reproduced courtesy of CAITM.

3.b. Infrastructural(ist) interventions: information, affect, reproducibility

An art practice may be understood to intervene at the level of the infrastructural determination of photographs. The modularity of photographs, as discussed, and their reproducibility may endow photographs of work accidents with a novel form of infrastructural operability. This includes the dissemination of archival materials via critical practices of analysis and artistic interventions which may be qualified of infrastructural(ist), whereby the photographic document may be integrated in new formations that comprise discursive and non-discursive forms. An art practice may be understood as engaging directly with the material and infrastructural economy of the post-industrial archive by inserting photographic documents in novel iterative contexts or formations and by considering the infrastructural agency of documents and of archival technologies and architectures.[381] Giving a formal and material expression to correlations existing in the political anatomy of extraction and its archive that may have been obscured, may take shape in a heterogeneity of formats, from compositing to installation.

In resorting to various processes for the transfer of photographic documents from their original, archival form to various formats of reproduction (e.g., transfers from the print form to digital formats via scanning to C-type or inkjet printing, transfers to silk screens, or zinc plates, and hence to different types of surfaces, from silk to paper or metal, wood, or cloth, via different types of inks, from inkjet to oil-based and acrylic paints), one engages with the infrastructural, logistical dimension of the photograph. Through various forms of transfers, one observes the persistence or loss of information, and the logistical property of photographs is not only made visible, but operative, albeit in a different register than that of their original usage, a register situated at the intersection of documentation and affect. Such infrastructural(ist) interventions rely on the repetition of actions pertaining to learnt, normalised processes while undertaking a performative anatomy of the infrastructural dimension of photographs that probes a tension between the transmission of (historical) information and the emergence of affective dynamics, which this research sees as connected to the historicity of documents (see Chapter 2).

Furthermore, photographic reproducibility allows for the production of configurations of documents that differ from those derived from the classificatory logics of the corporate and public archives. This enables a re-envisioning of relations existing between documents. This may consist in

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[381] For an example of performative approaches to an infrastructuralist interpretation of the architecture of libraries as "memory machines," see: Bhowmik and Parikka, "Memory Machines," 377–381.

juxtaposing copies of documents relating to the same event but located in different types of dossiers due to archival re-domiciliation (that linked to deindustrialisation).[382] Juxtaposition, enabled by the copy, compositing and printing, is preceded by various stages of infrastructural transfers (described above) whereby the original document gains a different quality, agency, and existence. Juxtaposition leads to re-configuring not only the *logics* of archival (re)classification but also its material economy. In being gathered on the same plane via compositing,[383] documents gain a different form of agency, while relations between documents that may have become obscured, may be made visible and gain a new form of value. In *The removal of hazard,[384]* I juxtapose various sources relating to the same event, i.e., the 1959 collective accident of Sainte-Fontaine (see Chapter 1) in new configurations through compositing, which constitutes a form of writing by direct quotation (textual and pictorial), where workers' testimonies are brought in juxtaposition with various photographs documenting the setting up of a simulation experiment used for a judicial inquiry, while classificatory titles used in accident analyses or nomenclatures now have a new function (performing a statement).

Infrastructural interventions may also take to form of a still-life. Such image is the result of the process of retrieving archival objects from their allocated location in the archive, transporting them to an in-situ photography studio set up on the archive's site, and juxtaposing archival items together with other items that would normally be spatially separated due to archival consignation. A still-life may also constitute a form of documentation of different use-values: from objects given to the archive "*par voie extra-ordinaire*" (by extra-ordinary paths), i.e., in the forms of gifts made to the archive by individuals (often former miners or their family), to the duplicate destined to be destroyed following specific destruction protocols.[385] The still-life therefore produces a new set of relations between archival items and constitutes a new, but temporary economy of objects, archived by photographic capture. Various labels carried by the objects form a new textual formation through juxtaposition.[386] This process required that access to non-public areas was negotiated and was dependent upon agreement. The still-life, while a re-configuring the archive's spatial organisation, is therefore also the expression of this negotiation.

The transfer of scanned photographs to silk screens[387] leads to a form of lossy preservation of information. The infrastructural properties of photographic images allow one to bring multiple, differing versions of the same image on to the same plane and to study and compare them, so to speak. This allows one to observe the transferability of photographic images from state to state, while

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[382] The yielding of documents by the corporation HBL to the public archive.
[383] Enabled by digital montage or transfer to silk screens.
[384] See Portfolio of works.
[385] See "Catastrophe (Simon 1985)" (2017) in Portfolio of works.
[386] See "Un hôpital ne brûle pas,…"(a hospital does not burn) (2016) in Portfolio of works.
[387] *System in pink and yellow* (2022) in Portfolio of works.

a certain affective dynamic develops and persists. In the process of juxtaposing documents that were separated by corporate procedures or archival consignation, one may become receptive to a power of reverberation across the multiplicity and heterogeneity of documented accidents. A photograph may echo another in a kind of wider resonance. The historical and material connectedness of accidents takes a formal expression enabled by the logistical property of photographs. An infrastructural(ist) intervention aims to undertake a pedagogy that consists in highlighting the relational ontology of documents, as partaking in the political economy of extraction, while considering affect from the perspective of a relational dynamic between the historicity of accidents and subjects.

Colours, introduced through the medium of paint via silk screens, while carrying photographic information, are used referentially to recall the corporation's administrative distinction between fatal and non-fatal serious accidents (on yellow and pink sheets of paper respectively). Formulas of colour combinations are produced to replicate these from memory and are recorded and re-applied at various stages. Screen printing allows one to juxtapose approximate replicas of these colors and apply them across all documents. I then apply the same process to my own photographs (architectural studies of the archives of CAITM and BRGM; still lives; composites; ...). The transfer to silk screens allows me to unify archival documents and my own work formally and to express their correlated genealogies.

Through these processes, documents' plural versions and new configurations of documents come to exist outside the public archive, e.g., in the context of exhibitions in the private gallery or the public museum, that of seminars or crit sessions in the art school, or through the artist book. Each of these contexts may in turn become the subject of an infrastructuralist analysis, as a version of institutional critique. Such analysis would emphasize the ecology of materials, technical apparatuses, social relations, and forms of labour constituting the environment of each institution.[388] Artistic strategies may not only draw an audience's attention to the infrastructural determination of photographic documents but also inscribe such audience in the relational economy constituted through photography[389] in a particular institutional environment.

Furthermore, one may consider the notion of institution in a broader sense, through that of *processes of institutionalisation* as constitutive of the social fabric and as conditioning how subjects are governed (understood in a wide sense). Robert Vallier underlines the connectedness of the concept of institution to the methodology of genealogy in Michel Foucault's work:

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[388] Bhowmik and Parikka, "Memory Machines," 379.
[389] As noted in Chapter 2, Ariella Azoulay emphasised the relational, political ontology of photography.

> […] genealogy unravels the complex processes of "institutionalization" – that is, the diverse strategies and "a profusion of entangled events"[390] that overlap, cohere, intersect, and interfere with one another, eventually crystallizing in an institution - and thus also reveals how the social body is comprised of interrelated institutions that structure the field of possibilities and govern what we are.[391]

Institutionalisation refers here to the "concretion or crystallisation of power relations."[392] Photography may be understood as a medium of institutionalisation (and normalisation) for the corporation. However, this research has situated photographic documentation of work accident as occurring in a tension between the disruption introduced by accidents in the regime of extraction and processes of institutionalisation-normalisation. One may say that the (political) value of photographic documents of work accidents lies in that they occur as a result of deviations in the crystallisation of corporate power caused by work accidents, while at the same time bearing testimony to the sheer objectification of subjects (workers) in the name of capitalist profiteering. In the void left by the death of a worker, the corporation employs representational means, as a tactic. By virtue of its material determination, the photographic document may be disseminated in new iterative contexts or formations, thus allowing for plural interpretations, and evaluations of its informational content. Jacques Derrida drew attention to the structure of dissemination of signs as a structure of spacing[393] allowing for signs and statements to exist in novel contexts of dissemination or iteration beyond the temporality of their first utterance or emergence, and beyond the existence of their first producers. This structure of dissemination ushers the futurity of signs and radically new interpretations and usages. From an infrastructuralist perspective, dissemination allows for the possibility of new material economies of signs, objects, and subjects. That it is *logistically* possible to transfer the documents once produced by a corporation into the context of an art practice (or other contexts of dissemination) enacts a certain power to act made tangible by the infrastructural dimension of photography, one's rights of access to the corporate archive become public, and by the dissolution of such corporation.

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[390] Michel Foucault, *The Essential Foucault*, 361.
[391] Robert Vallier, "Institution," in *CFL*, 220.
[392] Vallier, "Institution," 217.
[393] Jacques Derrida, "Différance," in *Margins of Philosophy,* trans. Alan Bass (Chicago: University of Chicago Press, 1982), 3-27.

4. Diagrammatics of Extraction, the Work Accident, and the Photograph

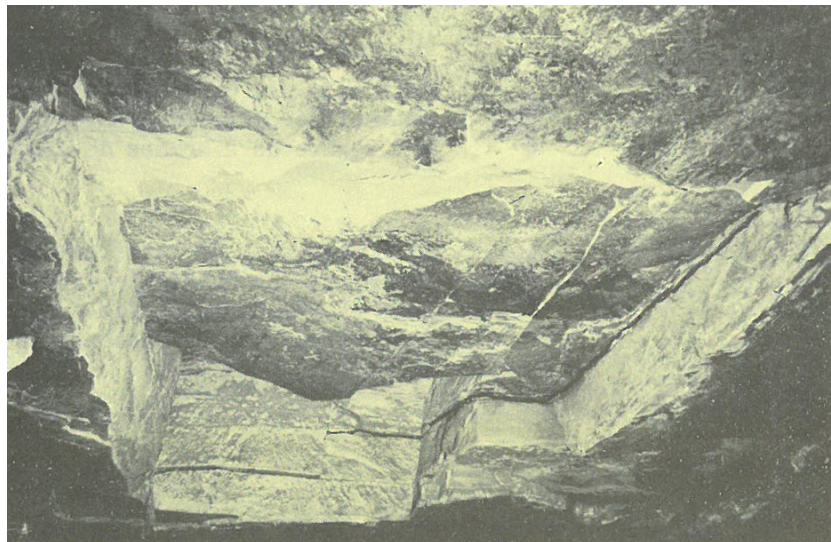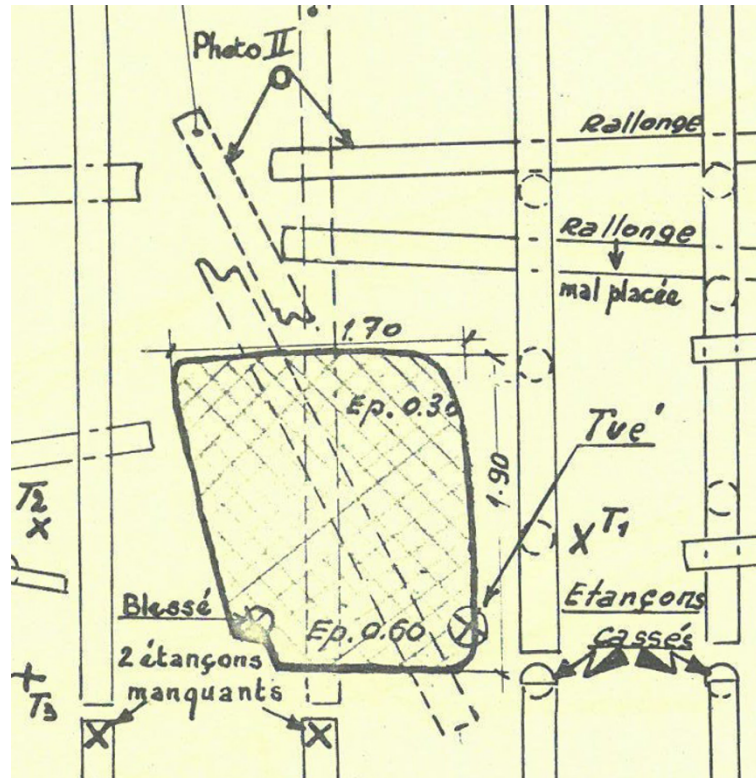## 4.a. The photograph, the forensic diagram, and the ecological diagram

Figure 66 (top). Artist unknown, "Untitled [Diagram 2, fatal accident 13/63]," (detail), c. 1963.
Figure 67 (bottom). Photographer unknown, "Untitled [Photograph 2 of fatal accident 13/63]," c. 1963.
Diagram and photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

The photograph presents itself as a fragment and presents the field of extraction as an image while a diagrammatic representation (such as a schema, a sketch, or a map) may better represent the photograph's embeddedness in the industrial environment of the mine, in the depth of the earth, and as infrastructural to a wider system. Diagrams 1, 2 and 3 of the accident file 13/63[394] offer three different representations of the accident's topography: a longitudinal view of the wider topography of the accident within the field of extraction; what would correspond to a bird's eye view of a closer parameter indicating the positions of the victims, and the successive positions of the photographic camera resulting in three separate photographs; and finally, a lateral sketch of the direct topography of the accident. While the corporation produces its own diagrammatic representations of the accident's immediate and wider topographical contexts, such representations are centred on the instrumental functionality of the machinery, of workers, and that of the mine's architecture. Such diagrams therefore put emphasis on topography, spatial location, and material infrastructures of extraction, in a partial manner. They do not qualify such elements conceptually within the *politics* of extraction and while they attempt to conflate spatial and temporal representations (diagrams often visually represent infrastructures before and after the incident on the same visual or spatial plane) they reduce the accident's temporal chronology to a "before" and "after" scenario. The forensic diagram is therefore imbued with instrumental logics befitting industrial extractivism and is conceptually reductive. It does not offer a critical or political anatomy of the extractive field nor of the injured body.

Mining diagrams, sketches, and maps may be interpreted as expressing the abstracted viewpoint of the engineer, of the surveyor, or of the proprietor, and as charting a hierarchy of knowledge established on a division between manual and intellectual forms of labour. In the visual culture of mining, the map is associated with the professional identity of the engineer and is seen to embody their collegiate training.[395] While the use of photographs may be interpreted as placing the viewer in the position of direct observer,[396] an argument premised on the perceived universality of physiological vision, the diagram expresses the ability to see geometrically and mathematically, which in turn expresses the power-knowledge to do so and which is vested upon the surveyor or engineer by the corporation.

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[394] Respectively Figure 61 on page 144 and Figures 68 and 69 on page 172.
[395] Eric C. Nystrom, *Seeing Underground: Maps, Models, and Mining Engineering in America* (Reno & Las Vegas: University of Nevada Press, 2014), 50-51.
[396] Sekula, "Photography between Labour and Capital," 205.
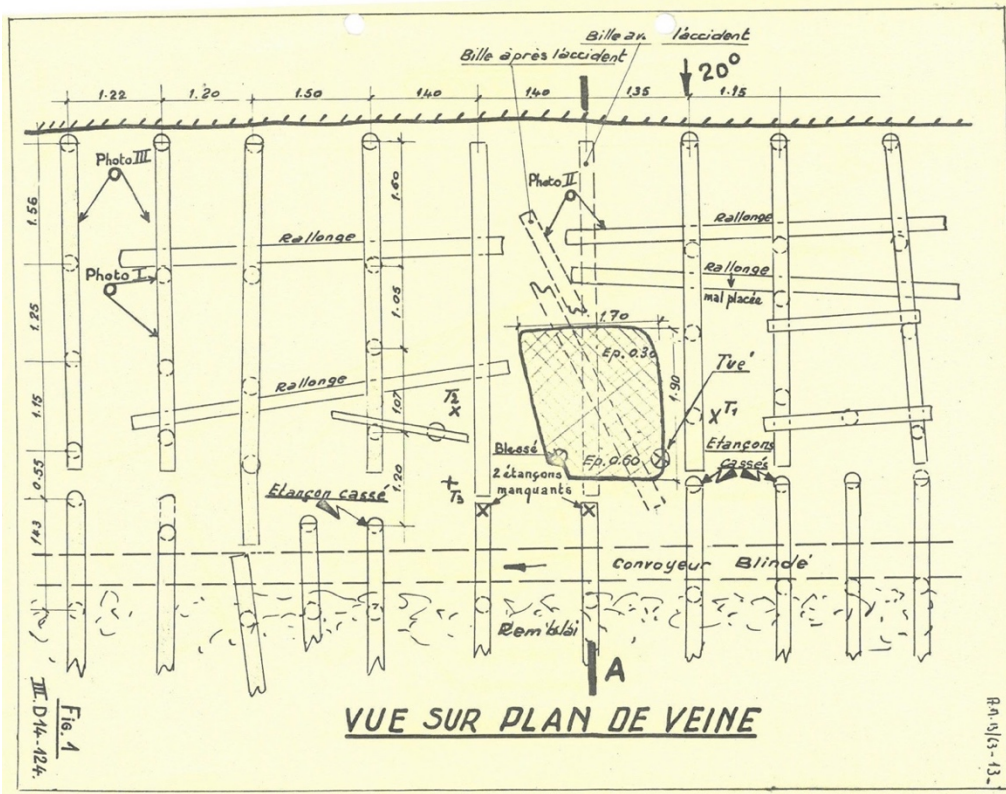
Figures 68. Artist unknown, "Vue sur Plan de Veine [top view of coal vein, fatal accident 13/63]," c. 1963.
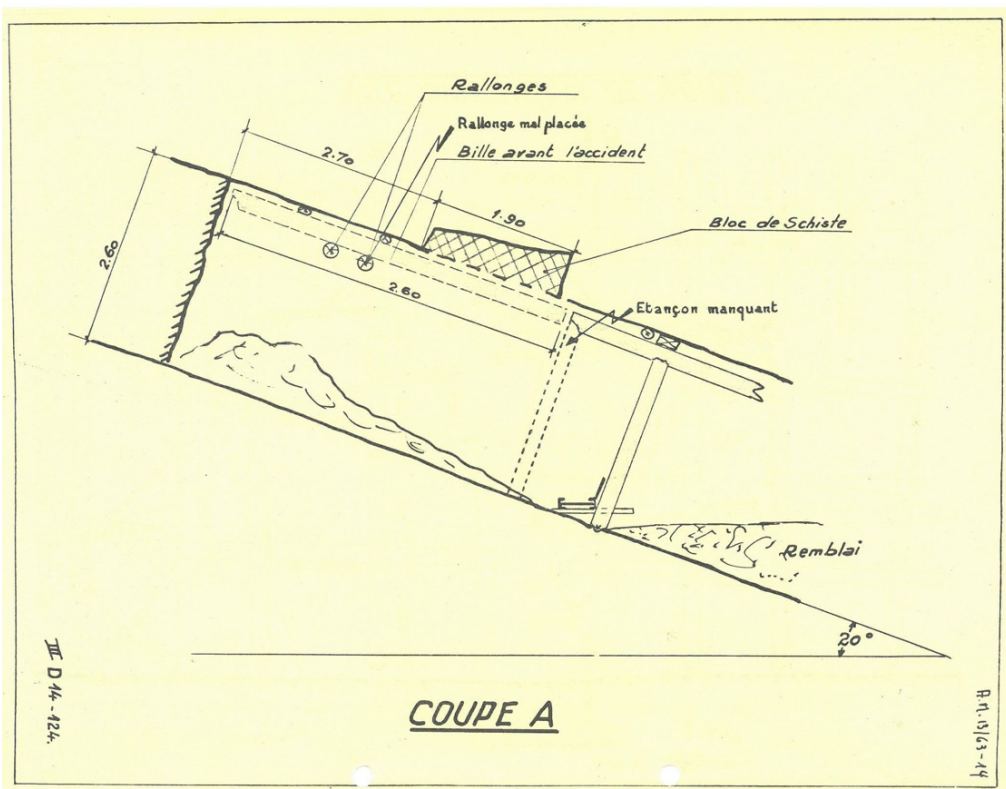
Figures 69. Artist unknown, "Coupe A [side view A, fatal accident 13/33]," c. 1963.
Diagrams originally © HBL. Public domain. Reproduced courtesy of CAITM.

A—KINDLED LOGS. B—STICKS SHAVED DOWN FAN-SHAPED. C—TUNNEL.

Figure 70. Agricola, Georgius. "Untitled [woodcut in *De Re Metallica*, Book VI]," 1556. Public domain.

While the photograph is imaged in the field of extraction from the potential position of a worker, the diagram may be understood to correspond to a virtual or abstract position,[397] and to express the line of sight of a position of power. An early example of a record of *subterranean geometry* in mining is to be found in Georgius Agricola's *De Re Metallica* (1556)[398] which, while it took Andrea Vesalius' anatomy *De Humani Corporis Fabrica* (1543)[399] as a methodological model, principally maps technical knowledge reflecting the interests and territorial ambitions of proprietors in proto-capitalist society.[400] The politics of the labour relations and the hierarchisation of the workforce subtending the extractivist world pictured by *De Re Metallica*, while sometimes visible through elements portraying the sociable dimension of labour,[401] appear to serve the purpose of dramatization (see Figure 70). *De Re Metallica* presented a *practical geometry* addressed to mine owners, mostly nobles and a new class of capitalist prospectors, to which Agricola belonged.[402] One of the values of *De Re Metallica* lies

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[397] Sekula, "Photography between Labour and Capital," 208.

[398] Georgius Agricola, *De Re Metallica*, trans. Herbert Clark Hoover and Lou Henry Hoover (New York: Dover Publications, 1950), 66.

[399] Vesalius, Andreas. *De Humani Corporis Fabrica* (On the Fabric of the Human Body) (1543), Public domain. https://www.bl.uk/collection-items/vesalius-anatomy.

[400] Sekula, "Photography between Labour and Capital," 205.

[401] Sekula, "Photography between Labour and Capital," 211.

[402] Sekula, "Photography between Labour and Capital," 207.

in its seminal dimension as the first recorded attempt at representing an industry in a totalising fashion by pictorial means and in constituting "the repository of a new centralized knowledge."[403] The value of *De Re Metallica* for this research lies in contrasting or indeed juxtaposing its visual strategies to that of forensic corporate diagrams.[404] Furthermore, as pointed out by Anne-Françoise Garçon, Agricola undertook to think of the mine as of a body and to adopt descriptive methodologies proper to anatomy:

> Penser la mine comme un corps, fut cela aussi: user des manières de penser la description propre à l'anatomie, parfois même en importer les termes. [405] [De re metallica] was also about thinking of the mine as a body: to use ways of thinking about description that were proper to anatomy, sometimes even to import its terms. (My translation)

The fact that Agricola set out to undertake an anatomy of the subterranean world of mining which remained infused with the instrumental logics of extraction and the territorial claims made by proprietors is of interest as it offers a contrasting perspective to what a political anatomy of extraction may offer.

To trace infrastructuralist diagrams of photographic documents is to produce a schema of their indexicality as infrastructurally determined and to trace the photograph's inscription in the political anatomy of extraction. The photograph and the forensic diagram may be understood as expressing two different forms or levels of abstraction at work in the regime of extraction,[406] as two forms of schematizations, that is, two forms of *abstracting* or *extruding* dimensions out of the milieu recorded, resulting in a representation. These dimensions may be sensorial, infrastructural, political, etc. One may say that the photograph constitutes a schematic representation of the infrastructural milieu it is produced in. The flatness or platitude of the photograph, referred to in a previous section, and the abstract dimension of the forensic diagram may both be interpreted as constituting a form of schematic reduction. It may be argued that this process of reduction speaks of a form of urgency, which may be linked back to the strategic urgency to which a dispositival ensemble responds via its tactics (see Chapter 3). Hence the forensic photograph and the diagram, not only express the lines of sight of supervisory power and ownership, but also lines of force[407] whereby the geometrification of looking serves, or is instrumental to, the territorial ambitions of the corporation. Where the photograph and the diagram, schema, or map, are enablers of territorialisation and control.

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[403] Sekula, "Photography between Labour and Capital," 212.

[404] As sourced in the CAITM.

[405] Anne-Françoise Garçon, "Réduire la mine en science? Anatomie des De re metallica d'Agricola," Séminaire "Formation des savoirs à l'époque moderne" Centre Alexandre Koyré - Paris, January 2005, France, 6

[406] Kevin Coleman and Daniel James link the processes of abstraction at work in the production of photographs to the logics of abstraction operating in capitalism. See Coleman and James, "Introduction: Capitalism and the Camera," 1-26.

[407] Paul Virilio discusses "the geometrification of looking" with regards to "the act of taking aim" in a military context and which he refers to as a "line of force." See Virilio, *War and Cinema*, 3.
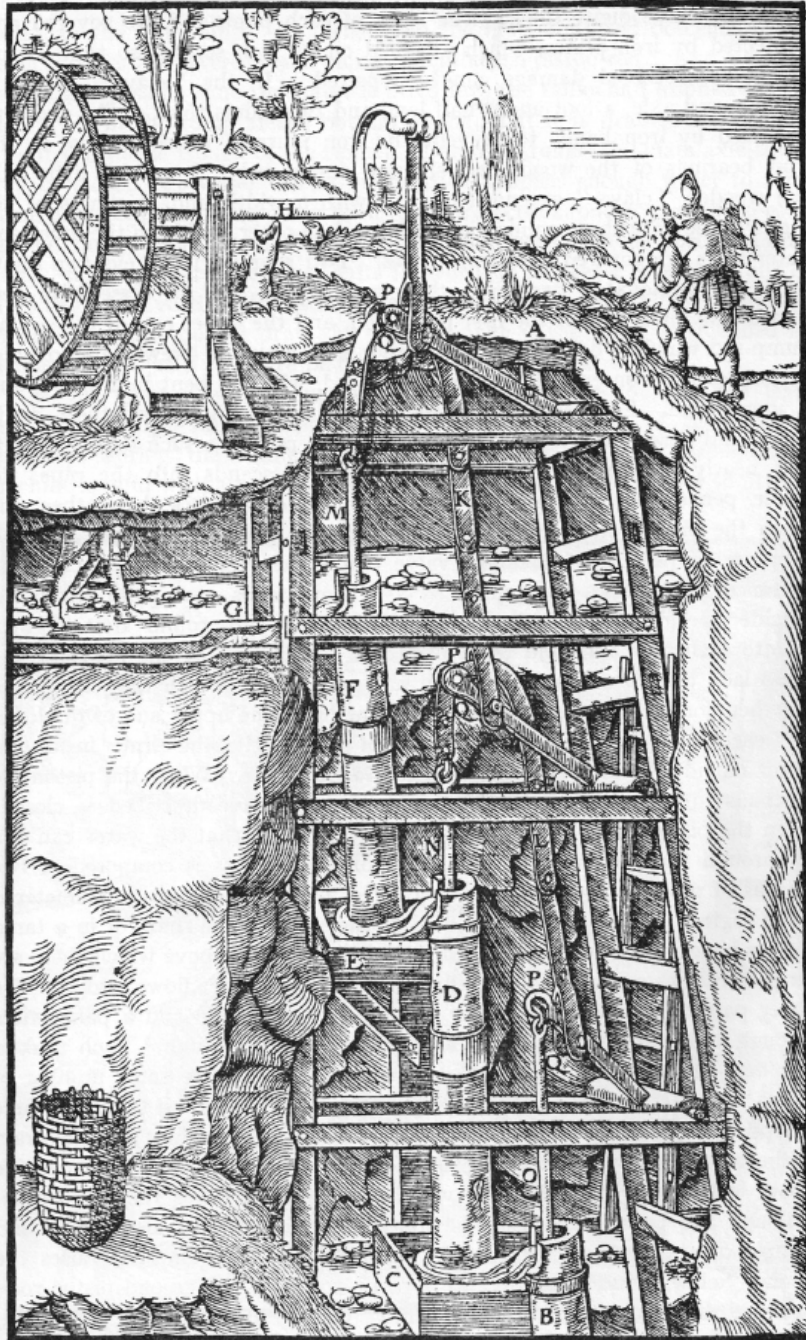
Figure 71. Agricola, Georgius. "Untitled [woodcut in *De Re Metallica*, Book VI]," 1556. Public domain.

One may add that while the photograph feigns to mimic the visual experience of the worker, logistically it constitutes the power to image a situation of danger and risk and enables the recording, transfer, and storing of information for the production of future knowledge by the corporation. The forensic photograph must be produced in the direct aftermath of an accident to record its marks in the most immediate chronology possible. One may say that the act of recording the accident scene by photographic means corresponds to a form of accelerated process informing the production of corporate forensic diagrams which were traced manually (in the examples considered). The forensic diagram is thus the fruit of a different kind of labour necessitating the analysis of different kinds of documents (including but not limited to photographs). The photograph may be understood as constituting one of their infrastructural substrates: the photograph *informs* the forensic diagram.

Three-dimensional models of the topography of mines intervene in different contexts of strategic intervention. While sometimes used for pedagogical purposes (study models) or public engagement (display models in exhibitions), models are mostly used for the purposes of forensics and lawsuits.[408] As discussed in Chapter 1, three dimensional models used during simulation experiments expressed a rational schema based on the principle of relations of similitude whereby simulated events (experiments) constituted a basis for re-enacting the causal chain of events of historical accidents. The three-dimensional model constitutes an aetiological tool befitting the biopolitics of a form of power striving to contain the disruptive effects of aleatory events and the elaboration of statistical instruments design to forecast future possible risk.

Seeing diagrammatically may lead to thinking geometrically and systematically but not necessarily politically (in terms of relations of power). The forensic diagrams produced by the corporation translate an *instrumental* ecology infused by utilitarian logics. A political, ecological diagram of extraction[409] would produce an anatomy or analysis of the material relations enacting relations of power. Such a diagram may emphasize the photograph's embeddedness in a corporation's extractivist system, as well as the politics in which the work accident is inscribed by producing an ecological analysis of photography in the regime of extraction which traces the structural or diagrammatical correlations between photography, extractive events (of which accidents are one type), and the wider system of industrial infrastructures.

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[408] For a taxonomy of technical models used in mines, see: Nystrom, *Seeing Underground*, 116-117.
[409] For a discussion of the need for an ecological analysis of work accidents see: Arthur F. McEvoy, "Working Environments: An Ecological Approach to Industrial Health and Safety," *Technology and Culture* 36, no. 2 (1995): 145–73.
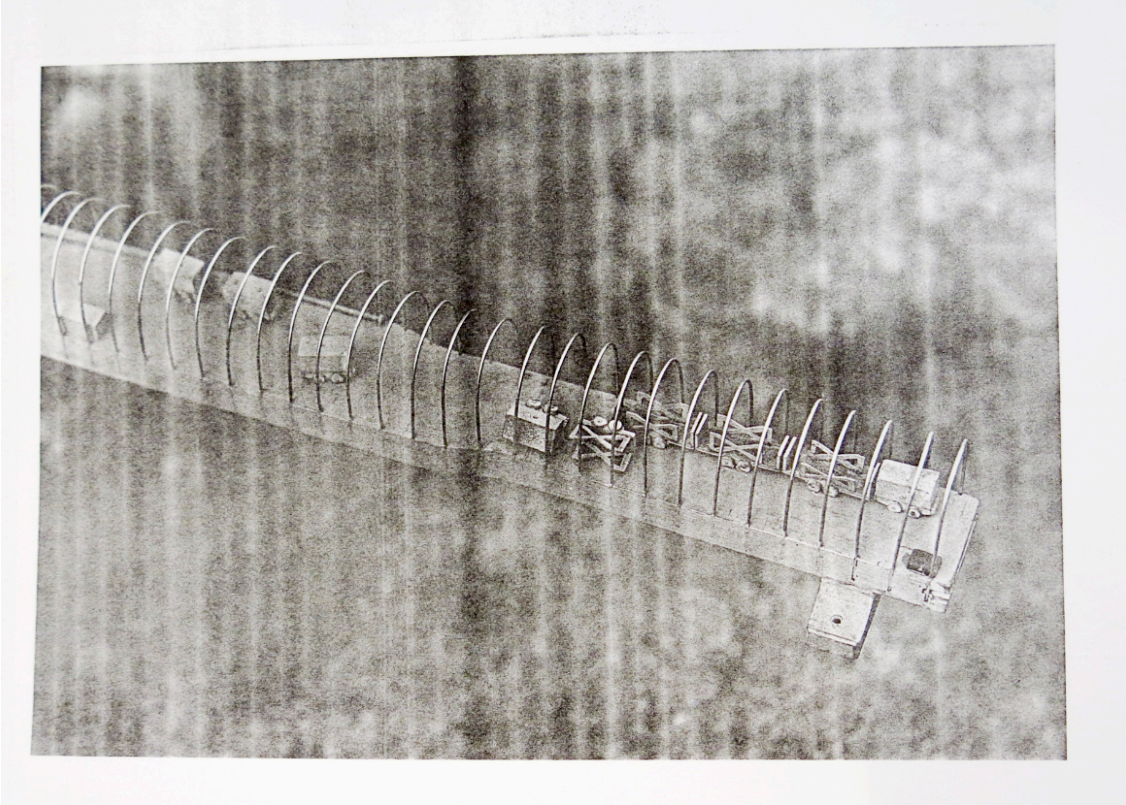
Figure 72. Photographer unknown, "Untitled [model of the subterranean topography of a coal mine]," n.d. Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.

[REDACTED]

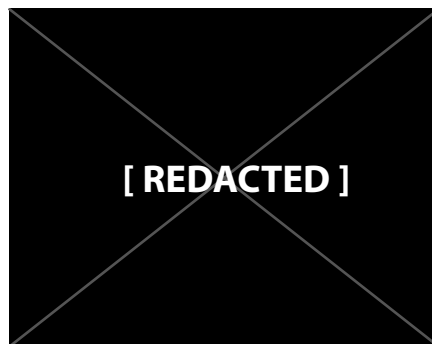Figure 73. Photographer unknown, "[Three-dimension model of a coal mining site, Cripple Creek lawsuit]," c. 1908.

Figure 74. Photographer unknown, "Untitled," c. 1963.
Photograph originally © HBL. Public domain. Reproduced courtesy of CAITM.
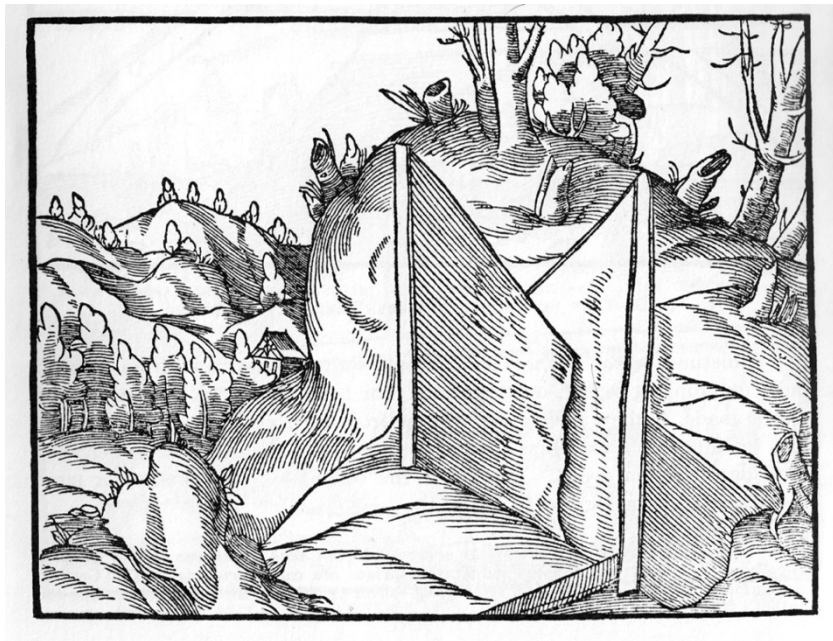
Figure 75. Agricola, Georgius. "Untitled [woodcut in *De Re Metallica*, Book III]," 1556. Public domain.

As one juxtaposes differing visual registers, one starts to see the geometry of abstract planes in the photograph of the aftermath, which may or may not correspond to the geometry of exploitation, as set out the proprietor and translated by the engineer. François Arago referred to photography as a medium "in which objects preserve mathematically their form."[410] What is the value of such medium when the form of objects (and subjects), or of the reality documented is destroyed or damaged in the event of the work accident? The photograph becomes a document of the disruption of the geometry of extraction. And the geometry of the work accident which may be characterised as an entanglement of injured or mutilated bodies, defunct infrastructures, and a damaged environment, is mathematically transposed in the realm of the photographic image, its archive. The photographs of work accidents form a visual rhetoric of arrested extraction, or anti-production, and of damaged life. While the prospective diagram projects the ambitions of a future exploitation of the natural environment and embodies a geometry expressing capitalist, extractivist interests, the photograph of a work accident's aftermath records a different kind of geometry – a geometry of destruction or of a conflict between two regimes of forces, natural (geological, biological) and industrial (capitalocentric).

4.b. Tracing the physics of the gaze in the optics of surfaces: photographic multiplicity, diffraction, power

One may say that there is a physics of the gaze that is conditioned or determined by the photographic surface as infrastructure whereby the optical event of the gaze (in the encounter with a given photograph) is spatially defined by the boundaries of the limited territory or interface constituted by the photographic surface. Consequently, one's gaze is displaced or guided towards singular surfaces or a multiplicity of surfaces, while the deeper anatomy of the photographic apparatus, material and virtual,[411] of which they are parts remains out of sight, as it is not transposed in the realm of the imaged. One may indeed trace the diagrams of the optics of surfaces and its effects. Such diagrams may give a form or expression to the relations that bind surfaces to one

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[410] Arago. "Letter to Duchâtel (June, 1839)." in Gernsheim, Helmut and Alison Gernsheim. *L. J. M. Daguerre: The History of the Diorama and the Daguerrotype.* New York: Dover Publications, 1968, p. 91. In Sekula, "Photography between Labour and Capital," p. 219

[411] The material instruments, the abstract rationalities (e.g., forms of knowledges), and the relations upon which photography as practice depends.

another, to the instruments and wider apparatus of photography, and to the wider *dispositif* of extraction.

When photography is envisioned from the perspective of an optics of surfaces characterised by multiplicity, it becomes more apparent that in the physics of the act of looking, as one's gaze may be guided towards one object (a photograph), it is displaced away from another. When one's gaze is displaced or guided towards singular surfaces or a multiplicity of surfaces, vision may be diffracted towards a multiplicity of points and planes, in space and time, whereby the relational economy of which such parts are elements becomes obscured or difficult to perceive without laborious activity. Photographic multiplicity, in the corpus of images produced by the archival-industrial complex, at a certain level of experience or infrastructural determination may be perceived as fragmentary, while at another, diagrammatic correlations between singled out surfaces may be given formal expression, and such surfaces may be understood to belong to a system, an ensemble, or a political anatomy.

In Chapter 3, photographic heterogeneity was discussed to refer to the diversity of material forms that characterises photographic technologies,[412] while multiplicity may be understood to refer to the massifying effects of the application of such forms resulting in the *numerous* dimension (or dimension of being numerous) of the corporate archival corpus. While heterogeneity and multiplicity of representational forms and other technologies of power are constitutive of power's capacity for diffusion (at different scales of infrastructural determination),[413] one may say that they mobilise the viewer in such a way that the latter's perception (of the world of extraction) is diffracted or fragmented into a multiplicity or constellation of image-effects that may obliterate or obscure the relational and political economy in which representational forms are inscribed. While an ecological diagram of the field of extraction may produce a global anatomy, the (corporate) archive as heterogeneous multiplicity may lead to the fragmentation of perception and understanding. Hence, photography may be analysed as befitting to the territorial ambitions of a certain form of power – by way of its infrastructural modularity, heterogeneity, capacity for reproducibility, and its ability to operate in qualitatively different regimes of the image (e.g., an image that was produced in a corporate context may be disseminated in social contexts through reproduction in a variety of media).

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[412] Other forms of visual technologies include thermography, holography, videography, or radiography.
[413] See Chapter 3 for a discussion of diffusion and scale.

Post-script:

Diagrammatics of power, logistical images, and the resonance of affect

Photographic heterogeneity may be referred to as a technology of diffusion, while diffusion is problematised as one of the forms of power's positivity or efficacy in a Foucauldian microphysics of power. The concept of *dispositif*, through which the archival-industrial complex of the corporation was interpreted, is linked to a *diagrammatics* of relations of power. As pointed out by Tonkonoff, Gilles Deleuze highlighted the importance of this dimension of Foucault's analysis of power as "a disseminated network of relations of force"[414] which allowed to explain large ensembles in terms of "infinitesimal relations"[415] and emphasized the centrality of the concept of device (or machinic assemblage in Deleuzian parlance). The notion of diagram[416] was considered by Deleuze as a keystone in Foucault's analytics of power.[417] The diagram (transposed in the concept of abstract machine[418] in Deleuze's work) refers to "the transversal relationship between multiple power/knowledge devices, a relationship productive of vast social formations (disciplinary society, for example)."[419] The term diagram is used only a few times by Foucault in *Discipline and Punish*, once with reference to the camp, and another time with reference to the Panopticon,[420] discussed as "a figure of political technology":

> "[…] the Panopticon must not be understood as a dream building: *it is the diagram of a mechanism of power reduced to its ideal form*; its functioning, abstracted from any obstacle, resistance or friction, must be represented as a pure architectural and optical system: it is in fact *a figure of political technology* that may and must be detached from any specific use."[421] (My emphasis)

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[414] Tonkonoff, *From Tarde to Deleuze,* 92.
[415] Deleuze, Gilles. *Foucault*. Paris: Minuit, 1986, p. 44.
[416] The term *diagram* is used by Foucault with reference to the camp and to the Panopticon in *Discipline and Punish*, 171-172 and 205.
[417] Tonkonoff, *From Tarde to Deleuze,* 92.
[418] Tonkonoff, *From Tarde to Deleuze,* 100.
[419] Tonkonoff, *From Tarde to Deleuze,* 93.
[420] The penitentiary designed by Jeremy Bentham (1748–1832) constituted a "proposed prison, an 'Inspection House' envisaged as a circular building, with the prisoners' cells arranged around the outer wall and the central point dominated by an inspection tower." UCL Bentham Project, *UCL,* 2022. https://www.ucl.ac.uk/bentham-project/who-was-jeremy-bentham/panopticon.
[421] Foucault, *DP*, 205.

In this research a Foucauldian diagrammatics of power allows me to think the invisibility of certain structural relationships in the political anatomy of extraction (i.e., between photography and instruments of extraction; photography and the coerced worker; etc.) in terms of relations of power forming *figures*. Hence relations within the archival-industrial complex may be thought through the notion of "figure[s] of political technology" and diagrammatics of visibility *and* invisibility enmeshed with that of extraction. As discussed in Chapter 4, the photograph reveals and conceals at the same time. In coal mines workers were exposed to extreme risks in conditions of almost constant darkness,[422] while the photographic event (e.g., forensic documentation or ethnographic studies) introduced the artifice of light in a limited timeframe, thus never representing the miners' experience of darkness and limited sight. The public archive which now houses the former corporate archive (if only partially) may be understood as expressing a new diagrammatics that is *genealogically* related to that of the corporate archival-industrial complex. One stems historically and materially from the other. While in Foucault's work the term diagram is used with regards to the production of a grid of visibility,[423] this research problematises such visibility embodied in the corpus of industrial photographs *beyond visuality* by emphasizing the infrastructural and material dimensions of photographs as enmeshed in the *dispositif* of extraction. Photographs are understood as logistical objects and *operational documents.*[424]

My artistic practice aims to engage with the diagrammatic relationships that exist between archival documents, and between documents and subjects, as well as with the infrastructural and material economy of the corporate archive. Such practice constitutes an intervention in the material, infrastructural genealogy of the archive made public, intrinsically linked to the genealogy of the archival-industrial complex of the corporation, both forming an extractivist infrastructural ensemble. Reproducibility (mechanical or digital) was problematised as an infrastructural modality of the photograph, allowing for new configurations that may give formal expression to invisible relations between documents, entities, and subjects. The copy, while a medium for re-configuring archival logics and for revealing obscured diagrammatic relations, may allow for a form of technological, performative re-enactment of the infrastructural properties of the photograph – then a technology

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[422] In an era of pre-digital and pre-algorithmic or pre-autonomous technologies.

[423] "The camp is the diagram of a power that acts by means of general visibility. For a long time, this model of the camp or at least its underlying principle was found in urban development, in the construction of working-class housing estates, hospitals, asylums, prisons, schools: the spatial 'nesting' of hierarchized surveillance. The principle was one of 'embedding' ('encastrement'). The camp was to the rather shameful art of surveillance what the dark room was to the great science of optics." Foucault, *DP,* 171-172.

[424] Alan Sekula discusses mining photographs in terms of logistics although not yet using this terminology but by referring to photographs as "operational documents." Sekula, "Photography: Between Labour and Capital," 234. It is Alberto Toscano who offers an interpretation of Sekula's work through the notion of the "logistical image." See Toscano, "The Mirror of Circulation," no pages.

embodying extractivist power, now the enabler of unruly affective dynamics. Juxtaposition (in compositing or installation) probes a tension between the instrumentality of photography as infrastructure and the emergence, or persistence of affect. The reconfiguration of archival consignation by the infrastructural interventions of an art practice leads to a new economy of relations between archival documents, and between documents and subjects.

Affective dynamics pertain to a *relation* that has formed between the reality represented, the subjects alluded or referred to, and the interpreter(s) of documents. To problematise what may be termed, in a first instance, a *historical* relation between a document, the scene documented, an interpreter, and the act of interpretation, one may consider the immediate historicity of such encounter as related to the broader historicity of the accident and that of extraction. The act of interpretation is understood as an affective, critical, material, and infrastructural engagement with the material condition of the photographic document in a manner that considers its *broader material genealogy* (the archival-industrial complex), as well as its *potential genealogy* – i.e., the new material relations and the supplemental values that may form in the process of artistic infrastructural(ist) interventions. Such broader material genealogy of the photograph and its apparatus, understood as *dispositif*, extends to the re-configuration of archival documents resulting from infrastructural interventions.

Beyond the historical specificity of each accident and beyond the material or aesthetic particularities of photographs (due to differences in photographic technologies and their material properties, and variegated levels of precision, or resolution), photographs echo one another, as well as the schematic representations of accidents, in the form of a wider *resonance*. There is a power of reverberation between photographic documents whereby events echo one another, while tropes take shape across documents in the process of developing analytic and artistic strategies. While emphasizing such process may be interpreted as negating the historicity of accidents, I would argue for a link between this power of resonance or reverberation, referred to as affective, and the structural conditioning of accidents. Such link may be qualified of *genealogical.* Affect would be linked to genealogical relations (material, infrastructural) between the political anatomy of extraction and the corporate archive made public, and hence, between accidents, documents, subjects alluded to and interpreters. The notions of a supplemental dynamic of affect-values and that of affective relationality is therefore reframed through the concept of genealogy, derived from a Foucauldian critical historiography.

The supplemental power of the photographic document, i.e., its capacity to exceed the normative effects of the accident report or its ideological or conceptual capture within a forensic semiosis, is intrinsically linked to its material determination. A close consideration of detail, inspired by Barthes'[425] and Foucault's[426] methodologies, led this research to interpret the (photographic) detail in its affective, material, and political determinations. That minute or infinitesimal elements of the photographic image surpass a photographer's intentionality, or an interpreter's investment in the photographic image, may be understood from the perspective of a materialist, infrastructuralist interpretation, and that of a micro-physics of power, as the very *expression* of the photograph's inscription in a material and political anatomy – such as that of the industrial, extractive complex considered by this research. The photograph is therefore also the document of its own material and historical condition. The supplement, "the one 'too many'," to use Barthes' phrase,[427] that one can be affected by beyond intellection, is therefore also a *historical or archival supplement*: the material fact of the photograph, linking the photographic document to the material historicity of its own past *and* to that of its future iterative existence. While one may not see the photograph, but the image it supports, the supplement that exceeds an interpretative semiosis aiming to grasp the 'essence' of the photograph, would be the very material agency of the photograph – its material finitude as its being bound to the material and political anatomy of extraction-production – as a form of technology. The supplement would also be linked to the photograph's ability to be materially bound to other objects in a novel material economy. Therefore, beyond the notion of a supplement that evades meaning, it is the so-called resistance of the photograph to meaning that is problematised in terms of the photograph's material, infrastructural agency, as the latter's capacity to exceed its normative closure or capture, and to exist in a new material context. Such understanding calls for a materialist-infrastructuralist reading of the object 'photograph,' and of the relational ontology of photography (as social practice). The disjunctive agency of the photograph and the emergence of a new value of such photograph in the relationality of affective dynamics may be understood as linked to the photograph's capacity to exist in a new economy of objects and subjects.

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[425] "[…] toute une causalité explique la présence du « détail » […]" Barthes, *La chambre claire*, 72 ("[…] a whole causality explains the presence of the 'detail' […]" Barthes, *Camera Lucida*, 42).
[426] "La discipline est une anatomie politique du détail." Foucault, *Surveiller et punir*, 163 ("Discipline is a political anatomy of detail." Foucault, *DP*, 139).
[427] Barthes, "The Third Meaning," 54.

Appendices

Appendix 1 - A note on the statistical accounting of work accidents in Lorraine

In the years 1961-62 alone, the average number of mining accidents in France was estimated at 47,310 (see Table 1 in Chapter 1). The number of deaths accounted for in coal mining in France across all regional sites between 1861 and 1962 was 22,012. While a total of 37,247 deaths was recorded across all types of mining, quarry work, and prospective work (see Table 2 in Chapter 1). Tables 3 a & 3 b (in Chapter 1) list all major collective mining accidents (leading to the death of 10 or more workers) which occurred in France from 1861 to 1959. Notably, the list falls short of including the collective accident of Sainte-Fontaine of 1959 which led to the death of 26 workers due to a methane explosion (discussed in Chapter 1) but does not appear in the 1965 issue of the *Annales des mines.*[428]

The last large-scale collective mining accident to occur in France was the 1985 "Catastrophe du Puits Simon" (the Simon colliery disaster) in the town of Forbach, in which an explosion took the lives of 22 workers.[429] The last accounted for work-related fatality in the Lorraine coal mines occurred on 21 June 2001 at the site of Merlebach: a 39-year-old miner died due to an underground landslide while eight others were injured. The incident led the **Houillères du Bassin de Lorraine** (HBL) to close this site permanently.[430] The closure, while seemingly marking a radical cultural change in the perception of work-related deaths by the corporation, was to take place by 2007, as a part of the wider process of dissolution of *Charbonnages de France* (CdF)*,* the national coal mining conglomerate that was operative in France from 1946 to 2007.[431]

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[428] *Annales des Mines* (Mining Annals), a state-owned journal published in France since 1794, is among the oldest journals in the world devoted to science, technology, and economics. See Annales des mines [website]: https://www.annales.org/index.html.

[429] Costentin, Blandine. "Coup de grisou au puits Simon: la dernière grande catastrophe minière en France." *France Bleue Lorraine Nord,* 24 February 2015, https://www.nouvelobs.com/societe/20010622.OBS5587/coup-de-charge-dans-une-mine-1-mort.html.

[430] "'Coup de charge' dans une mine: 1 mort." *Nouvel Observateur*, June 21, 2001 [online].

[431] Bezat, Jean-Michel. "Charbonnages de France disparaît après plus de soixante ans d'existence." *Le Monde*, 12 December 2007; see also De Ladoucette, P. "Charbonnages de France et la société française." *Annales des mines* (Mai 2004): 8.

Appendix 2 – Syndicalist Achille Blondeau writes in *Le Monde.*

Extract from: Blondeau, Achille. "Un front commun à la profession. Réponse à l'article de M. Gardent, directeur général des Charbonnages de France intitulé 'Accidents du travail et lutte de classes' (Le Monde du 18 octobre)." Le Monde, 1 November 1975. https://www.lemonde.fr/archives/article/1975/11/01/accidents-du-travail-et-lutte-de-classes_2582745_1819218.html.

M. Achille Blondeau, secrétaire général de la Fédération nationale du sous-sol C.G.T., après avoir affirmé que " les Houillères françaises ont le triste privilège de compter le taux de fréquence d'accidents graves le plus élevé de tous les pays producteurs de charbon de la Communauté européenne ", écrit :

Le fil conducteur du point de vue de M. Gardent est la négation de tout contenu de classe dans les domaines de l'hygiène et de la sécurité. Mais nier la réalité ne la fait pas pour autant disparaître. Dans un régime basé sur le profit, tout est fonction du profit, l'hygiène et la sécurité comme le reste, y compris dans le secteur nationalisé mis au service des grandes sociétés privées.

Curieusement d'ailleurs, M. Gardent le confirme quand il écrit à propos des investissements, dont il conteste le rôle essentiel en matière de sécurité, " ...l'entreprise, comme toute organisation sociale, peut être amenée à des arbitrages entre le souhaitable et le possible. Seuls s'en indigneront les naïfs ou les hypocrites. La vie est fondée sur le risque. La sécurité absolue n'existe dans aucun domaine de l'activité humaine ".

Eh bien !, que l'on nous catalogue donc de naïfs ou d'hypocrites, mais nous nous indignons. Nous récusons le jeu subtil de balancement entre " le souhaitable et le possible ", car trop souvent, la balance penche du mauvais côté.

Nous disons qu'il vaut mieux en faire trop que pas assez quand la vie des travailleurs en dépend. La vie est fondée sur le risque ? Au travail, ce sont les salariés qui le courent, ce risque, et non les P.-D.G., même si l'on qualifie ces derniers de " salariés comme les autres " (!!!).

Depuis la catastrophe du 3 de Lens à Liévin l'on procède, dans les Charbonnages, à l'installation de vingt mille bacs à eau (1). Il n'y en avait que quatre mille l'an dernier L'on accélère la mise en place de têtes de télégrisoumétrie (2). Mais il a fallu Liévin et quarante - deux morts pour que ces mesures soient prises, pour que le souhaitable devienne possible.

En moins d'un an, il y a eu dans le bassin minier du Nord-Pas-de-Calais, la catastrophe de Liévin, l'explosion à la cokerie de Drocourt (trois morts en février 1975), l'explosion du terril de Calonne-Ricouart (cinq morts en août), l'affaire H.G.D., qui est une filiale des Houillères. C'est vraiment beaucoup.

Or il est patent que la préoccupation primordiale des principaux dirigeants politiques et techniques des Houillères du Nord - Pas-de-Calais est de liquider au plus vite le bassin tout en produisant au plus bas prix. Comment ne ferions-nous pas la liaison de cause à effet ? Et la liquidation des Houillères ne procède-t-elle pas d'un choix politique, c'est-à-dire d'une politique de classe ?

[...]

My translation of the article:

"A common front to the profession. Reply to the article by Mr Gardent, Director General of the Charbonnages de France entitled 'Accidents at work and class struggle' (Le Monde of 18 October)."

Mr Achille Blondeau, Secretary-General of the Fédération Nationale du Sous-Sol C.G.T., after stating that "the French Collieries have the sad privilege of having the highest frequency rate of serious accidents of any coal-producing country in the European Community", writes:

The common thread from Mr. Gardent's point of view is the negation of any class content in the areas of health and safety. But denying reality does not make it disappear. In a profit-based regime, everything is a function of profit, health and safety like the rest, including in the nationalized sector put at the service of large private companies.

Curiously, Mr. Gardent confirms this when he writes about investments, whose essential role he disputes in terms of security, "... the company, like any social organization, can be led to trade-offs between the desirable and the possible. Only the naïve or the hypocritical will be indignant. Life is based on risk. Absolute safety does not exist in any field of human activity."

Well! let us be called naïve or hypocritical, but we are indignant. We reject the subtle game of swinging between "the desirable and the possible", because too often the balance tilts on the wrong side.

We say that it is better to do too much than not enough when the lives of workers depend on it. Life is based on risk? At work, it is the employees who run it, this risk, and not the CEOs, even if we call the latter "employees like the others" (!!!).

Since the disaster of the 3 de Lens in Liévin, twenty thousand water tanks have been installed in the Charbonnages (1). There were only four thousand last year The implementation of telegrisoumetry heads is being accelerated (2). But it took Liévin and forty-two deaths for these measures to be taken, for the desirable to become possible.

In less than a year, there has been in the mining basin of Nord-Pas-de-Calais, the Liévin disaster, the explosion at the Drocourt coking plant (three deaths in February 1975), the explosion of the Calonne-Ricouart slag heap (five deaths in August), the H.G.D. affair, which is a subsidiary of the Houillères. That's really a lot. However, it is obvious that the primary concern of the main political and technical leaders of the Houillères du Nord - Pas-de-Calais is to liquidate the basin as quickly as possible while producing at the lowest price.

How would we not make the cause-and-effect connection? And doesn't the liquidation of the Houillères stem from a political choice, that is to say, from a class policy?

Under these conditions, if the engineer, head of the headquarters of 3 de Lens in Liévin, is criminally responsible for the disaster of December 1974, it is in the policy dictated by capitalist profit, in the

very conception that we have of the price to pay for the safety of workers, that we must seek the fundamental responsibilities of insecurity at work.

That the engineers of the Collieries refuse to play the scapegoats, we understand them. But what about their passivity in this matter, and the only collective action they have taken: a strike remotely guided by the management of the Houillères, in the Lens sector, to protest against the way in which the head of headquarters of the 3 de Lens in Liévin was indicted? It was the miners who paid, because they were locked out with loss of wages. The solution is the common front of the profession: workers, supervisors and engineers to fight against the root causes and achieve fundamental changes.

Another big point of disagreement with Mr. Gardent is his conception of the role of each other. According to him, the management must think, the managers and the mastery enforce, and the performers, that is to say the miners... apply. It feels like a regiment. How can we ignore the experience of the staff, especially the "old" miners, managers and supervisors who, after years and years of work, fighting with the forces of nature, know their job at their fingertips, literally feel the mine alive, know its dangers best? I would almost be tempted to thank Mr Gardent for having spoken publicly in this way, because it allows the public to better understand the difficulties we face in our trade union fight for health and safety. Thus, we are faced with a refusal from the Collieries and the government to set up health and safety committees at the level of the wells (3). Following our campaign, we are trying to set up commissions that would include a few workers chosen by the management. We refuse to associate ourselves with this parody, with this organization of an "opposition of Her Majesty". (...)

Finally, the last point I would like to raise: that of responsibility. Mr. Gardent states that "the choice of a scapegoat is no more relevant when it is made "at the top" than when it targeted the too classic lampist". But isn't it the "summit" that holds all the powers, and therefore the responsibilities? And then, we would have liked the "virtuous" indignation that shook some circles during the indictment of the director general of H. G.D., following the Wuillaume case, has spoken on other occasions.

How can we not compare, with the silence of these same circles, when, for example, some time ago, two miners from Courrières were charged and convicted, when five miners and a supervisor were charged at the Rochonvilliers iron mine...

Rather than class justice, we think that it is better, at present, to speak of the will of certain judges, such as Mr de Charette, to achieve fairer justice, which arouses class reactions.

Appendix 3 – Extracts from testimonies relating to the 1959 Sainte Fontaine disaster

[…] j'ai eu l'impression de voir à certains endroits de la galerie D comme du feu en suspension, plus justement des rougeurs, car je n'ai pas vu de flammes.[432]

At certain points in gallery D I thought I could see something like fire in suspension in the air, more precisely red floating patches, for I saw no flames. (My translation of the above)

Je me suis jeté à terre lorsque j'ai vu monter la flamme. J'ai retenu ma respiration pour que mes poumons ne soient pas brûlés.[433]

I threw myself to the ground when I saw the flame grow. I stopped breathing to prevent my lungs from being burnt. (My translation of the above)

À quelques mètres de moi, en allant vers la taille, se trouvaient deux hommes ; il me semble que c'étaient les deux foreurs qui étaient en train de manger. J'ai senti un souffle très chaud dont je ne peux pas préciser le sens car j'ai immédiatement perdu connaissance. Je ne suis redevenu conscient qu'à l'hôpital de Lyon au moment de mon premier bain. Je n'ai aucun souvenir entre ces deux moments. J'ai appris par la suite que l'on m'avait trouvé en face de la taille avec les deux foreurs…[434]

A few meters away from me, in the direction of the coal front, were two men; they were on their break, eating. I felt a very warm gust of air. I cannot tell where it was coming from, nor what its direction was, for I immediately lost consciousness. I only came back to my senses in the hospital in Lyon at the time of my first bath as a patient. I have no recollection between these two moments. I later learnt that I was found near the coal front with the other two men. (My translation of the above)

Un nuage de poussière est venu du bas, nuage de plus en plus chaud ; je me suis accroupi en tournant vers la tête de taille. Presque aussitôt, c'est-à-dire quelques instants après l'apparition des poussières, une flamme a traversé la taille. Cette flamme venait également du bas et il m'a semblé qu'elle se situait du côté foudroyage (cette impression est confirmée par le fait que j'ai été brûlé davantage du côté gauche). J'ai pensé qu'il y avait eu un coup de grisou. J'ai perdu connaissance pendant une durée qui n'a pas dû être très longue et quand j'ai repris connaissance je n'ai plus eu qu'une idée : me sauver. Ma lampe fonctionnait encore mais j'avais des difficultés à voir car mes paupières étaient collées.[435]

A cloud of dust rose from below, a cloud that was getting warmer and hotter; I crouched down as I turned in the direction of the coal face. Almost immediately, that is, a few moments after the appearance of dust, a flame traversed the crosscut. This flame also originated from below and it seemed to me that it was located at the blast front (this impression is confirmed by the fact that I was more prominently burnt on my left side). I thought that there had been a firedamp explosion. I lost consciousness for a period that must not have been very long and when I regained consciousness, my only thought was that I must escape. My lamp was still working but I had trouble seeing as my eyelids were stuck together [due to being burnt]. (My translation of the above)

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[432] Extract from a statement relating to the 1959 Sainte Fontaine disaster made on June 11, 1959, by an 18-year-old miner who survived an explosion which took the lives of 26 workers. *Témoignages* (testimonies), Sainte-Fontaine, June 1959, Dossier 2167CAITM, CAITM, St-Avold, France.

[433] René Sachs survivor of the Sainte Fontaine disaster quoted in "1959: coup de grisou à Sainte-Fontaine." (1959: Methane Explosion at Sainte-Fontaine) *La Semaine*, 17 May 2009.

[434] Testimony of Léon Krier, 27 years old precision mechanic (internal report), n.d., Dossier 2167CAITM2, CAITM, St-Avold, France.

[435] Extract from a declaration made by René Sachs, 20 years old category V worker and cutting drum operator, during a hearing recorded for an internal report by HBL, in relation to the 1959 Sainte-Fontaine disaster, 16 October 1959, Dossier 2167CAITM2, CAITM, St-Avold, France.

Appendix 4 – Simulation experiment quotes

On observe dans un certain nombre de cas que, dans la maquette, la durée de propagation de la flamme est divisée par l'échelle géometrique. Le rapport des temps est égal au rapports des longueurs, les vitesses de flamme étant, en somme, conservés. Il en résulte que la durée de propagation de la flamme dans la maquette est très courte. Pour bien observer le phénomène, il est intéressant de le filmer en utilisant l'éclairage convenable

In a certain number of cases one can observe that in a (simulation) model, the time taken by the flame to propagate itself can be divided by the latter's geometric scale. The ratio of times is equal to the ratios of lengths, the flame's speeds being, in fact, conserved. As a result, the flame propagation time in the model is very short. To properly observe the phenomenon, it is interesting to film it using the appropriate lighting. (My translation of the above)

Un phénomène est régi par une loi qui, si elle est suffisamment connue, se traduit par un système de relations entre les différents facteurs que ce phénomène fait intervenir. […] Pour conserver la loi qui régit le phénomène, il faut modifier les autres facteurs de telle manière que le système d'équations qui traduit la loi reste identique à lui-même. C'est en écrivant cette identité qu'on obtient les relations de similitude qui doivent exister entre les facteurs.

A phenomenon obeys to the principle of a law that, if it is sufficiently well known, can be translated into a system of relations between the different factors that such phenomenon calls forth. […] In order to conserve the law that underlies the phenomenon, one must modify the other factors in such a manner that the system of equations that translates this law remains identical to itself. It is in writing this identity that one obtains the relations of similitude which must exist between factors. (My translation of the above)

All quotes from:

A typed study "Étude sur maquette des explosions de grisou – Application de la méthode en usage en Angleterre pour la reproduction sur maquette du coup de grisou du 29 Mai 1959 au Siège Sainte-Fontaine." (Model-based study of firedamp explosions – Application of the method in use in England for the reproduction on model of the firedamp methane explosion of 29 May 1959 at the Sainte-Fontaine Headquarters) 25 July 1961, by CERCHAR, Dossier 2167CAITM, *Centre des Archives Industrielles et Techniques de Moselle*, Saint-Avold, France.

Appendix 5 – The 1958 Vuillemin disaster, Petite-Rosselle, France

"Jusqu'au front 6, le boisage était normal. Au front 6, le tiers inférieur du front était tiré; l'explosif était éparpillé dans tous les sens. *La caisse à explosif se trouvait dans le blindé.* Le câble de tir conduisait jusque derrière le front 5. L'isolant est brûlé sur les fils des amorces qui avaient fonctionné. La duse d'aérage du front 6 était par terre, toutefois le flexible était arraché à sa jonction. Au front 5 et sur la largeur du front, il manquait le boisage sur 7 à 8 m. Ensuite il restait quelques billes tandis que l'éboulement débutait au front 4. Sont à déplorer comme morts, les ouvriers, (les noms suivront)."

Henri Pfeffer, délégué mineur, catastrophe du puits Vuillemin, 21.11.1958[436]

Until front 6, wood props were normal. At front 6, the lower third of the front was fired; explosives were scattered all over the place. *The explosives crate was in the armored vehicle*. The firing cable was leading as far as behind front 5. The insulation material is burned on the wires of the primers that had worked. The front 6 ventilation funnel was on the ground, but the hose was torn off at its junction. At front 5 and on the width of the front, wooden frames were missing on 7 to 8 m. Then there were a few beam heads left while the landslide started at front 4. Are to be deplored as dead, the workers, (names will follow).
My translation, emphasis in the original)

Henri Pfeffer, minor delegate, Vuillemin well disaster, 21.11.1958

"For hours Friday until late at night the siren howled gloomily over the well Saint-Charles-IV and the Vuillemin well of the coal pits of the town of Petite Roselle. Eleven miners had just died in a terrible accident, and about 20 others, more or less seriously injured or burned, lay on a hospital bed. The tragedy occurred at 15:50 in the G12 vein of the Wendel-Vuillemin well, one of the largest in the Petite Rosselle group, between floors 280 and 364. An explosion, followed by a local landslide, suddenly spread death among the thirty-four workers. 'We suddenly found ourselves in a real furnace,' one of the survivors told a rescuer. 'It was terrible.'" (My translation)

Le Monde, 24 November 1958[437]

"We studied shale samples taken following the Petite Roselle accident of November 21, 1958. Samples were in envelopes numbered from 1 to 14 (envelope 12 was missing). On each envelope a schema determined the position of the sample (see carbon copy). Our research, as in previous reports, essentially involves the statistical study of the traces left by thermal action on coal. The thin film of dust on the surface of the shale pieces is carefully removed with a brush. This dust is coated in a polymerization resin. This sample is polished using the usual method. Each section was quantitatively analyzed in reflected light for the observation of approximately 200 particles subdivided into four categories." (My translation)

Petrographic study, CERCHAR,[438] 12 March 1959[439]

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[436] Typed report "Rapport sur la catastrophe du puits Vuillemin de notre camarade Pfeffer Henri, délégué mineur." (Report on the Vuillemin well disaster by our comrade Pfeffer Henri, minor delegate), November 1958, Dossier 1987CAITM1, CAITM, Saint-Avold, France.

[437] Le Monde. "Onze morts, quatorze blessés hospitalisés dont quatre sont dans un état grave." (Eleven dead, 14 injured hospitalized, four of whom are in serious condition) *Le Monde*, 24 November 1958.

[438] Centre d'Études et Recherches de Charbonnages de France (Study and Research Centre of the Collieries of France).

[439] Typed study "Étude pétrographique" (petrographic Study) by CERCHAR, 12 March 1959, Dossier 1987CAITM1, CAITM, Saint-Avold, France.

Appendix 6 – Document relating to the 1958 Vuillemin disaster, Petite-Rosselle, France

"We studied shale samples taken following the Petite Roselle accident of November 21, 1958.

Samples were in envelopes numbered from 1 to 14 (envelope 12 was missing). On each envelope a schema determined the position of the sample (see carbon copy). Our research, as in previous reports, essentially involves the statistical study of the traces left by thermal action on coal.

The thin film of dust on the surface of the shale pieces is carefully removed with a brush. This dust is coated in a polymerization resin. This sample is polished using the usual method.

Each section was quantitatively analyzed in reflected light for the observation of approximately 200 particles subdivided into four categories.

1/ non-melted grains (angular outlines)
2/ large fades (rounded, globular)
3/ semi-coke cenosphere (thick-walled grey tint)[440]
4/ Coke cenosphere (strong relief yellow hue thin walls)

Transition forms have been recognized in group 1: angular but lighter grains than normal grains (the same heating without fusion increases reflector power) and in group 3: intermediate-hued cenosphere between semi-coke and coke cenospheres."

(My translation)[441]

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[440] A cenosphere is "a low density, chemically inert and spherical material filled with air/inert gas (either nitrogen or carbon dioxide)." Danish and Mosaberpanah, "Formation mechanism and applications of cenospheres," 4539.
[441] CERCHAR, "Étude pétrographique." No page.

Appendix 7 - Report relating to the 1958 Vuillemin disaster, France (My translation)[442]

<pre>
Study 58.2.01   Simple report

Vuillemin Well Dust Examination
(Accident of November 21, 1958)

We received through Mr. C. samples from three sources:
a/ nine envelopes sent by the Metz Mines Department.
b/ a crystallizer (broken arrival) sent by Mr. C. des H.B.L.
c/ three pieces of shale sent by the Managing Director of Petite-Rosselle taken 25 cm
and 30 cm from the roof of a collapsed area.

METHOD OF STUDY/REVIEW
A polished section was made on the lower fraction at 200 μm of each sample. It is the
finest grains that best track the thermal effects of the accident. Each section was
quantitatively analyzed in reflected light for the observation of about 200 particles.
These particles were divided into four categories based on the heating experienced.

1.- Untouched coal particles, dark gray-hued +/- angular
2.- Molten charcoal particles, still gray color but rounded shape, sometimes without
angles in spherical blood cells. No swelling yet so no internal cavity.
3.- Melted, swollen and bubble particles or cenospheres with fairly large and flat
walls, variable grey hue. Are analogous to semi-coke cenospheres their hue is a function
of temperature. (All conditions are equal by the way).
4.- Coke cenospheres, thin or very thin walls, often themselves micro-bubbles high
relief, surface rounded by polishing, yellowish white hue.

All the proportions found are in the table above. The report that could be
characteristic of R/I has been added

R - grains that reacted
I - grains remained inert.

This report is therefore all the stronger because the thermal action has been more
violent. It should be noted that the maximum values reached are those of envelope n° 8
with 42% of coke cenospheres. This figure is even higher on the 3 pieces of shale with
R/I = 4.3 and 48% coke.

The thermal action in this last point is therefore undeniable. The landslide would in
fact have preceded the flame, unless one imagines that the deposit of the burned dust is
done for a certain time and is itself necessarily after the other two phenomena. The
look of a post-accident deposit is probably very different (more regular for example)
than that of dust stuck and burned in-situ, but these observations can only be made in a
gallery.

Note, however, that the dust burned on the shale was not glued but removed very easily
with a brush (while for the crusts burned on the spot it is necessary to scrape).

Finally, let us add to the interpretation of quantitative results that in all rigour
they should have focused on an average sample performed in a similar manner at all
collection points. It would be preferable in this regard for the laboratory to receive
the 3 shale samples in a dust case rather than dust alone because the scratching mode of
the wearer can significantly change the R/I ratio when that carrier is coal.

It is to avoid these disadvantages that we have worked on a very fine granulometry.
Moreover, ambiguity relates only to the inert fraction because the cenospheres are in
principle always ancient dust and cannot be particles torn from the wearer.

We cannot say anything about the geographical map of thermal actions as we do not know
the locations of the samples.

Director, The Physics Service,   Director, The Explosives Department,

L. Le Bouffant   B. Alpern
</pre>

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[442] CERCHAR. "Etude 58.2.01: Rapport simple," 12 March 1959, Dossier 1987CAITM1. CAITM, Saint-Avold, France.

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