Introduction

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Wilt thou wander on forever? See the good that lies so near.

Johann Wolfgang von Goethe wrote these words in his poem *Erinnerung—Memory (1789)*—but they could be equally used to describe the diverse geology of Germany. Situated in the middle of Europe, Germany offers a rich and diverse geological history which, compared to other countries, occurs in quite a small area. We do not have to travel to distant places to visit special sites of geological interest; here we find them virtually on our doorstep. The reason for the geological diversity is its special location in the middle of a structural crossroads during the last 500–600 million years. Here, the breakup and collision of continents and smaller continental plates took place. Oceans and open seas spread and subsequently disappeared leaving nothing but a few crustal remnants, and finally, mountain ranges formed that were leveled to the base we can observe today.

Despite Germany's diverse geology, a complete insight into its geological history is only possible when we include neighboring countries. In northern Germany, this is mainly due to the fact that the ancient basement is covered by thick sedimentary deposits and is therefore only accessible at the surface in the adjacent regions of Scandinavia and Great Britain or at specific points when penetrated by deep boreholes. Fortunately, due to the intensive exploration activities of the former GDR (German Democratic Republic), there exist now a large number of boreholes in the northeastern part of Germany.

In the south, only a very small part of the Alps belongs to the German nation. To understand the evolution of the Alps, it is therefore necessary to look at the development of the entire mountain range. This is similar in the west and east of Germany when studying the ancient mountain belts of the Rheinisches Schiefergebirge, the Erzgebirge, Riesengebirge, and the Bohemian Massif. They pass through Germany from Belgium and France and continue to Poland, Czech, and Slovakia. Germany therefore represents just one piece of an entire European puzzle. Therefore, political borders today are irrelevant when it comes to studying geological processes. Historically, however, the diverse number of languages and cultural approaches used has never made European geology an easy subject. International political divisions are here mentioned only for orientation purposes and to set limits for the study area. To understand the structure of the basement and the geological evolution of Germany and its surrounding areas, a division into subordinate tectonic units is necessary to define regions formed during a distinct epoch of geological time or involved in profound changes common to that time.

This textbook illustrates the geological history of Central Europe written in a comprehensible language. It is a diverse history, which involves the formation and disappearance of oceans and mountain ranges over the course of millions of years. Central Europe, most specifically, Germany, has always been located at the heart of this structural evolution. Here, the oceans of the Variscan Orogeny were closed and mountain ranges formed only to be subsequently eroded immediately after. The formation of the Alps also induced significant tectonic movements, which can still be observed today in the form of low mountain ranges lying adjacent to the older Variscan structures or more ancient tectonic lines.

M. Meschede and L. N. Warr, *The Geology of Germany*, Regional Geology Reviews,
https://doi.org/10.1007/978-3-319-76102-2_1