

Grenville Arthur James Cole (1859–1924): the cycling geologist

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Abstract: Grenville Arthur James Cole (1859–1924), Professor of Geology at the Royal College of Science for Ireland, was an avid cyclist and shared this passion with his wife Blanche. Born in London, Cole studied at the Royal School of Mines and lectured for a number of years at Bedford College for Ladies. Largely concurrent with his professorship he served as Director of the Geological Survey of Ireland at a time when it was in moderate decline.

He undertook many cycling tours around continental Europe and Ireland. These trips were recounted in two early travel books. *The Gypsy Road: a Journey from Krakow to Coblenz*, published in 1894, provides a delightful account of a tour undertaken by him on a tricycle and his companion on a penny farthing, across what is now Poland, the Czech Republic, and eastern Germany. In a later slim volume entitled *As We Ride*, co-authored with his wife, a number of expeditions to France and the Balkans are eloquently described. Between 1902 and 1908 he organized a week-long geological excursion to various parts of Ireland for his students, and transport was by train and bicycle.

His cycling trips provided him with the opportunity to collect research materials, make geological observations, and to photograph features of interest. Subsequently much of this material was used in his publications and in teaching. Cole's main academic studies were in igneous and metamorphic petrology. He valued and promoted fieldwork as an essential component of geological training. He was heavily involved with professional and amateur scientific societies, and was a prolific author of both academic and popular geological papers and books.

To those who laid from west to east
The clear white road for man and beast;
To those who in our age of steel
Set the true frame and shaped the wheel;
To those whose greeting calls again
From the brown acres of the plain,
Or through the pathways of the firs,
Our equal friends and wayfarers;
To him who at each sunset post
Held wide the door, our welcome host;
To these, on many a country-side,
Our thanks be given, as we ride.¹

Since the seventeenth century, men and women have been travelling parts of the globe in search of rocks and geological structures that could elucidate something of the Earth's history. They have travelled by many different means: James Hutton, William Buckland and early Geological Survey mappers preferred the use of horses, Roderick Impey Murchison and his wife travelled by horse-drawn coach (Kölbl-Ebert 2007); whereas the fossil fish-collectors William Willoughby Cole, the third Earl of Enniskillen (1807–1886) and Sir Philip de Malpas Grey-Egerton (1806–1881) were among those gentlemen 'geologists' who made Grand Tours of Europe during the eighteenth century. Rail travel prevailed in the early twentieth century but has now been overtaken by the motorcar. In remote areas such as Africa, geologists have resorted to canoes, or their feet. At one point towards the end of the Victorian era, cycling was very popular.

The earliest wheeled vehicles were in use in Mesopotamia around 7000 years ago, but it was not until late in the eighteenth century that self-propelled two-wheeled machines first appeared. These were the so-called 'hobby-horses', which were awkward and heavy, consisting of two large wooden wheels and with a saddle fitted to a rigid crossbeam. They could not be steered easily and were propelled by the rider running his feet along the ground in a 'Fred Flintstone' manner. These machines were particularly popular with the aristocracy of the late 1700s and early 1800s. Not content with this self-powered propulsion, early nineteenth century inventors toyed with pedals, levers and chains in an attempt to perfect efficient mechanical movement. The first recognized bicycle was built by a Scot, Kirkpatrick Macmillan (1810–1878), in 1839. A replica of his machine may be seen in the Science Museum, London. From this start evolved the hard riding 'boneshakers', which were large and heavy, like the earlier 'hobby-horses', but which were easier to ride. They came in many shapes and sizes; although two-wheeled versions were the most prevalent, three or even four-wheeled machines were not unheard of. The introduction of the boneshaker had important social implications. They were relatively cheap at £10 (in the 1860s) and so bicycling became available to the general public. Two further advances were yet to come before modern machines took shape: the first was the advent of the light triangular-framed machines

typified by the 'ordinary' (or 'penny-farthing'), which was followed, in the 1880s by the chain-driven 'safety'. The second advance was the invention of the pneumatic tyre by John Dunlop (1840–1921) in 1888. This tyre is now on display in the Royal Scottish Museum. Dunlop was a Scottish veterinary surgeon working in Belfast. Soon after 1888 he moved to Dublin where his pneumatic tyres were manufactured (Cooke, undated). At last bicycling had become a comfortable means of transport and available to all.

Where do geologists fit into all this? Bicycling fever swept through Victorian Britain and many touring clubs, of which the Cyclists' Touring Club was the premier, were established. Such enthusiasm slowly spread to the United States so that by the early years of the twentieth century the pastime was as popular as in Britain (Smith 1972). Any volume of material was provided for cyclists: publications included periodicals such as *The Cycling Mercury*, *The Cyclist*, and *The Wheel World* (edited in part by Henry Sturmev noted for his gear set-up); maps on which the most suitable routes were marked;² guide books complete with profiles of routes showing gradients (Inglis 1896, 1897, 1908); manuals on how to repair tricycles and bicycles; and listings of the cycling clubs and hotels that welcomed touring parties (Spencer 1884). There was considerable debate about the merits or otherwise of cycling for women. This activity for females was promoted by a Miss Erskine and others (Erskine 1884, 1896, 1897; Graves *et al.* 1898) but its dangers were pointed out by others, including a Mr Ryley (1899). Catalogues advertised clothing that was both suitable for lady cyclists and which retained their modesty.

It is hardly surprising that some geologists should become committed cyclists. The bicycle widened the field area for research and allowed the rider to become personally entwined with the landscape, a feeling that could never be adequately attained by rail travel. In the United States, Helen Margaret Duncan (1910–1971) a specialist on Bryozoa and Geological Survey palaeontologist from 1942 until her death, was apparently a keen cyclist (Flower & Berdan 1977). In the British Isles, the Geologists' Association, a group of professional and amateur members, undertook a number of excursions by bicycle in the 1890s and early 1900s (Green 1989; Robinson 1990). This mode of transport was championed by J. F. Blake formerly Professor of Geology at Nottingham and by H. W. Monckton. After a short time their enthusiasm for the wheel fizzled out. However, the individuals Sydney Savory Buckman (1860–1929) who was an ammonitologist, and Grenville Arthur James Cole (1859–1924) (Figs 1 & 2) an igneous and metamorphic petrologist, were both committed



Fig. 1. Grenville Arthur James Cole (1859–1924) (by permission of the Geological Society of London).

cyclists. In eighteen months from the date of his purchase of his first pneumatic-tyred bicycle, Buckman covered 3000 miles, principally engaged in examining various Mesozoic successions in Normandy and around his home in the Cotswolds (Buckman 1898). Buckman, together with his wife, established the Western Rational Dress Club that advocated that women wore a knickerbocker costume. In 1900 he seriously damaged his health through over-exertion in the saddle (Torrens 2004).

Of these cyclists it is the little-known Cole who has left most written and other material relating to his cycling activities and from this it may be seen how cycling influenced his geological and geographical work.

Biographical notes

Grenville Arthur James Cole was born in London on the 21 October 1859, the second son of John Jenkins Cole, architect to the London Stock Exchange (Wyse Jackson 1989). He was educated at the City of London School, and in his final year began to attend the lectures of Professor John Wesley Judd (1840–1916) at the Royal School of Mines. These captivated Cole, and although he was not destined to enter university, he managed to embark on an academic career in geology. Judd recognized Cole's potential and in 1878 appointed him as demonstrator to the school, a position he held for 12 years. During this period from 1886



Fig. 2. Grenville Cole and Blanche Cole (1862–1927) with a friend (standing at left) pausing during a rain shower while on a cycling trip somewhere in Ireland, c. 1900. Photograph by John Joly, Professor of Geology and Mineralogy, Trinity College, Dublin (1897–1933) (Joly Collection, Geological Museum, Trinity College, Dublin).

until 1890, Cole was also Head of the Geology Department at Bedford College for Ladies. Soon after he left London, a student geological society was established and named in his honour. Bedford College was later incorporated into the Royal Holloway, part of the University of London, which appropriately still awards an annual Grenville Cole Travel Bursary which funds a student to engage in research.

In 1890, Cole was appointed Professor of Geology and Mineralogy at the Royal College of Science for Ireland in Dublin (Kelham 1967) (only a 5 minute cycle from Dunlop's tyre factory), in succession to Edward Hull, and he retained this position until his death thirty-four years later. This institution had been established to provide education in science as applied to agriculture and industry and also training for teachers destined for the technical and secondary schools. Cole was later appointed as Director of the Geological Survey of Ireland in 1905 and was active in most of the societies that promoted science and natural history in Dublin. These were the Royal Dublin

Society, the Royal Irish Academy, the Dublin Naturalists' Field Club, the Dublin Microscopical Club and the Irish Geographical Association. He was a member of a close-knit group of scientists who used to meet for buttered toast and tea in a refreshment room adjacent to Trinity College, Dublin.³

In 1896, Cole married one of his first students in Ireland, Blanche Vernon (Fig. 2), the daughter of Colonel J. E. Vernon of Clontarf Castle, a wealthy Dublin landowner, and the couple had one son, Vernon, who later joined the East African Civil Service, but subsequently practised as a medical doctor. Blanche, like her husband, was an enthusiastic cyclist, and together they travelled extensively in Europe, as well as in Algeria and Tunisia. According to the botanist Robert Lloyd Praeger, Cole's best man, after their wedding ceremony the happy couple mounted their bicycles, cycled down the aisle, and embarked on their honeymoon! (Praeger 1941, p. 272).

Towards the end of his life, rheumatoid arthritis progressively crippled Cole, but he remained characteristically cheerful and active. Grenville

Cole died on 20 April 1924 at the age of sixty-four, and Blanche only survived him by three years, dying at the same age on 17 November 1927. They are buried together in Dean's Grange Cemetery in south County Dublin.

During his career Cole received numerous awards. He was awarded the Murchison Medal of the Geological Society of London in 1909; was President of Section C (Geology) at the 1915 British Association for the Advancement of Science; was elected a Fellow of the Royal Society in 1917; and received the degree of Doctor of Science (his only degree) from Queen's University, Belfast.

Grenville Cole was a small man who stood little over five feet tall, but who had endless energy. He would frequently walk 14 miles to and from work each day, and he expected his students to work hard. He was a superb lecturer, field geologist and teacher, who had a captivating wit and a sparkle in his eyes.

Cole's geological work

At the Royal School of Mines, Judd advocated the use of practical methods (field studies, excursions and practical classes) to complement lectures. There was a shift in emphasis from the lecture theatre to the laboratory, so that by the turn of the century, practical classes, demonstrations, and field classes were soon practised in many university departments in the British Isles and on the Continent. Cole was responsible for much of the planning and teaching of the practical element of the geological courses. The job of demonstrator also allowed him time to pursue extensive research interests.

After 1890, his duties at the Royal College of Science in Dublin were to organize and deliver lectures to various groups: agricultural students, science students and student-teachers. In an average year he or his assistant gave approximately 80 lectures. His assistants at one time or another included Louis Bouvier Smyth (1883–1952), later Professor of Geology and Mineralogy at Trinity College and Isaac Swain (1874–1963), later Professor of Geology and Geography at University College Cork.

Cole's career may be divided into two periods where the thrust of his research was quite divergent. This first period was up until 1895 during which time he worked largely on petrology and the illustration of textures and relationships within igneous and metamorphic rocks; in 1889 the Geological Society of London awarded him the Murchison Fund for this work. At this time he travelled extensively in Britain, collecting Scottish basalts and Welsh volcanic rocks.

Later he became more involved in the promotion of fieldwork and the study of physical geography.

He advocated the teaching of geography in universities and helped raise the profile of the subject (Herries Davies 1977). He was a prolific author of both academic and popular geological papers and books and has over 500 papers to his name (Wyse Jackson 1989).

The cycling geologist

Inspired by Judd's teaching Cole began to comprehend the importance of outdoor field studies in geology. Perhaps in response to this, he began cycling. In the preface of *Open-Air-Studies: an Introduction to Geology Out-of-Doors* which resulted from first-hand field experience he wrote 'Now-a-days, when cycling is so frequent and so free a means of travel, the geography and geology of nearer Europe have become keen realities to many of us . . .' (Cole 1895a). Field studies were an aspect of the science that preoccupied his thoughts and many of his publications for the rest of his life. Cole was an avid cyclist (Wyse Jackson 1991)—this cannot be emphasized enough.

Apart from his cycling tours Cole travelled widely. He visited Canada in 1897 and South Africa in 1905 to attend the meetings of the British Association for the Advancement of Science and regularly attended when it met in Britain.

Reconstructing Cole's travels

Using various lines of evidence, I have established the routes of many of his cycling tours. Of most value in this exercise were his two travel books *The Gypsy Road* (Fig. 3) (Cole 1894c) and *As We Ride* co-authored with his wife Blanche (Cole & Cole 1902), as well as his geological textbooks illustrated with his own photographs and any scientific papers similarly illustrated. These include papers on Algeria (Cole 1918a, b) and Spitsbergen (Cole 1911b) which he visited in 1911 during an International Geological Congress meeting. An unexpected bonus, and source of valuable information about some of his European and British travels, was his collection of rocks found in the basement of the Museum Building in Trinity College, Dublin. These were still wrapped in scraps of annotated newspaper, which gave some indication of when and from where he had collected the specimens. Fortunately Cole had very distinctive, clear handwriting, and he habitually wrote in black ink, and it is not possible to mix this up with that of other hands. His student field guides produced for the student field trips, together with a recently discovered manuscript map of Ireland provided valuable information. On this dissected map he had marked many routes travelled by him

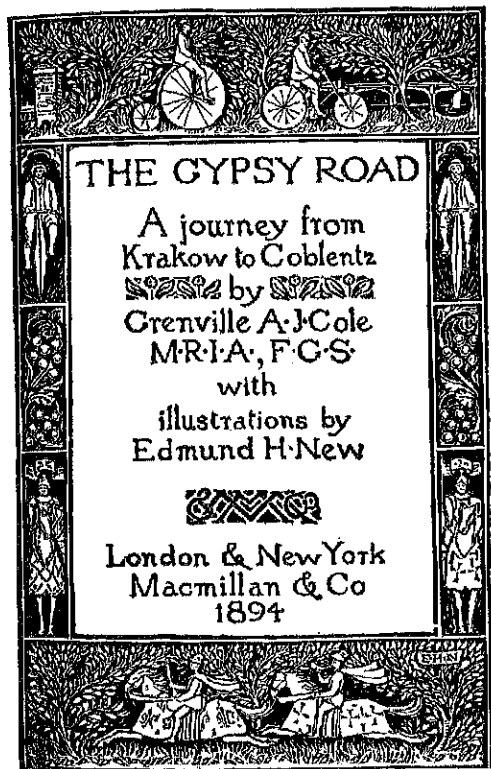


Fig. 3. Title page of *The Gypsy Road* (1894).

in red ink and added some information about hotels, hostels and local geological stops.⁴ Grenville and Blanche also kept a large map of Europe in their home and this was marked with the routes of their cycle tours. Unfortunately this was probably discarded after their deaths.⁵

Travels around Continental Europe

The Gypsy Road

By 1894, Cole had completed journeys on a Humber-Beeston tricycle through Italy and Bohemia in 'tandem' with a companion Gerard W. Butler who rode a penny-farthing (Fig. 4). Cole had owned his machine since 1884 and had used it on several trips. He was very proud of this tricycle and said that ownership of it opened doors throughout Europe. He had dined with the famous Hunnia Cycling Club of Pest and frequently was joined by local cycling groups. Arising from these trips came papers on volcanic rocks of Lipari (Cole & Butler 1892), Italy, the Vosges, Germany (Cole 1887) and parts of France (Cole & Gregory 1890).

In the summer of 1892, he travelled to Hungary to compare the volcanic sequences found there with those Irish examples already familiar to him (Cole 1892*b*, 1894*b*). Following this journey he wrote *The Gypsy Road*, a highly entertaining, perceptive and lucid travelogue and social commentary (Cole 1894*c*). This was described in *The Times* as being a 'breezy narrative of a cycling tour in out-of-the-way regions'.⁶ It recounts a journey of 1055 miles westwards from Krakow to Coblenz, through what is now Poland, the Czech Republic, Slovakia and Germany (Fig. 5), which Cole and Butler completed in 38 days in 1892!⁷ In fact, not content with travelling in one direction, Cole actually cycled from the town of Zolyom over the Sztur-ez Mountains with another friend before rendezvous-ing with Butler in Krakow. Butler is named throughout the narrative the 'Intellectual Observer' and comes across as being a man of quiet wit and perception. Cole, on the other hand, is the extrovert of the pairing. Little is known of Butler and his background; he enjoyed painting, held a B.A. degree, and may have been a Cambridge graduate in mathematics. In response to a question from a native as if whether there were any mathematicians in England, he replied 'A few perhaps at Cambridge'. (Cole 1894*c*, p. 127). They did not find everything plain cycling. The local police in places had some reservations with their visas, they were taken for travelling salesmen in other towns, horses were scared of their machines and they had to contend with bed-bugs or being chased by geese or by fifty children—one wonders which is worse. They coped with high temperatures in Bohemia where by mid-day it was 90°F. On 19 August between noon and 7.30 pm they consumed in total 1 large flask of sparkling water, two cups of tea, 3 glasses of water, one hot coffee, two iced coffees, and ate only three small rolls and one half slice of Hausbrod. This Cole stated 'express[es] the situation better than any thermometric record' (Cole 1894*c*, pp. 135–136). In one Czech village they arrived at the inn and asked for a room for the night. Unfortunately they enquired in German and were refused. Somewhat alarmed, as it was approaching dusk and the next village was several miles away, they went to the police station where they received the same cold-shoulder treatment. When the villagers realized that they were English and not German they were immediately received with open arms. The best room in the hotel was made available to them and their conveyances were parked in another guest room. On asking why this transformation in attitude to them had taken place, they were told that although the locals could speak German, they certainly did not speak it to Germans! Elsewhere they encountered this antipathy to Germans; they were asked

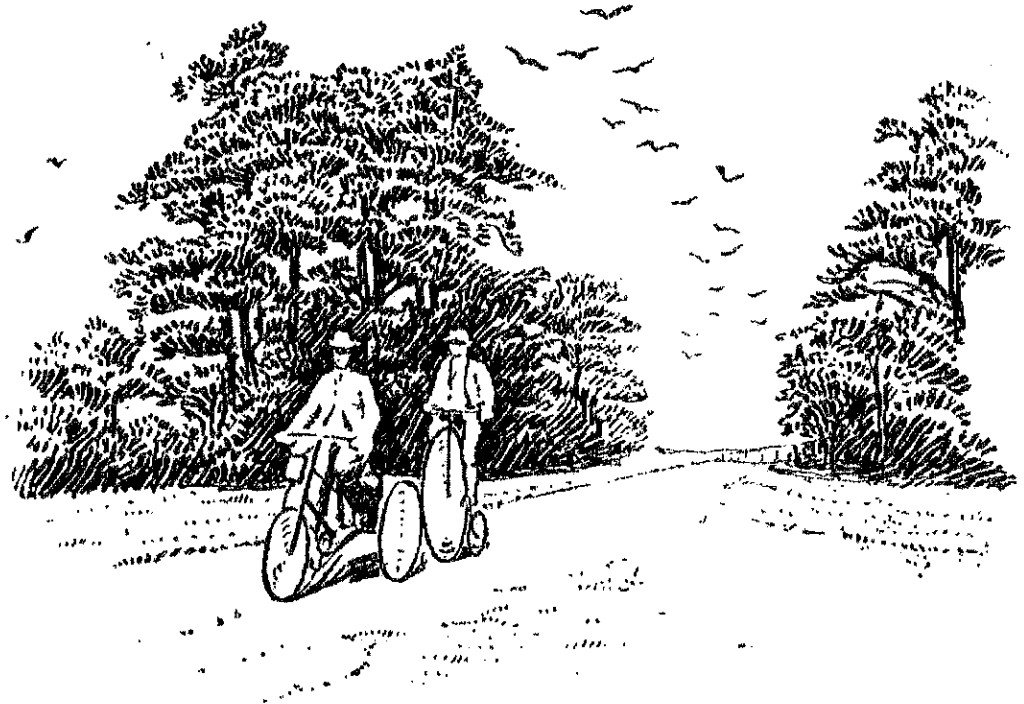


Fig. 4. 'Homeward Bound': Grenville Cole (on the Beeston-Humber tricycle) and Gerald W. Butler (on the penny-farthing) cycling through Europe in 1893 (tailpiece from *The Gypsy Road*, facing p. 166. Drawing by Edmund H. New).

'Are you Christians? Or are you Germans, perhaps?' (Cole 1894c, p. 80).

Geologically this trip was interesting and diverse. From Poland they travelled south, passing through Myslenice, which had been visited by the mineralogist François Sulpice Beudant (1787–1850) in 1818,⁸ into the Hungarian alluvial plains, before crossing the limestones of the Tatra Mountains. They then entered the region of the northeastern fore-Alps and the Hungarian Alps where they cycled over Cenozoic sediments, Mesozoic limestones and occasionally encountered crystalline basement rocks. At Garam they swam in the meandering river before cycling through the rolling volcanic countryside in the moonlight. Near Hajnik they visited the ancient gold mining region of Schemnitz, which had been renowned as being the most important centre for the metal in the Austro-Hungarian Empire. Nearby the travellers collected obsidian and Cole was able to examine the local rhyolites in some detail. Thanks to an invitation by Dr Cseh, a government geologist, they were able to venture underground into the huge silver mine at Schöpferstollen where they walked through the workings for over two hours, accompanied by a

mine manager and two small Slovakian boys who carried the lanterns.

They found the expansive Hungarian Plain, underlain with unconsolidated sediments, rather tedious, and Cole compared it with Salisbury Plain in England. In Hungary they followed in the tracks of the earlier traveller Richard Bright (1789–1858) who has been described as being the 'Father of Nephrology' who had been there in 1815 (Bright 1818). Once in Moravia they passed over Miocene conglomerates and noted the breathtaking local geomorphology: 'It is wonderful what amount of rock has to be cut away before you can make a decently artistic mountain'. In Prague they met with Antonín Fric (1832–1913), who worked in the Museum of the Czech Kingdom in Prague and was Director of Palaeontology there from 1880. He arranged for the travellers to visit the volcanic regions to the north of the city, and they spent a number of days examining the rocks around the vale of Algersdorf and climbed various volcanic cones such as the GELTSCHBERG where rare exposures of white phonolite could be seen. In Britain, Cole had seen the only exposure of this rock type at the Wolf Rock in Cornwall, and rejoiced in 'the joy of riding in Bohemia from one crag to another,

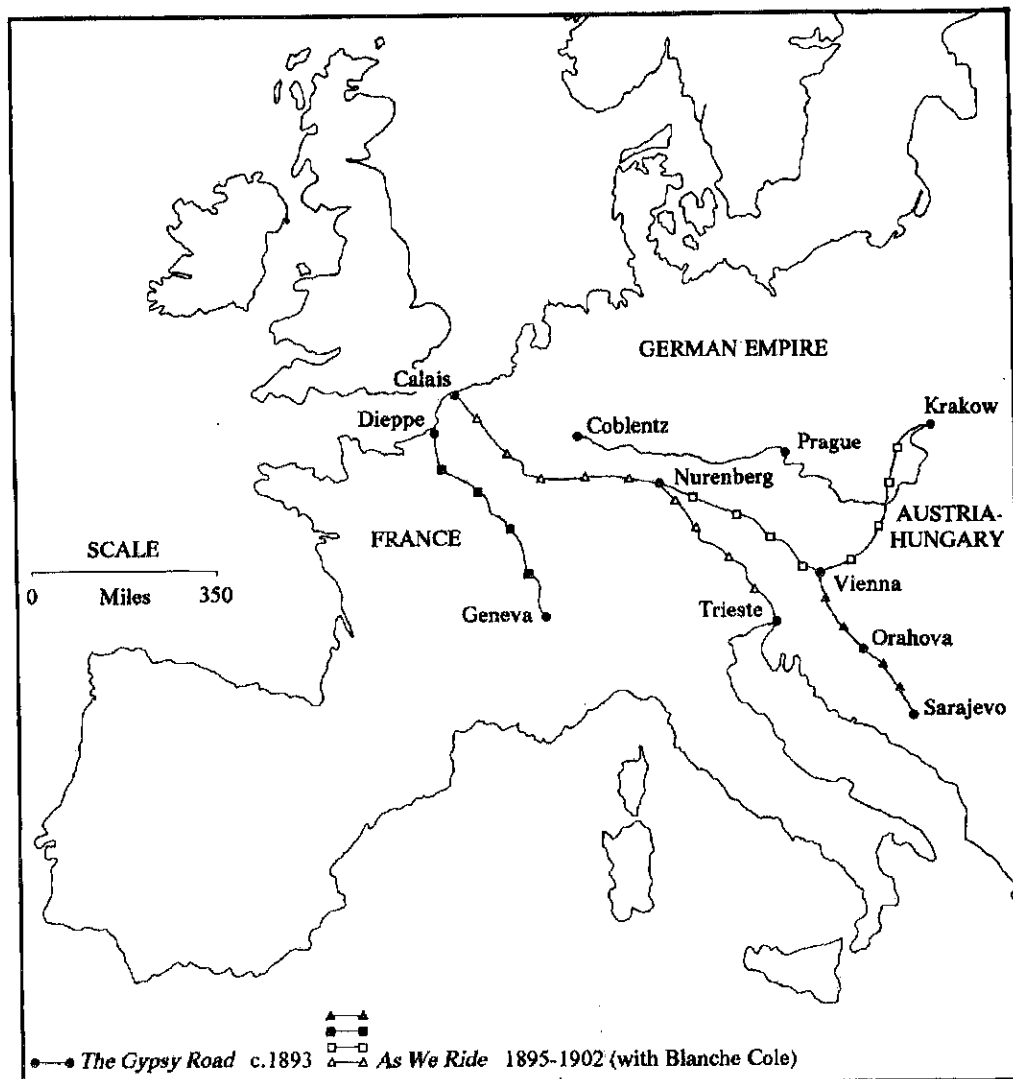


Fig. 5. Some of the routes cycled by Grenville Cole in Europe.

smiting the solid masses with the hammer, and seeing the lustrous flinty chips go skimming across the sunburnt grass' (Cole 1894c, p. 131). In Bohemia, Cole was in his element—wonderful rocks and wonderful cycling. Near Karlsbad they visited the volcanic cone of the Schladnigberg (Fig. 6) and traversed the deposits of Oligocene and Miocene brown coal near Dux, noting that some seams had been burning for at least 5 years and could not be extinguished, before passing out of Bohemia and into Bavaria.

By now their journey was nearing its end, and Cole having seen the volcanic deposits of

Hungary could relax somewhat. He drank schnapps in a tavern in Horgenau, having been recommended to do so on medical advice by some of the elderly men of the village. He declared that his 'union with this simple country life seemed complete' (Cole 1894c, p. 159). However, not much further down the road in the village of Werdorf the journey nearly came to an abrupt end. Having parked their machines, Cole and Butler were relaxing when the tricycle started to freewheel downhill. It collided with a low wall, somersaulted twice and landed in a cabbage patch. The axle was bent and it seemed that the tricycle would have to be brought

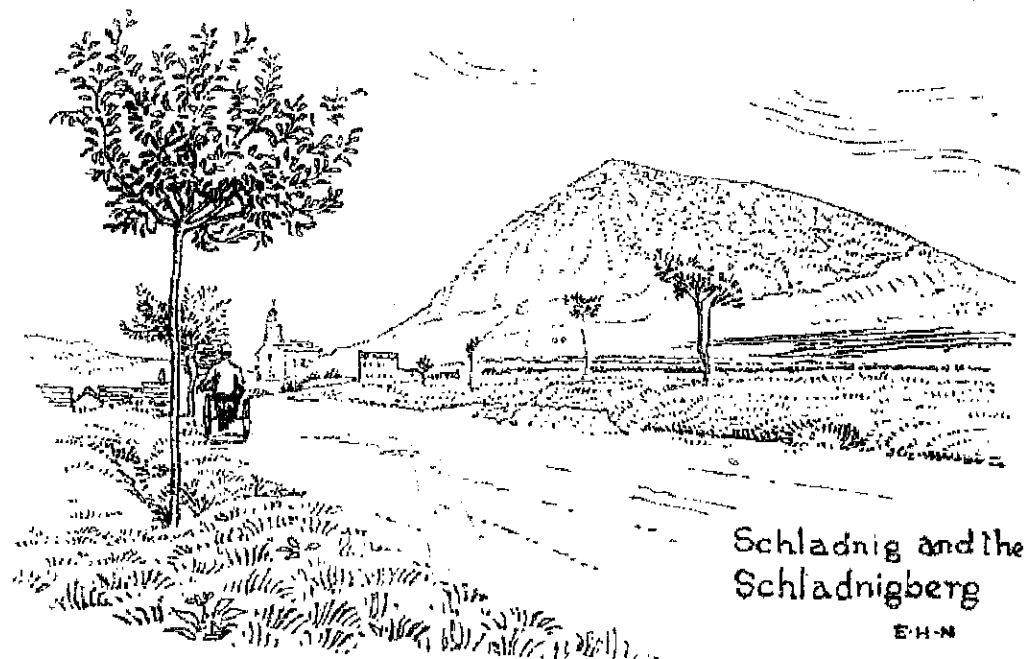


Fig. 6. Cole tricycling past the volcanic cone of the Schladnigberg, near Schladnig, Germany (from *The Gypsy Road*, p. 137. Drawing by Edmund H. New from a photograph by G. W. Butler).

to Wetzler⁹ to be repaired. Fortunately the local blacksmith, aided by Cole and Butler managed to take the wheel bearings apart, straighten the central axle and reassemble the mechanism. During this operation the forge was visited by a man who wished to have his horse reshod. The blacksmith dismissed him, telling him that he now ran a *Velocipedenfabrik!* The wheels ran smoothly afterwards 'and were good for another thousand miles' (Cole 1894c, p. 161).

Finally the pair of cyclists reached Coblenz and Cole likened them to Knights-Errant (Cole 1894c, p. 166); this comparison is a theme that crops up every so often in his writings. His book *The Gypsy Road* is important as it is one of the earliest travelogues of a bicycling trip and it gives an insight into eastern European lifestyles of the period.

As We Ride

In 1902, Blanche and Grenville Cole published a slim book of essays entitled *As We Ride* (Cole & Cole 1902), which gives accounts of a number of their trips through France, Germany, Poland and the Balkans. This volume, now very rare, was published for the benefit of the Royal City of Dublin

hospital and it provides a glimpse of pre-First World War Europe.

In addition to containing geological insights, the essays are generally observations of the social interactions of local inhabitants and the towns through which the couple passed. One senses that Grenville had moved in his mind from hard rock geology to focus more on geomorphology. Indeed many of his publications from this period relate to the subject and its expression in Europe and to the interactions of man and his landscape (Cole 1912a, b).

Of the eight essays, half were written by Grenville and half by Blanche. She certainly did not mince her words. Writing about a visit to the Russian border town of Mlawa in the aptly-titled piece '*Defeat*' she says of the landlady of the only hotel in the town:

She was villainously unclean, and so vacant besides that I wondered whether she were deaf, or idiotic, or both. But the length of her bill next morning in proportion to the nature of our entertainment settled this point; ... she was by no means idiotic—far from it. (B. Cole in Cole & Cole 1902, pp. 100–101).

Rather than continue into Russia the couple retrieved their baggage and returned to Warsaw on the first available train. In *Son of Mars* she pins her political leanings to the mast: 'War is an

undesirable occupation and seldom profitable; but if one must fight, please give me the French to fight with, and let the Germans fight someone else' (B. Cole in Cole & Cole 1902, p. 77). Twelve years later her sentiments counted for little.

Some of these journeys inspired Grenville to write poetry: *The Lost City* published in 1911 is his only piece of published work of this genre, and it recalls the history and evolution of a Templar hospice in the Causse de Larzac in Aveyron in SE France (Cole 1911a). The Coles were clearly taken with the Balkans which they visited on perhaps two occasions. Orahova, a small village now in Bosnia-Herzegovina, provided them with the title of a chapter in their book, but also and more significantly the name of their house in the fashionable district of Carrickmines in south County Dublin which they had purchased in 1902. The house is still standing and was renamed *Glen-heather* by a subsequent owner.

A number of these excursions were recalled later by Cole in public lectures, including that on '*The Fringe of the Balkans*' delivered at the Royal Institution in London on Monday 8 February 1904.¹⁰ Like *The Gypsy Road, As We Ride* is a fascinating commentary on a period long gone—and a reminder of the remarkable energy and close bond of Cole and his wife.

Travels in Ireland

General excursions

In 1884 Cole paid a visit to Ireland, but other than knowing it was to examine the geology of the island,¹¹ and that it was one of first excursions on his Humber-Beeston tricycle, nothing is known of the localities that he visited. Soon after his arrival in Dublin in 1890 on his appointment to the Royal College of Science, Cole rapidly set out to reacquire himself with the geology of Ireland and did so largely by bicycle. In 1892, just two years after his arrival in Ireland, he penned a series of illustrated articles on the geology and scenery of Dublin that appeared in *The Irish Naturalist* (Cole 1892a). He was then commissioned by the owners of the North Eastern Railway in 1895, to write a similar booklet outlining the geology and scenery as seen from their railway carriages. This booklet, to accompany the photographs of the Belfast photographer Robert John Welch (1859–1936),¹² was thus the first of its kind in Ireland (Cole 1895b). To satisfy his fascination with volcanic rocks, he sought out intrusions of rhyolite and headed north to NE Antrim (Cole 1896). He then examined the volcanic mass of Slieve Gallion

(Cole 1897). Later he carried out research on the Dalradian metamorphic belt in Donegal, produced accounts of the Donegal granite and its orbicular structures (Cole 1916) [now sadly damaged by coring] and reports on the intrusions of Tyrone and Londonderry. Later work embraced geomorphology, although he continued to write on igneous and petrological topics. One of the most important papers of his later years was that which described the course of the River Liffey, the river that bisects the centre of Dublin (Cole 1912c). He also put his bicycle to patriotic use: it has been reported that throughout the 1914–1918 war he rode the streets of Dublin as an army dispatch rider (Herries Davies 1995).

Leading student field excursions

Every year between 1903 and 1908 Cole took a group of his second-year agricultural students (or 'scholars' as he called them) on a week-long trip around Ireland to study geology and agricultural botany. This excursion was often held in the month of May and much of the travel was undertaken by bicycle or by train. These excursions first started in 1903 following the sanction of the scheme and agreement to fund it was given on 16 April by J. D. Daly of the Department of Agriculture and Technical Instruction, a Government office responsible for the College.¹³ The cost of the first trip, which included hotels and train travel, was £5/9/11 each (approximately £340 today). It did not include the price of lunch, which was taken in the field, and which each person in the party was expected to provide for himself.

Cole expected his students to cope with the rigours of cycling field trips. As can be seen from the attractive excursion booklets that were provided for the trips, they were quite strenuous. Booklets were produced for the 1903, 1904, 1905, 1906 and 1908 trips and are similar in style, being approximately 12 pages long and A5 in size.¹⁴ They were mass-produced on a copying machine in black, blue or purple ink and were illustrated with geological cross-sections drawn by Cole and with pasted-in portions of maps cut from the recently reissued *Murray's Handbook for Ireland* (Cooke 1902).¹⁵ These booklets documented the routes to be covered and the features to be examined on the trips (Fig. 7).

Taking the 1903 trip as a typical example, we find that on 18 May, the group met at Broadstone Railway Station in Dublin at 6.45 am. Following departure of the train at 7.00 am they took breakfast in the 2nd class car. Five and a half hours and approximately 140 miles later, the party disembarked at the small town of Recess west of Galway having crossed over the Central Plain of

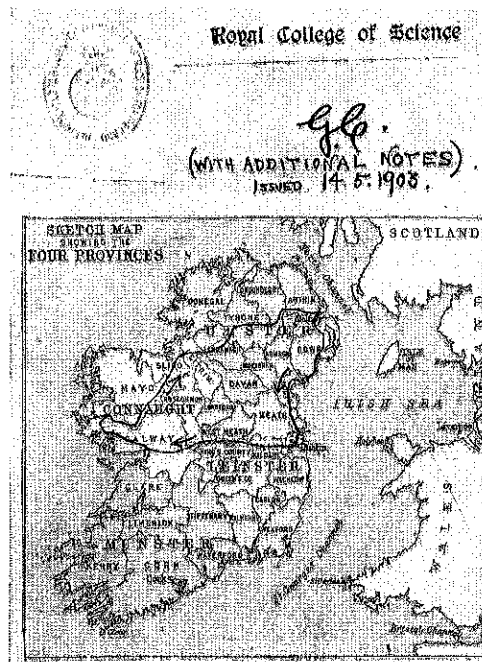


Fig. 7. The route of Cole's student geological tour around Ireland (1903) (from original booklet in the Department of Geology, University College, Dublin).

Ireland. Rather than gaze idly out of the window the students were expected to take notes on the features that they saw. From Recess, they bicycled 17 miles to Leenane where they examined Dalradian rocks and the vegetation. The next morning, they cycled 30 miles over the Silurian conglomerates and silts and Carboniferous rocks of the Mayo district. On 20 May, an early morning train carried the group northeastwards and, following a break from rail travel during which they cycled 21 miles and examined geological and botanical features of interest, they ended up in the town of Omagh. The next day they first visited Pomeroy which had yielded important Silurian fossils first described by Joseph Ellison Portlock (1794–1864) in his monumental volume on the geology of Londonderry (Portlock 1843; Tunnicliff 1980). After a 26-mile cycle over old gneissic terrain and undulating eskers, they passed Slieve Gallion and by evening had almost reached the edge of the Antrim Plateau, which geologically comprises a series of Tertiary basaltic flows. The next day, following their usual early morning rail departure, they reached Kilroot and visited an underground mine from which Triassic salt was being exploited.¹⁶ This was followed by another 21-mile cycle into Belfast via the overlying basalt sequences exposed at Cave Hill having also examined *en route* the Triassic and Cretaceous

sediments protected beneath the younger basalt. On the final day of this first excursion, 23 May, the students and Cole left Newcastle, County Down at 8.00 am and by 9.20 am had already climbed Slieve Donard, a nearby mountain. They then cycled to the small fishing port of Greencastle, loaded their bicycles on to a ferry and sailed across Carlingford Lough to Greenore. From there they took a train to Dublin and arrived in the capital at 9.10 pm.

In 1904, Cole's party of 2 staff members and twelve scholars visited Counties Tipperary and Limerick in Munster before travelling through western and northern Ireland. The following year the group had to cycle to Louisburg and climb Croagh Patrick in County Mayo (Fig. 8), before heading to the SE and the Knockmealdown Mountains in County Waterford. The cost per student for the 1905 trip was £6/7/5 excluding lunches and miscellaneous fees. The following year, in 1906, the agricultural students were joined by a number of third year natural science teachers in training and they travelled through Ireland in a double loop centred on Dublin. Following his return Cole received a letter from T. S. Gill of the sanctioning body in which he was praised for the success of the tour:

I am glad to think that the tour was worked so satisfactorily and economically. The little hand-book is very attractive, even to a scientific ignoramus. I congratulate you and your fellow-teachers on the success of this piece of educational work, and I hope the students appreciate the great advantages which they are receiving at your hands.¹⁷

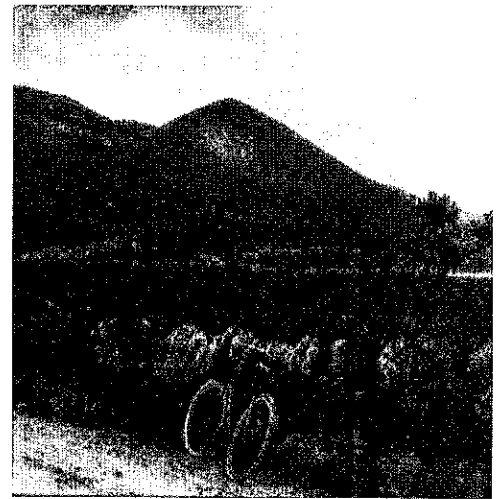


Fig. 8. Cole's 'Roadster' bicycle leaning against a dry stone wall next to a blackthorn tree, with the holy mountain of Croagh Patrick, County Mayo, western Ireland in the background. Note the height of the saddle: it is unusually low to accommodate Cole who was approximately 5 feet tall (from Cole 1922).

In 1907 he took his students to Tipperary again and then to see the sections in the basalt and older Mesozoic rocks in NE Ireland. He was unable to get maps for his booklet and so produced a series of handouts copied onto foolscap paper.

On 16 January 1908 he received a letter from Professor Campbell, Dean of the College, stating that the Department of Agriculture and Technical Instruction had informed him that no money would be made available to fund the field trips and that 'unless the Treasury pay ... these excursions are at an end'.¹⁸ Cole pleaded his case to continue the excursions and even offered to use £10 from his laboratory budget to subsidize the excursions. He received permission to spend no more than £3/10/0 per head,¹⁹ and he managed to run a 6-day excursion in March of that year. However, funding was not forthcoming the following year and the 'long excursion' disappeared from the curriculum, much to his disappointment. This must have been a serious blow to Cole, particularly as he placed huge emphasis on the educational merits of fieldwork.

Cycling and its influence on Cole's research

Cole's early petrological work often depended on materials collected during his cycling trips. By 1897 the thrust of his work altered as he began to document the importance of geological structure on the geographical landscape and he contributed short articles on the geological/landscape theme to *Nature* and *Knowledge* (Cole 1898a–f). He accompanied William Morris Davis (1850–1934) the American geomorphologist on a European tour in 1911 (Davis 1912). Davis, it must be said, preferred train travel to pedal power, this is hardly surprising given the expanse of the North American continent. Cole summed up his thoughts in several later books: *The Growth of Europe* (1914) and *Ireland the Outpost* (1919): 'The study of its [Europe] fundamental structure in relation to the wayward actions of its overlords is for most of us the very keystone of geography' (Cole 1919). He continued this theme in his addresses to the Geographical Societies of Britain and Ireland (he was President of both in 1919) in which he stressed the importance that geography should be introduced as a university subject reiterating again the importance of geology on human distribution (Cole 1921a, b; Herries Davies 1977).

Conclusion

Cole's scientific legacy lies in the pages of his published research output on many topics, but perhaps, of most significance on the volcanic rocks of

Europe and on the foundations of its landscape. However, he also provided important social documentaries that are perhaps now of greater interest given the political changes in, and increasing awareness of Eastern Europe at the present time. His two travelogues give a valuable insight into a bygone period when the area was less turbulent.

Although Cole finally had to give up cycling late in life, due to increasing disability caused by arthritis, he never lost his love for it. In *Who's Who* for 1924 he added one poignant word to his usual entry to this annual listing of persons of influence: 'Recreation: formerly cycling especially as a means of travel' (Cole 1924, p. 581). Sitting in Orahova in Carrickmines in Dublin, gazing at the large wall map, he would have retraced his peregrinations across Europe and North Africa. In the Epilogue to *As We Ride* he wrote: 'Up and down, through our own Atlantic isles, or across the untracked steppes of newer lands, we ride from dark to dawn, part in memory, part perhaps in dream ...' (G. A. J. Cole in Cole & Cole 1902, p. 107).

I am most grateful to all my colleagues and friends who have aided this study: H. Torrens provided information about S. S. Buckman's cycling obsession while E. Robinson documented the role of cycling in some early excursions of the Geologists' Association. P. Kennan gave me access to the Cole-related documents held in University College, Dublin without which this study would not have been possible. I thank my wife Vanessa, who has had to 'live' with 'the cycling geologist' for nearly two decades, for her understanding and patience. This paper was completed in the leafy surroundings of Dickinson College, Carlisle, Pennsylvania during Autumn/Fall 2004. I thank M. Key and his family for their kind hospitality extended to my family during this period.

Notes

¹Dedication in Cole & Cole (1902).

²*Mason & Payne's Cycling Map of the British Isles with Parts of France, Belgium and Holland*. Scale c. 1 : 1 584 000. London (1888), 686 × 573 mm. A series of such maps was produced by George Washington Bacon and Co., London between 1885 and 1923 and included *Bacon's Cycling Road Map: Ireland*. Scale 1 : 253 440. London (1900). It is probable that Cole owned such maps.

³In 1894 he published a short paper entitled 'Geologists at the Luncheon Table' (Cole 1894a), about a series of marble topped tables that he and six other scientists had presented to two ladies, the Misses Gardiner. These ladies ran the *Farm Produce Depot and Refreshment Rooms* at 1–2 South Leinster Street, which was the location for their important scientific debate. The present location of the tables is sadly unknown.

⁴This quarter-inch-to-the-mile map measures approximately 2 m by 1.5 m. It is a linen-backed map and has been

divided into small sections that could be folded which allowed it to be carried easily while in transit. It was recovered in 1999 from a black plastic bag found in an attic in the Museum Building, Trinity College, Dublin. The section containing Belfast and NE Ireland is missing. The map is now in the collections of the Geological Museum, Trinity College, Dublin.

⁵I was told of this by a member of the Bewley family who lived in *Orahova* when a child. After Vernon Cole sold the house, the new owners kept the map in an outside shed before it was discarded.

⁶*The Times*, Saturday, 12 May 1894, page 8, column C.

⁷During this journey Cole used *Bradshaw's Map of Europe*; Bradshaw was the publisher of a number of highly popular maps designed with cyclists in mind.

⁸Beudant undertook his visit to Hungary at the behest of the French Government and published an account of the trip and his findings in four volumes as *Voyage minéralogique et géologique, en Hongrie, pendant l'année 1818. Relation historique 1822*. Verdrière, Paris (1822). He is noteworthy for having described the mineral species including azurite, erinite, klaprothite and smithsonite.

⁹Wetzler was a centre for high-grade precision engineering. Leitz petrological microscopes and other optical instruments used by Cole and many other geologists of the time were and continue to be manufactured in the town.

¹⁰*The Times*, Saturday, 30 January 1904, page 14, column A.

¹¹Anon., 'Obituary. Professor Cole. Geologist and Writer', *The Times*, Tuesday, 22 April 1924, page 18, column E.

¹²Robert Welch was the foremost natural history photographer of his time in Ireland and his images illustrated many scientific papers including those authored by himself. He was an excellent conchologist. He was commissioned to photograph the Titanic and its sister ships while they were being built in Belfast, where he had his studio (Evans & Turner 1977).

¹³This letter is attached to Cole's copy of the 1903 excursion booklet (Department of Geology, University College, Dublin).

¹⁴Cole's copies and associated correspondence are in the Department of Geology, University College, Dublin.

¹⁵Cole clipped the maps out of Cooke's (1902) *Murray's Handbook for Ireland*. Originally published by John Murray, London, this was the first edition to be published by Edward Stanford. When planning the first excursion, Cole wrote to Stanford of 12-14 Long Acre, London, the well-known publisher of geological and other maps, asking him to furnish unbound sheets of these maps. Stanford's response dated 21 April 1903 indicated that he had only printed enough sheets for the binding of the volume and that no additional copies were available at that time. A subsequent postcard from Stanford to Cole, dated 23 June 1903 said that he would bear this request in mind should a further printing of the Atlas be needed. (This correspondence is attached to Cole's copy of the 1903 excursion booklet in Department of Geology, University College, Dublin).

¹⁶Triassic salt is still mined from underground at Kilroot and is mainly used in industry and by local authorities to grit the roads after a snowfall or heavy frost.

¹⁷Letter to Cole, dated 14 June 1906 (attached to Cole's copy of the 1906 excursion booklet in Department of Geology, University College, Dublin).

¹⁸Letter to Cole, dated 16 January 1908 (attached to Cole's copy of the 1908 excursion booklet in Department of Geology, University College, Dublin).

¹⁹A copy of Cole's reply to the letter of 16 January 1908 is given on the reverse side of the sheet of paper. Sanction that he may proceed with the trip, but under financial constraint, came on 24 February 1908 in an almost unreadable letter penned by a civil servant or College administrator (this attached to Cole's copy of the 1908 excursion booklet in Department of Geology, University College, Dublin).

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