

Preface

WE ARE SURROUNDED BY and sometimes still use structures dating from the middle ages. Scholarship has recreated its political, economic, social and military history. Specialists debate the finer details of medieval science, education and technology. The architecture of cathedrals, monasteries, churches and castles is painstakingly examined and re-examined and their functions are explored in both academic conferences and the popular media. But there are fewer studies of the people responsible for these works. And even fewer of military engineers – who may well have been involved in both the construction and the destruction of military fortifications.

I began to ponder this even while completing my *History of the Early and Late Medieval Siege*. The names of engineers at war kept appearing in contemporary accounts, increasingly as more records survived. Evidently, by the time of the renaissance in Europe, a body of expertise existed that rulers called upon to fulfil their engineering needs, and some of those experts' names are well known today (if the number of exhibitions devoted to Leonardo da Vinci is any guide). It is also clear that engineering continued to be undertaken across the world even when there is no surviving record of it. But what had happened before?

I was at first anxious that it would not be possible to attempt this history because of a lack of evidence. Closer study suggested that, especially for the early centuries, it was necessary to offer rather more in the way of hypothesis than a historian ought to be happy with, and to read back from later reports into earlier times, something that also involved making unprovable assumptions. Nonetheless, there was sufficient to show that this king or that prince had successfully bridged a great river, or had built engines against a hostile fortress, or had laid out and defended a camp, or had diverted a river, and thus to identify that to have done so required having access to a degree of engineering skill that it was highly unlikely the rulers themselves possessed. That the necessary technical skills also existed can be confirmed from evidence in other fields: planning, layout and construction of buildings, hydraulic engineering (canals, dams, irrigation) or shipbuilding, all areas where archaeology has added immensely to knowledge of the past. Craftsmen built ships, houses or watermills with evident

skill. Although it can rarely be shown that the people who did the one also did the other, it can be demonstrated that craftsmen (anonymous) were mobilised for military campaigns.

This book is not about technology (although it does touch on some important debates about military technology), science or architecture. It is about the people who did the military engineering. It touches on many and sometimes continuing debates on connections between book learning and the “mechanical arts” and suggests a developing overlap starting in the earliest years after the end of the western Roman empire but also continuing through times once miscalled “dark”; it also poses questions about levels of literacy among the master craftsmen from whom military engineers were drawn, and while not being able to offer conclusive answers, suggests a growing awareness (if usually very limited) of what we would now call book learning.

I can find nothing to prove or disprove that for the most part, however, knowledge was passed on by the traditional master-to-apprentice route and involved memorising the rules, except to remember that it was not always just a matter of passing on how something had always been done: innovation and change took place that can only have been the result of someone making the decision to progress from what they had inherited to something different.

Military engineering is interpreted here in a broad way because the evidence suggests it covered many disciplines. It therefore includes the design, construction and operation of medieval artillery, a central part of the duties of many of the engineers who will be encountered. A separation of artillery from other forms of engineering would not begin to take place until well after the arrival of gunpowder artillery in Europe. It involved challenges such as bridge building and laying out camps – neither of them tasks that would necessarily leave any trace, either on the ground or in the written record. Indeed, we will see surveying skills – well attested in late antiquity – become invisible in their military sense for centuries, although they must have been there. From time to time there is evidence of the construction of immense mobile siege towers that confirm the presence of skilled military engineers, although more often the record only shows that the equipment was built. All these are military engineering roles. On the other hand, it will be shown that mining was traditionally a separate operation, reliant to a large degree on the skills of those who made their daily living from this work. Although non-specialists would regularly have been used for the hard labour in a military operation, underground mining in particular (but also sometimes surface-level sapping) called for specialist skills possessed only by such folk. The inclusion of “miners and sappers” among engineering corps to the present day testifies to the relevance of this approach.

Medieval military engineers, it will be seen, were a continuing presence, and by their often anonymous contribution – often in extremely dangerous and exposed situations – made a significant contribution to the outcomes of campaigns. The

noble commanders have always taken the credit. It is time to redress the balance a little.

Most of the book deals with Christian Europe, so dates are given using the Christian calendar. But I also deal with the continuing interaction with the Muslim world and discuss, with evidence from translated sources, the comparable levels of knowledge and technology there. Developments in military engineering across the known world, including Central Asia and China, are recorded, particularly at the times when they came into (sometimes violent, at other times more peaceful) contact. Where dimensions are quoted from medieval sources these are presented as they were written, reflecting the difficulty of offering precise modern equivalents: feet and inches originated in both Roman practice and other ancient civilisations and related to parts of the human body. I have offered metric equivalents of the original. Where measurements (particularly weights) matter to the interpretation, I have discussed modern equivalents. Personal names are spelt not according to any strict rule, but in order to be recognisable, and in the many cases where towns and cities and regions have changed their name I have applied the same simple approach. In many cases I have alluded to other, wider developments that provide context; readers can follow up references to relevant sources from the footnotes or bibliography.