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Book Reviews

The Normans in Europe
Elisabeth van Houts
Manchester University Press, 2000 (308 pages)
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Europe has a long and chequered history of trade, migrations, political and religious strife, alliances and treaties. Many of the momentous events that have shaped Europe as we know it took place centuries ago, in social and political contexts so remote from our present experience that they are difficult for most of us to appreciate. Reasonably educated European citizens have generally only been exposed to history textbooks focused on the making of their own nation state; they might remember dates of battles and treaties, but it is probably an understatement to say that they have a hazy view of the many strands that are woven in the rich cultural tapestry of Europe.

Thus, a Frenchman might know that the Vikings under Rollon (Rollo for the English) invaded Normandy and peacefully settled there; that Guillaume le Conquérant invaded England and that his wife made a tapestry at Bayeux. An Englishman would, of course, know of 1066 and all that. But neither the Frenchman nor the Englishman would presumably know the origins of the Norman kingdom in Sicily and Southern Italy (assuming they know there was one). Besides, what is the Norman identity?

The present book is primarily intended for undergraduate students in medieval history, but it is also a boon for any reader interested in knowing more about the fascinating story of Norman expansion in Europe. The 'source book' format allows the author – a lecturer in medieval history in Cambridge – to illustrate her chapters with selected extracts of the relevant chronicles or annals of the period, among which are the *History of the Dukes of the Normans*, written by the Norman court apologist Dudo of Saint Quentin toward the end of the tenth century, and the *Deeds of the Dukes of the Normans* of William of Jumièges, as well as the biography of the byzantine emperor Alexis Comnene written by his daughter Anna. This makes for an enlightening and lively portrait of the social and political landscape.

The author first introduces Rollo, or Rolf, the son of a Norwegian earl. Exiled after a quarrel with his lord, he travelled south, until he reached present day Normandy around the year 900. He was granted land, as a hereditary fief, by the Carolingian king Charles the Simple, and settled in Rouen. Dudo's chronicle relates the anecdote of how Rollo, unwilling to kiss the king's or, for that matter, anyone's foot, ordered a soldier to do it for him: 'This man immediately seized the king's foot, put it to his mouth and kissed it whilst the king was still standing. The king fell flat on his back.'

The invaders assimilated very rapidly to the Frankish population and it appears that few of the Scandinavian customs were retained. It is significant, however, that one of those that was

retained was exile (*ullac*). The ruler would banish, rather than execute, political or criminal offenders, thus getting rid of them while obviating the need for their kin to seek revenge for their death. The frequent use of exile by the dukes is probably one of the explanations of the Norman diaspora in Europe.

While preserving a large measure of independence from French kings, Rollo's descendants were very successful in controlling the building of castles and maintaining law and order, thus establishing Normandy as a stable principality. It is in Normandy, explains van Houts, that we have the first evidence that women could act as legal witnesses.

The chain of dynastic niceties and allegedly broken promises leading to the conquest of England in 1066 is clearly told – and this is no mean feat. We learn that, to ensure God's help, William the Conqueror and his wife offered their daughter Cecilia as an oblate to a nunnery – an event that was celebrated in a poem by Fulcoius of Beauvais, comparing William to Jephthah, who sacrificed his daughter to propitiate God, before a battle. One also thinks of Iphigenia at Aulis. The poem, quoted in its entirety, is well worth reading. There is no dearth of chronicles recounting the whereabouts of the battle of Hastings. It seems that if Harold had not been engaged in fighting his brother Tostig in the north, at the time William attacked in the south, the outcome might have been very different.… With what consequences for the future? Anyway, after delivering to his troops a rousing speech, which brings to mind the Saint Crispin's day address of Henry V before the battle of Agincourt, William carried the day. It will surprise no one to learn that chroniclers depict William's subsequent behaviour as ruler of England as praiseworthy or ignominious, depending on their political leanings.

In a feudal world, the relations between neighbouring powers were never simple. They were especially complicated with France since, as dukes of Normandy, William and his descendants owed allegiance to the French king, but were his equals as kings of England.

In 999, a group of Norman pilgrims came to the rescue of the inhabitants of Salerno, in Apulia, attacked by the Saracens. Thus, in this modest fashion, began what may be viewed as a protracted Norman conquest of southern Italy. More Normans were soon to follow, recruited as mercenaries by local dukes and princes who needed their help, as much against the Byzantines as against the Saracens. The Norman chiefs, of course, were not long in looking after their own interests and claiming lordships for themselves. Some of them, as we have seen, were political exiles; most of them, however, were younger sons of large families forced to emigration by the lack of land. Robert Guiscard, who became duke of Apulia and Calabria in 1059 was one of the 12 sons of Tancred d'Hauteville, lord of a small village near Coutances. His youngest brother, Roger, became count of Sicily, and Roger's son, Roger II, became king of Sicily in 1130.

In the twelfth century, Normans were thus present in a good tract of Europe, from the Scottish border to Sicily.

Elisabeth van Houts's synthesis of the selected excerpts of chronicles is very readable. One might almost dispense with reading the chronicles, but that would be a pity. The book ends with useful genealogies, maps and an index of names. It should be on the shelves of all those who have an interest in the history of Europe.

Jean-Paul Poirier

Greenwich. The Place Where Days Begin and End
Charles Jennings
Abacus, London, 1999 (242 pages)
£7.99, softback, ISBN 0-349-11230-4

Greenwich, a modest place in the suburbs of London, has the unique privilege of being famous thanks to an imaginary line, the prime meridian – usually referred to as the Greenwich meridian. In contrast with the equator which has, roughly speaking, a physical definition, the choice of a prime meridian was entirely open. The name of Greenwich became known to almost everybody when an international conference, held in Washington in 1884, adopted as the prime meridian the one passing through the centre of Airy's meridian circle at the Greenwich Observatory. Thus, Greenwich divides the eastern and western hemispheres. Difficulties in strictly implementing the 1884 definition led to a progressive shift of the prime meridian, which has presently shifted more than 100 m from its original place. Some astronomers complained about this fact as early as in the 1920s, but the meridian still passes through Greenwich and is rightfully called the Greenwich meridian. The 1884 conference also selected the Greenwich meridian to reckon universal time. However, the name Universal Time, which later was officially adopted, never became as popular as the more descriptive GMT.

For astronomers and sailors, Greenwich raises some nostalgia. The Royal Greenwich Observatory, the home of prestigious Astronomers Royal since Flamsteed laid the corner stone on 10 August 1675, is now a museum. Its scientific activities were progressively transferred to Herstmonceux Castle in Sussex during the beginning of the 1950s, then dispersed around the country. More recently, even the name of the scientific institution disappeared. The determination of longitude at sea, which concerned the astronomers and the clock makers, was totally solved by the emission of radio time signals, disseminating GMT, and these signals were, in turn, made obsolete by the satellite Global Positioning System. What remains of this active period of discovery can be seen in the National Maritime Museum, especially the beautiful Harrison chronometers, and in the Observatory Museum.

The scientific role of Greenwich is reported in two chapters of Jennings' book. As an astronomer and former sailor I gave way to the temptation to read them first and I was most pleased by their richness and their accuracy. I was fascinated by the alert and evocative style and by the humour of the author, qualities that extend, of course, to the whole book. I discovered later in the book that the rise and fall of science is somewhat typical of other aspects of the life of the city. At the time of Roman occupiers, Greenwich was a small fishing village. It remained obscure until King Alfred settled the place on his daughter Elstrudis in 899 and thus started the history of royal Greenwich. It took, however, five centuries before the 'building of some of the most extravagant pieces of architecture in the country'. Unfortunately, many of the palaces disappeared to leave room to new ones, which later were altered and damaged when the royal connection with Greenwich came to an end at the beginning of the nineteenth century. Fortunately, the most significant buildings passed the dangerous period between decay and restoration and can now be seen and admired.

Jennings relates the maritime life of Greenwich, its apogee and decline, the contrast of wealthy residences of the eighteenth century and modern buildings, and adventures such as the grandiose project of Searles's Circus, which was never finished and was, indeed, never

a circus. He also leads us in the world of workers, in the fairs, in the taverns and finally to the controversial Millennium Dome.

It was a difficult task to evoke the life of a city over two millennia when it has so many facets as Greenwich. Neglecting a strict chronological order, Jennings has chosen to treat each aspect separately, in chapters with titles such as Maritime, Royal, Working, Wealthy, Arty, Consumer, Scientific, Dome. Each of these chapters can be read almost independently. There is a sort of miracle in the style of Jennings. The abundance of information witnesses his immense erudition. It could have been boring, but it is not. On the contrary, Jennings knows how to communicate his enthusiasm and reading his book is a rare pleasure. When you have finished, you may have forgotten many details but, if you are not familiar with Greenwich, you have got in your mind a vivid image of the city and of its history. Is Greenwich as you imagine it? You will surely have the desire to check.

Bernard Guinot

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The Coming of Materials Science
R.W. Cahn
Pergamon, 2001 (568 pages)
130 NL guilders, hardback, ISBN 0-08-042679-4

Legend sometimes has it that a blacksmith forging a mythical sword could make it hard enough for a hero only by plunging it red hot into the body of a slave. In the middle ages, a prince desirous to donate a bell to his church would provide the founder with a quantity of gold and silver to be added to the brass. If the peals of the bell did not reverberate long enough, it would immediately make it clear that the precious metals had been abstracted for more mundane purposes, with dire consequences for the dishonest founder.

Is there some scientific truth underlying these tales? Yes, indeed. The steel of the sword was quenched and hard carbides could form superficially by interaction with the carbon of the slave's body. Gold and silver in the bell alloy form very hard inter-metallic phases, with low internal friction, and their absence would cause the vibrations of the bell to damp rapidly. But these interpretations had to wait for 'The coming of materials science'.

This is the title and subject matter of a thick book by Robert Cahn, a distinguished metallurgist (or 'materials scientist' in modern parlance) who has, for many years, contributed to the progress of his discipline and cultivated an interest in its history.

In the very first pages, the purpose of the book is clearly stated: 'The entire book is about the emergence, nature and cultivation of a new discipline, materials science and engineering'. A lapidary sentence sums up the evolution of the field: 'Out of metallurgy by physics comes materials science'. But Cahn cunningly waits until page 409 to make us aware that he had not yet exactly defined what a material is, and finally to give his own definition: 'A material is a substance which is then further processed, shaped and combined with others to make a useful object'.

The architecture of this rich book is not immediately apparent, as it intimately mixes history and recent advances in materials science, without too much regard for strict chronological progression. This is doubtless due to the fact that the story of materials science has developed in a very non-linear fashion. Precursor disciplines evolved, branched into sub-disciplines (for which Cahn coins the word 'parepisteme'), which in turn branched, grew, or fused together, to reach the current state in which the materials scientist should turn into some sort of a renaissance scholar, conversant in many fields.

We find modern history in the chapter 'The escape from handwaving', where it is recounted how the riddle of the plastic deformation theory of metals was solved by the introduction of the concept of dislocations in 1934, and how these crystalline defects, were finally observed in transmission electron microscopy, after 20 years or so of a purely theoretical existence. The title of the chapter 'Craft turned into science', dealing with steels and ceramics, is self-explanatory, as is that of the chapter 'The polymer revolution'.

On the other hand, the reader is taken for an excursion into the most advanced fields of present day materials science with the chapters 'Functional materials', 'Materials in extreme states', 'Materials chemistry and biomimetics' or 'Computer simulation'. The book ends with chapters devoted to 'The management of data' and 'The institutions and literature of materials science'. A wealth of references makes it an invaluable source book both for historians of science and practising materials scientists.

Cahn has personally known many of the most important characters in the saga of materials science, and reminiscences and photographs enliven the book. Anecdotes also abound. Thus, for instance, the origin of the term 'bug' in computer lore is revealed to us.

I was interested by the philosophical aside about the relevance and value of the concepts of 'purity' versus 'impurity' in materials science. The notion that intentional impurity (alloying or doping) is often highly beneficial took a very long time to be acceptable, says Cahn. But, why did he stop there when a beautiful parallel could be drawn with the couple 'perfection' versus 'imperfection'? Indeed, if perfect crystals existed they would be practically useless: deformation and diffusion, for instance, are only possible because there are beneficial 'defects' in crystals.

The importance of careful analysis of trace elements is illustrated by the work of Clair Patterson 'who made his life's work to assess the origin and concentration of lead in the atmosphere and human bodies' and thanks to whom we now have lead-free gasoline. Quite right, but it is a pity that the major scientific contribution to which Clair Patterson was led by the analysis of lead isotopes was omitted: the determination of the age of the Earth – without doubt his enduring claim to fame.

This, however, is nit-picking. This remarkable book should be required reading for historians of science and, of course, for all materials scientists. The readership could also include physicists, chemists and engineers whose trades bring them in contact with materials. And even though they may find it a bit difficult in places, lay readers might find in this book enough fare to satisfy a curiosity about the materials that shape their lives.

Jean-Paul Poirier

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Virtual University? Educational Environments of the Future
Henk J. van der Molen (editor)
Portland Press, London, 2001

The widespread development of the Internet and other Information Technologies has led to the suggestion that the traditional university is doomed and will be replaced by some electronic system. This volume records the results of conference organised by the Academia Europaea with the Wenner-Gren Foundation to explore the present state of developments and forecasts for the future.

It is as well to be reminded that the impetus for change is not simply a result of new technologies being available, but also in response to new demands in higher education. The first of these is the general desire in the Western world to extend higher education to a high proportion of the population. Formerly under five percent of the population attended universities and a considerable fraction of these were in professional faculties like law and medicine. This new cohort has lower initial educational levels and also some different educational objectives from the traditional university entrant, being less likely to see a future in academic life and rather seeking a sound basis for a career in industry or administration..

There are some obvious points at issue, for instance the increase in size of universities has decreased the possibility of the close connection between student and mentor that many found to be the most valued feature of their university years and it is difficult to see how this can be re-instituted. There is also the fact that we are living in a rapidly changing world, mainly due to technical advance, this means that it is not enough to turn out graduates who are acquainted with the latest information, but they must know how to keep up with changes, which includes a role for the university but also other ways of providing for lifelong learning.

The alternative to residential higher education has been well and successfully explored by "open universities" across the world, but up to the present they have not shown signs of superseding the conventional university being largely a parallel approach particularly suited to those who wish to remain in employment while improving their education. However, it is by no means clear that this balance will remain. One of authors in this symposium drew the parallel to the growth of trans-oceanic air traffic. To begin with air transport was expensive and not taken to be the normal way, so that ship operators made their plans on the assumption that the status quo would persist and could not foresee that their future as passenger carriers would essentially disappear with the arrival of mass air transport. It is a telling analogy and one that all those connected with universities should consider seriously.

This volume has thoughtful articles dealing with many aspects of how a virtual university might operate and can be strongly recommended.

Arnold Burgen