

Anniversaries

Geological Map of France 200 years ago



THE CONTRIBUTION OF THE 1822 MAP BY JEAN-BAPTISTE JULIEN D'OMALIUS D'HALLOY TO THE GEOLOGICAL CARTOGRAPHY OF FRANCE

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In 1822, the *Annales des Mines* published an *Essai d'une carte géologique de la France, des Pays-Bas et de quelques contrées voisines*, established by J. J. d'Omalus d'Halloy according to materials collected in concert with M. le Baron Coquebert de Montbret. The map, approximately at the scale of 1/4 000 000, represents the diversity of the geological terrains of the territory of the French Empire in 1810 by 6 flat tints (Omalus d'Halloy, 1822).



Fig. 1 Jean-Baptiste Julien d'Omalus d'Halloy.
Portrait painting by Léon Herbo (1850–1907).
Source: Wikimedia commons

This map is the work of Jean-Baptiste Julien d'Omalus d'Halloy (1783–1875) (Figs 1, 2). It is based on geological and statistical data collected fifteen to twenty years earlier by Charles Coquebert de Montbret (1755–1831) and especially on field observations made by d'Omalus from 1807 to 1813, while prospecting the territory of the French Empire on foot. This first geological map of France had been deposited at the Conseil des Mines for nearly 10 years, awaiting publication. If the detailed geological map of France at the scale of 1/500 000, published by Dufrénoy and Elie de Beaumont in 1841 is rightly considered as the first modern geological map of our territory, this 1822 essay is the most widely recognized sketch (Gaudant, 1991).

As early as 1810, Coquebert de Montbret, chief editor of the *Journal des Mines* and director of statistics at the Ministry of the Interior, was asked to establish a mineralogical map of the Empire. Although he already had his own observations made a few years earlier, he also intended to rely on the work and data collected by the mining engineers (Laboulais, 2007). But, caught up in his responsibilities as director, he immediately entrusted this task to d'Omalus d'Halloy, a young geologist remarked on in 1808 for the exceptional quality of his study on the geology of Northern France. Born in Liege in 1783 and sent to Paris by his family in 1801 to acquire the salon culture considered essential to a man of society, his taste for Buffon's *Natural History* immediately led him to take another direction by following the courses of Haüy, Fourcroy, Vaucoulin and Cuvier at the National Museum of Natural History (Dupont, 1876).

He became fascinated by this emerging science called positive geology, and with a hammer in his hand, he travelled on foot through the whole territory that extended from Boulonais to the south of Mainz, that is to say 18 departments of the Empire, in the hope of contributing to its development. In 1808, the *Journal des Mines* published his *Essai sur la Géologie du Nord de la France* (Omalius d'Halloy, 1808). His work is based on Haüy's mineralogical nomenclature, which is often sufficient to describe the diversity of the rocks and terrains observed, but he goes beyond it by his attention to the fossiliferous contents and to the disposition of the terrains necessary to the reconstitution of the revolutions of the globe. Naming a terrain by placing it in the nomenclature of Wernerian geognosy requires detailed local studies, but d'Omalius favors the general organization of large territories. Faced with the diversity of the rocks that he observed while walking, he sought to identify groups, units. In the line of the physical geography dear to Coquebert de Montbret, he tried to identify natural regions, that is to say territories determined not by administrative limits but by the nature and the disposition of the rocks which compose it. These choices led him to structure the North of France into two major orders of grounds distinct by their nature and their disposition (always horizontal for the one, horizontal to vertical for the other) and eleven natural regions. The three most abundant substances are carbonated lime, quartz and shale. To establish this first geological study, d'Omalius walked more than 7600 kilometers. A tireless walker, the praise he received from the French geologists for this first geological work, pushed him from 1809 to undertake on foot the exploration of the immense territory of the Empire which extended then from the English Channel to the Garigliano, from the Weser to the Pyrenees. He devoted four years of travels to this task under the direction of Coquebert de Montbret, who was very busy with his other responsibilities. In 1813, he presented to the Institute his *Mémoire sur l'étendue géographique des terrains des environs de Paris*, which again earned him much praise, and submitted to the Conseil des mines his geological map of the Empire (Omalius d'Halloy, 1816).

The fall of the Empire in 1814 stopped the publication of this map and suspended d'Omalius d'Halloy's career as a geologist. Recognized for his qualities as an administrator, he was appointed the same year secretary general of the governor of Liège and then governor of the province of Namur. A new career then began which led him to publish in 1827 an administrative code for the province of Namur, the first work of its kind which quickly became a model for the other provinces of the Kingdom of the Netherlands. The king distinguished him in 1828 by appointing him State Councillor, until the revolution of 1830, which led to the independence of Belgium, put an end to this second career.

In 1821, Coquebert de Montbret wrote to d'Omalius to convince him to publish a mineralogical and agricultural map and an explanatory manuscript based on his work of 1813. Instead d'Omalius wanted a geological and stratigraphic map, the only one able to give an account of the geological history of the territory. The two men agreed to publish first a small-scale geological map in the *Annales des Mines*, and then a larger, more detailed map, complete with agricultural information (vineyards, olive trees and orange trees). Louis Becquey, director general of the Ponts et Chaussées and Mines departments, launched the project of a general geological map of France (Brochant de Villiers, 1841). The proposal was immediately accepted and the d'Omalius map was published in 1822 in the *Annales des Mines*, accompanied by an explanatory memorandum. Jules Gosselet, in his necrology notice, read before the Geological Society of France in 1878, declared that this small 24-page memoir "was nothing other than a true treatise on Geology " (Gosselet, 1878). The 1822 map was recognized as a direct precursor of the 1841 map, and even as the first geological framework of Western Europe by French geologists, notably by Elie de Beaumont and Dufrénoy. The large map, on the other hand, was never published despite its announcement. Dupont in his note on d'Omalius indicates that the authors had wished to use as a topographic base the one established by the cartographer Pierre de Belleyne (1747-1819), author since the time of the

French Revolution of several maps of France and its departments. But, writes Dupont, the owner of the engraved copper plates was opposed to this (Dupont, 1876, 255).

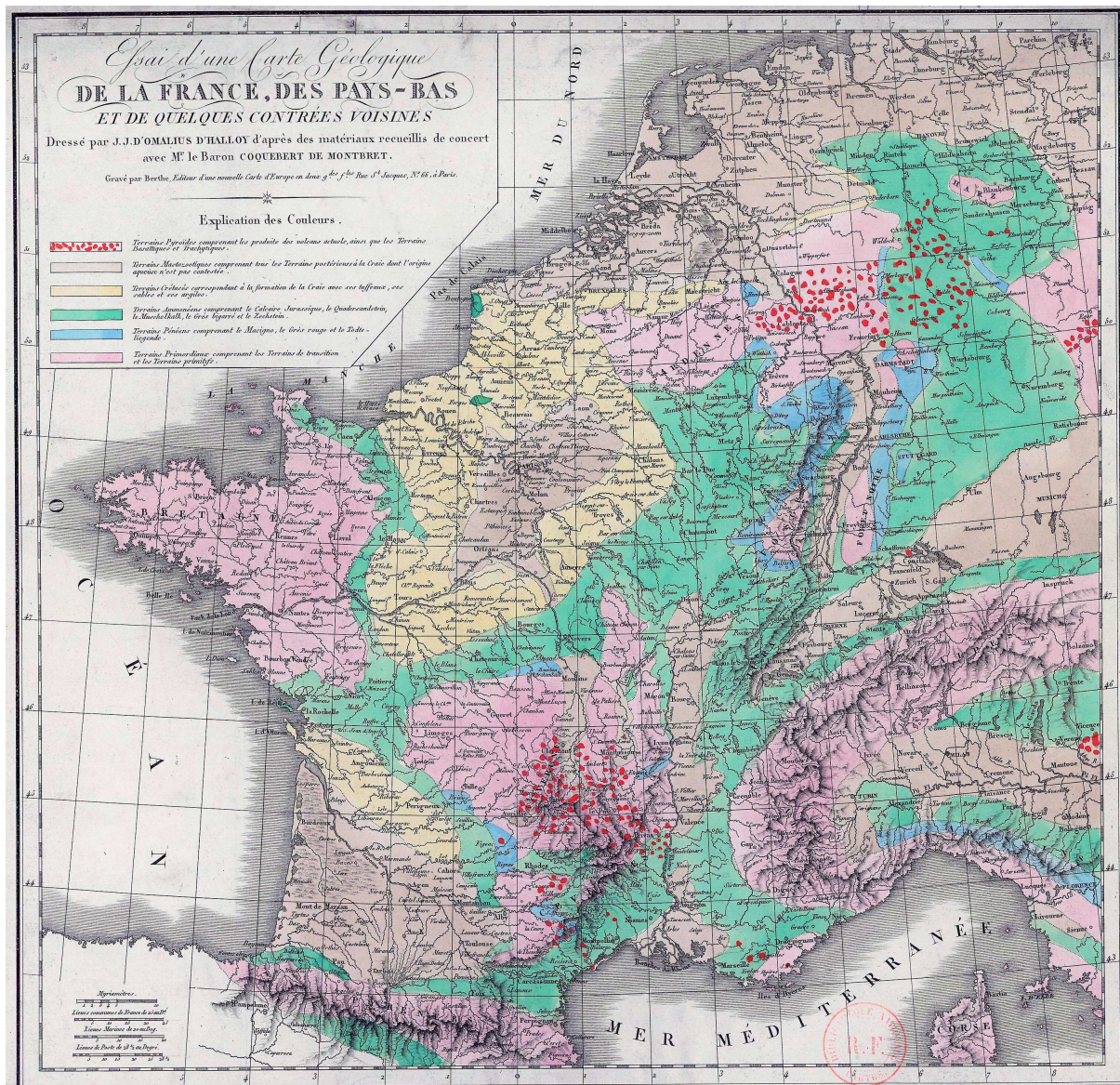


Fig. 2. *Essai d'une carte géologique de la France, des Pays-Bas et de quelques contrées voisines, dressées par J. J.d'Omalus d'Halloy d'après des matériaux recueillis de concert avec Mr le Baron Coquebert de Montbret, gravée par Berthe, 1822.* (Source Bibliothèque Nationale de France, <https://gallica.bnf.fr/ark:/12148/btv1b84944732>)

The geological map of France, Netherlands and some neighboring countries gathers the whole of the grounds within six stratigraphic groups: the primordial grounds, subdivided in primitive ground and ground of transition, the grounds péneens, ammonéens, crétaqués, mastozoïques and pyroïdes. The great geological units of France are outlined. The descriptive works realized by d'Omalus before 1813 are on the other hand a little outdated ten years later by the multiplication of local geological studies. A geological effervescence had by then seized France and Europe. The map was reissued in 1828 with a cartography of the South of England and three geological sections, with a volume bringing together the various explanatory geological memoirs already published (Omalus d'Halloy, 1828).

D'Omalus continued his work as a geologist from 1830 until his death, while serving as senator for the district of Dinant from 1848. His work "*éléments de géologie*" published in

1831 was republished seven times until 1868, in an augmented and completed version of the progress of this science. While he continued to do geology by travelling throughout Europe on foot, his geological publications were now more directed towards the teaching of geology than cartography. He was a member of the Royal Academy of Belgium and also member of many foreign learned societies. The Geological Society of France, which he joined at its creation in 1830, appointed him as its president in 1852. He is unanimously recognized as being the father of the geology of Belgium and as a great figure of French geology (Groessens & Groessens-Van Dyck, 2007).

The publication by the Ministry of Public Works in 1841 of the Geological Map of France compiled by the mining engineers Dufrénoy and Elie de Beaumont at a scale of 1:500,000 quickly caused the 1822 map to be forgotten. By offering a much higher degree of precision and detail and by serving as a framework for the geological mapping of France on a departmental scale, officially launched by the Ministry in 1835, the 1841 map was the first major production of French geological mapping.

1822 is a doubly important date for French geological cartography, because this same year France published the first general geological map of its territory and thus started the realization of the great geological map of 1841.

A beautiful relay passage to be saluted 200 years later!

Further Reading

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