

A PRINCE AMONGST AMATEURS

H. H. (ARNOLD-) Bemrose, 1857-1939

by

G. Miller

Every student of the Derbyshire igneous rocks is familiar with- and indebted to the classic papers which H.H. Arnold-Bemrose read to the Geological Society of London, 1894 and 1907. Not many, however, know that the author of them was a Derby businessman who became an amateur geologist in his mid-twenties, gained the respect of some of the greatest professionals of his day, and with their help turned himself into a first-rate petrologist and a leading authority on his own field of study.

Henry Howe Bemrose was born in Derby on March 13th, 1857 - the first child (and only son) of Henry Howe and Charlotte Bemrose. His father and his uncle, William were partners in the flourishing printing and publishing business founded by William Bemrose senior in 1826. From preparatory school at Spondon Henry Howe junior went to Denbigh Grammar School to acquire amongst other things, an affection for North Wales that was to last all his life. In 1874, at the age of 17, he went on a three-week walking tour in Switzerland with a remarkable man, the Reverend John Magens Mello, M.A., F.G.S., the Rector of St Thomas's church at New Brampton, near Chesterfield.

Mello had once been curate at All Saints, Derby, and must there have made the acquaintance of the Bemrose family. Hearty, vigorous (he continued even in old age, to go to camp as Chaplain to the Volunteers), full of good humour (he once wrote a comic history of England for his daughters). Mello was already interested in both geology and archaeology in 1874. His little 'Handbook to the Geology of Derbyshire' appeared around 1866, and a revised version ("respectfully dedicated to His Grace The Duke of Devonshire") was published by Bemrose & Sons in 1873. Two years later he was to make the archaeological discoveries at Creswell Crags in Nottinghamshire with which his name will always be associated.

From the crossing of the Rhone Glacier with Mello the young Bemrose gained an interest in glaciology that endured until his death 65 years later. In 1875 he went up to Clare College, Cambridge, as Foundation Scholar in Mathematics and took his degree in that subject four years later. University reading parties at Criccieth and family holidays at Fairbourne strengthened his love of the North Wales mountains (& Cader Idris in particular), and on his doctor's advice he became a dedicated walker. After leaving Cambridge he joined the family firm (where his first work was to introduce a proper system of double-entry book-keeping and accounting), he was initiated into the Tyrian Lodge of the Freemasons, and settled at Lonsdale Place in Derby with his parents.

Apprenticeship.

In 1880 Henry Howe Bemrose junior became Honorary Secretary to the Derby branch of the Cambridge Society for the Extension of University Teaching - a step that was to change his life in several ways. The Derby branch had been launched seven years earlier and in 1874 its syllabus had included a series of lectures on 'Physical Geography and Geology' given by Jethro Justinian Harris Teall. Teall was the posthumous son of a modest landowner in Oxfordshire. Some eight years older than Bemrose, he went up to St John's College, Cambridge in 1869, and was then persuaded to forsake Mathematics for Natural Science by his tutor, Professor T.G. Bonney. Teall took his degree (and became a Fellow of the Geological Society for London) in 1873, was made a Fellow of St John's two years later, but then devoted himself to University Extension teaching at several centres and to the petrological research which was to make him famous.

The Derby branch suspended its activities between 1875 and 1880, but when it resumed Teall returned to lecture on 'The Origin of the Rocks and Scenery of the British Isles'. The young Bemrose certainly attended these lectures - and probably Teall's further series in 1881 and 1882. Moreover, his connection with the Derby branch was to bring him a great deal more than an interest in geology, for amongst his fellow students was a Miss Ellen Hyde, daughter of the late Reverend John Hyde of Derby and Manchester, whom he was to marry nearly ten years later.

Mercian Geologist, vol. 9, no. 1, 1983
pp. 65-74, plate 9.

In 1882 he took his M.A. at Cambridge - and with a sturdy independence of mind assumed the name of Henry Howe Arnold-Bemrose to distinguish himself from his father and so avoid the confusion of invoices and letters between father and son living in the same house. His admiration for Arnold of Rugby explains the choice of name (and perhaps his life-long preference for a cold bath before breakfast!). A year later he attended (and spoke at) a conference in Cambridge on the problems of the Extension scheme. Photography was being used at Bemrose's works in Derby from 1884 onwards, and Arnold-Bemrose was interested and involved in the process (photographs of the Tideswell Dale marble quarry were taken by him as early as the winter of 1885).

It was in that year that persuaded by Teall, he began (in his own words) "to take an interest in the igneous rocks of Derbyshire and to work out their structure by the modern method of examination of thin slices under the microscope". Teall encouraged and advised him, must have taught him the basic techniques, and lent him specimens for study (of iddingsite, for example, and Eycott Hill lavas). Arnold-Bemrose may indeed have been involved with Teall in another enterprise. The latter's 'British Petrography' started appearing in monthly parts in February 1886, but it came to a halt with the failure of the publishers. Teall was compelled, as he wrote, "to take the work into his own hands" to secure completion, and it ultimately appeared in one volume in 1888 - published by Dulau and Sons of London, but printed by Bemrose and Sons of London and Derby. It seems probable that Arnold-Bemrose was personally involved in the salvaging of this classic book, and he is also believed to have done much of the colour photography of its thin section drawings himself.

In December 1886 Arnold-Bemrose was elected a Fellow of the Geological Society of London, being proposed by Teall, Archibald Geikie, J.E. Marr and others. He attended meetings of the Society, read widely, began to collect specimens in the field (an erratic from Kedleston in addition to igneous rocks). In 1889 he bought his own Dick microscope from James Swift & Son in London (at a total cost with quartz wedge and micrometer, of £26-8 shillings). Thin sections were cut for him by a Gottingen firm in the main, with some by a Derby concern.

1890 proved to be a doubly important year for Arnold-Bemrose. First Ellen (Nellie) Hyde became his wife - indeed a true 'consort battleship' in his life and work - and they went to live at 56 Friargate, Derby. Secondly he joined the Derbyshire Archaeological and Natural History Society which already included his father and uncle amongst its members. It was to the Natural History Section of this body that on April 15th he read his first paper "Notes on the Geology of Derbyshire". In it he reviewed work-in-progress within the county - by, for instance, the archaeologists-cum-geologists (including Mello, and John Ward of Derby at Rains Cave, Longcliffe); by Sorby on the Millstone Grit; by R.M. Deeley (a Derby locomotive engineer and distant relation of Arnold-Bemrose) on the glacial drifts. He touched on the Carboniferous Limestone and the problematical Newhaven clay deposits; briefly referred to his own thin-section studies of the 'toadstones' ("I hope next year to have a paper ready on the lava and beds of fragmental rocks"); and ended with a plea for more photography of temporary rock sections (especially those on the two new railways, Buxton to Ashbourne and Dore to Chinley).

In 1891 the family firm was incorporated as Bemrose and Sons Ltd - Directors Henry Howe Bemrose, William Bemrose, H.H. Arnold-Bemrose, and William Wright Bemrose (William's eldest son). Two years later Arnold-Bemrose's first son, Karl, was born at Derby, and in the same year he contributed a long article on the Derby Company of Mercers to the Journal of the Derbyshire Archaeological and Natural History Society. Despite all the calls of business and family life, he worked away steadily at his field and petrological study of the 'toadstones'. Here he was breaking largely virgin ground. The Geological Survey's one-inch maps (revised in 1867 by Green and Dakyns) covered most of the relevant exposures with a fair degree of accuracy. But apart from some errors of detail, they simply showed 'toadstone' without distinguishing between different lava flows, pyroclastic and intrusive rocks.

The second edition of the accompanying Survey Memoir ('North Derbyshire' by Green, Foster, le Neve and Dakyns, published in 1887) improved on the maps but was still little more than a sketch. From the study of a few important sections and the observations of earlier geologists (John Alsop and J.B. Jukes, for example), the Memoir concluded that there were two main flows of 'dolerite' (with a third in places; that they were contemporaneous with the limestones; and that the 'toadstones' ranged from a vesicular lava to a bedded ash, even a coarse agglomerate. As to detailed petrological studies, these were limited to thin-sections of much altered lavas from the Matlock area in Samuel Allport's 1874 paper to the Geological Society of London, together with Teall's description of the Tideswell Dale dolerite and the Cave Dale basalt in 'British Petrography'.

To fill in this skeleton outline of the Derbyshire igneous rocks Arnold-Bemrose set off most Saturday mornings - calling at the works first and then catching a train to one of the stations on the invaluable Derby to Manchester line. From railhead he clearly had to walk considerable distances at times before returning to Derby in the evening. Confirmed pipe smoker, moderate drinker (a pint of ale at the Anglers Rest Inn in Millers Dale was a regular routine), he tramped the hills and dales

in all weathers and almost always in shorts (he even wore them when dining in hall at Clare in Scout uniform!).

In addition he clearly read a good deal of geological literature and made full notes on his studies. One of his 'Daybooks' (or notebooks) for 1894 still survives, with its many references to British, French, Belgian, German, American and Australian sources. His ability to read French and German was a considerable help, and as one entry shows, he would even tackle a German paper when travelling back in the train from London. Most of his reading, however, seems to have been directed towards current problems in his own studies - for instance, sedimentary dykes, siliceous limestones, quartzites, olivine nodules in basalts.

By the end of 1893 - two years later than he had hoped - Arnold-Bemrose must have finished his paper "on the microscopical structure of the Carboniferous dolerites and tuffs of Derbyshire", and heard of its acceptance by the Geological Society of London. Before he could read it, however, he learned that Sir Archibald Geikie himself proposed to visit Derbyshire to gather material for his book on 'The Ancient Volcanoes of Great Britain' (which was to be published in 1897). Director-General of the Geological Survey since 1882, knighted in 1891, Geikie was an ebullient and controversial geological giant of his day. Arnold-Bemrose at once invited him to stay at his Derby home and offered to conduct him over the ground. In due course (probably in April 1894) Geikie arrived and together they undertook what Sir Archibald himself described as a week's "scamper" - or more decorously, "rapid traverse" - through Derbyshire. By train, horse and trap, and on foot (with one night spent at Grangemill), they visited Castleton and Peak Forest, Millers Dale, Litton, Tideswell Dale, Bonsall, Grange Mill, Hopton, and Kniveton. Geikie's main interest lay in identifying possible volcanic vents, but he also looked at the lavas, tuffs and likely sills. To Arnold-Bemrose the tour was of critical importance. Not only did he have Geikie's help in distinguishing the various vents and in locating probable sills at Peak Forest and Tideswell Dale, Geikie actively encouraged him to work out the field relations of the igneous rocks, and at Grange Mill gave him a brief course in geological mapping on the six-inch scale. 'Even Homer nodded', however, and it was always a source of some private amusement to Arnold-Bemrose that in 'The Ancient Volcanoes of Great Britain', Geikie's plan of Grange Mill showed the dolerite dykes incorrectly aligned north-south instead of east-west.

On June 6th, 1894, two papers were read to the Geological Society of London - one by Geikie and Teall "on the banded structure of some Tertiary gabbros in the Isle of Skye", and Arnold-Bemrose's own contribution. In addition to its detailed petrological analyses his paper suggested several amendments to the Geological Survey maps - dropping six localities, adding the Potluck dolerite, and identifying the separate lavas and tuffs at Litton and Tideswell. It was illustrated by Arnold-Bemrose's micro-photographs of thin-sections - the results of his own experiments and the first ever to be published. Geikie was present, and in the discussion referred to his Derbyshire visit and paid warm tribute to the author.

Subsequently Arnold-Bemrose sent a copy of his paper to Bonney who added his own congratulations (but raised doubts about Geikie's identification of the Tideswell Dale sill). Arnold-Bemrose also wrote to Geikie, expressing some fears that his mapping of the area would have to be so lengthy a process that other workers might anticipate him in publication. Geikie's reply was typically breezy and reassuring - "you can practically take your own time in the research" - though he did add a warning that palaeontology must be involved in working out the limestone succession, in order to determine the sequence of lavas. So in November 1894 Arnold-Bemrose began his task of mapping the igneous rocks on the six (and sometimes twenty-five) inch scales - "in my spare time", as he later wrote.

In the same year he published "Notes on Crich Hill" in the Journal of the Derbyshire Archaeological and Natural History Society. Much of his description of the area's limestone, clays and 'toadstone' related to the Wakebridge Mine which he had descended one weekend two years earlier - 420 feet by means of narrow ladders! In 1895 his father, Henry Howe Bemrose, became Conservative Member of Parliament for Derby (he was to be knighted two years later), and in 1896 Arnold-Bemrose's second son, Roderick, was born. In that year the breadth of his interests was illustrated by a paper on "the discovery of mammalian remains in old river gravels of the river Derwent at Allenton, Derbyshire" which he and Deeley read to the Geological Society of London. The latter had already contributed a paper to the Society's proceedings in 1886 on "the Pleistocene succession in the Trent basin", and he was also in touch with (and helped by) Teall. Further evidence of Arnold-Bemrose's widening researches appeared in 1898 with his paper to the Geological Society of London "on a quartz-rock in the Carboniferous Limestone of Derbyshire" - an account of the silicified and quartzose limestones near Bonsall and round Pindale, Castleton. Bonney took part in the discussion, together with Watts and Strahan.

Maturity

1899 was a busy - and splendid - year for the 42 year-old Henry Howe Arnold-Bemrose. It began with his paper to

the Geological Society of London on "the geology of the Ashbourne & Buxton branch of the London and Northwestern railway; Ashbourne to Crake Low" - a full description of the pyroclastics and limestones exposed during the construction of the new railway. Teall spoke in the discussion, with Lamplugh, Hull, Sollas, Watts and Strahan. Two months later Arnold-Bemrose read a second paper to the Society - "on a sill and faulted inlier in Tideswell Dale, Derbyshire" - in which he unravelled the complexities of the igneous sequence in the dale, and acknowledged his own "conversion" in 1894 to Geikie's view that an intrusive sill was present. In June Arnold-Bemrose made yet another contribution to the Society's deliberations in the shape of a petrographical study of agglomerates and tuffs which appeared as an appendix to the paper by Gibson and Wheelton Hind on the volcanics of Congleton Edge, Cheshire.

In the same year Arnold-Bemrose and his wife joined the Geologists' Association (of which Teall was then President), and in July he read "a sketch of the Carboniferous Limestone in Derbyshire" to the Association. The survey - from the Lower Carboniferous to the Pleistocene - was illustrated by his own photographs, and it disclosed that in addition to igneous rocks, he had collected (but not yet examined in detail) a number of thin-sections of Carboniferous limestones. The paper was a 'curtain raiser' to the Association's excursion to Derbyshire from August 2nd to 10th, with its headquarters at Matlock Bath. Arnold-Bemrose and Wheelton Hind were amongst the directors, and the party visited by train and coach a variety of localities round Matlock, then over to Tissington, up to Millers Dale and Tideswell, and onward to Hayfield, Edale, Peak Forest and Castleton.

In addition to mapping the 'toadstones', Arnold-Bemrose began in 1900 a study of the glacial deposits in the northern part of Derbyshire in collaboration with Deeley. In the next five years he collected and photographed specimens from a considerable area - as far as Glossop in the north, the Goyt valley in the West, and southwards to Ashbourne, Derby and Crich. One of his many sources was Bakewell cemetery - the gravedigger was supplied with stamped and addressed postcards on which to communicate news of likely finds during his excavations; and on receipt of these, Arnold-Bemrose would hurry up by train from Derby to collect his specimens at the cemetery!

Caving was one of many interests, and it was on Boxing day 1900 that he was waylaid at Millers Dale station by friends in the Derby-based Kyndwr Club. Although on his way to spend a few days mapping round Tideswell, he gladly went with them to the Eldon Hole Cavern near Castleton to enjoy a two-&-a half minute descent in a bosun's chair. A few months later he undertook with the Club a similar descent of the Bottomless pit at the Speedwell Mine, Castleton. In 1902 his third son Clive, was born and the family moved to Ash Tree House, Osmaston Road, in Derby. The house was spacious; one room near the front door was fitted up as his study and library; one became his dark room, another housed the long enlarging camera; while a long loft over the stables and coach-house was turned into a museum for his specimens. For many years he not infrequently slept out in the large garden, under a shelter open on two sides.

In September 1902 he spent a fortnight at Little Longstone to continue his mapping, and during the year he was much engaged in a salvage operation at Hoe Grange quarry, Longcliffe, where John Ward of Derby had discovered mammalian remains in the workings. He duly reported his find to Arnold-Bemrose who took immediate and energetic steps to safeguard the deposits, have them dug out scientifically, and transferred to his loft (and ultimately to Derby Museum).

It was through pointing out mistakes in the labelling of specimens at the Museum that he was co-opted on to the Museum and Libraries Committee of Derby Town Council. A Conservative by tradition rather than ideology, he was elected to the Council in 1903 and served it faithfully and with distinction for some 35 years - twice Mayor, Alderman from 1910 onwards, member of the Education Committee for the entire period and its chairman for 15 years. Despite all these new responsibilities he still found time to read the second part of his paper to the Geological Society of London on the Ashbourne to Buxton railway line cuttings - covering the limestones and clay wayboards of the northern section. Amongst the many places he visited during the year was Cop Round, near Peak Forest, in the company of Samuel Moore of Castleton who had written to the 'Geological Magazine' earlier about his discovery of a lava exposure there.

In 1904 his fourth son, John Maxwell, was born; Arnold-Bemrose became a J.P.; wrote a short article - "Geological Notes on Arbor Low" - for the Journal of the Derbyshire Archaeological and Natural History Society (a special issue on the Arbor Low Stone circle); and also contributed two more substantial papers to the Geological Society of London's proceedings. The first - "on some quartzite dykes in the Mountain Limestone near Snelston" - dealt with sedimentary dyke structures; while in the second - "on an ossiferous cavern of Pleistocene age at Hoe Grange, Longcliffe" - he and E.T. Newton described the finds made there in 1902 and 1903. Earlier in the year he and Lapworth had been amongst the directors for the Geologists' Association Whitsuntide excursion to Derbyshire. With its headquarters in Buxton the party visited localities around the town, the dams under construction in the Derwent valley, Wormhill and the Wye valley, Monsal Dale, Ashford and Crich (to study erratics and boulder clay).

The following year - 1905 - brought Arnold-Bemrose the first of several honours for his services to geology - an award from the Wollaston Donation Fund of the Geological Society of London which he received on the day that Teall (now Director of the Geological Survey) was presented with the Wollaston Medal. The first volume of the Victoria County History of Derbyshire was published, containing Arnold-Bemrose's substantial chapter on the geology of the county. In 1906 he became a member of the Council of the Geological Society (serving till 1908, again between 1911 and 1916, and being appointed a Vice-President in 1914). During the winter of 1906-1907 he gladly found time to pilot T.F. Sibly through the Carboniferous Limestone country during the latter's study of its faunal succession in his attempt to apply Vaughan's scheme for South-West England to Derbyshire.

1907 carried him to the apogee of his geological researches - the delivery in August to the Geological Society of London of his definitive paper on "the toadstones of Derbyshire". The audience was a distinguished one with Sir Archibald Geikie (the President) in the chair, and Greenly, Lamplugh, Wedd, Hull and Sibly amongst others present. Twenty-one years of 'sparetime' study in the field and laboratory had gone into the presentation of a paper which at last established a firm and comprehensive framework for the igneous rocks of his native county.

In 1908 a further honour came to him when he was made Doctor of Science by Cambridge University for his scientific contribution (plate 9). Sir Archibald Geikie, too, included his name amongst "those associated with the great petrological revival of the 19th century in Britain", during his Anniversary Address to the Geological Society. Early in September he travelled to Dublin for the 78th meeting of the British Association for the Advancement of Science (of which he had been a member since 1893), and there he read his 'Notes on the microscopical structure of the Derbyshire limestones'. Based upon an examination of some 400 thin slices of both Carboniferous and Permian rocks in the county, the paper described his identification *inter alia* of oolites, foraminifera, sponge spicules and "fossils which have not been previously described and which may be new forms of calcareous algae".

In 1910 there was a further burst of literary activity. In January he published in the 'Geological Magazine' a paper "on olivine-nodules in the basalt of Calton Hill, Derbyshire" - a description of the agglomerate & tuffs exposed by new quarrying, and of the olivine-nodules within the basalt (which he believed to be "segregations from the magma and not inclusions of older rock"). Dr Arnold-Bemrose also contributed a paper on "the Lower Carboniferous rocks of Derbyshire" to 'Geology in the Field', the Jubilee volume of the Geologists' Association. Largely a revision of his 1899 "Sketch", the paper included references to Sibly's recent work, and took account of the new scheme for the classification of the 'Yoredale' rocks in the county. In quite a different vein was the little volume on 'Derbyshire' in the Cambridge County Geography series, compiled with the help of his wife on aspects of Derbyshire history and architecture. He also wrote a chapter in the Reverend J.M. Fletcher's 'Guide to Tideswell' - an action typical of the generosity with which he would always put his specialist knowledge at the disposal of others (whether they were professional or amateur geologists, librarians or museum curators).

In 1911 his father, Sir Henry Bemrose, died (and his mother soon afterwards). In the resulting reorganisation of the board of Bemrose and Sons Ltd, he was appointed Deputy Chairman, with his cousin, William Wright Bemrose, as Chairman. In June he dropped the 'Arnold-' from his name and became Henry Howe Bemrose again. His public work and responsibilities were increased by membership of the Derwent Valley Water Board (he was to be Chairman for 22 years) in an appointment which met both his geological and civic interests. Since becoming Mayor, too, he had given his enthusiastic support to the Scout Movement in Derby, and he became District Commissioner in 1913. Geology, however, was not neglected, and in Easter that year he joined the Geologists' Association excursion to the Lizard (his photograph of the directors, Flett and Hill, still survives). 82 members were present, one of them being bitten by an adder and "considerably inconvenienced for a day or two"!

Before Christmas Dr. Bemrose sprained an ankle and this hampered him somewhat in his preparations for the Geologists' Association summer excursion to Derbyshire in 1914. His co-director, Henry Crunden Sargent of Fritchley, bombarded him with suggestions for the itinerary (together, with petrological queries) during the first months of the year, suggestions to which Dr. Bemrose responded with characteristic tact and firmness! The Association party assembled at the Matlock Bath headquarters on July 21st, and spent nine days exploring the county by train and - an innovation - "covered motor car". Amongst the localities visited were the New Haven and Brassington clay pits, Calton Hill, and the Derwent Valley dams (reconnoitred earlier by Dr. Bemrose in the company of Professor W.G. Fearnside of Sheffield University). On the final Tuesday the party "took tea" at Millers Dale, caught the 4.25 train, had their luggage put on at Matlock Bath, and dispersed south to Derby and London. The date was August 4th - at midnight the British ultimatum to Germany expired and the country was at war.

Interregnum

The first World War imposed great strains upon Dr. Bemrose and it is little wonder that his geological activities were suspended 'for the duration'. For some time he was one of only two Directors remaining in Derby. He acted as Company Secretary for 14 months; supervised the collotype and photographic branches; carried out the photography himself, made the collotype plates with the leading artist, and was responsible for a number of improvements and inventions at the firm's works. In addition to office burdens, his family was grievously affected by the loss of his two sons. Karl Bemrose, the eldest, joined the Sherwood Foresters and was killed on the Somme in 1916. Roderick, the second son, died in hospital in November 1918, after serving with the RFA, being wounded and awarded the Military Cross.

During the early 1920's Dr. Bemrose's time was fully taken up by his business commitments, his public and political activities, and by Scouting (he became County Commissioner in 1922). In 1926 Bemrose and Sons Ltd celebrated its centenary, and to mark the occasion Dr. Bemrose compiled a substantial volume, 'The House of Bemrose, 1826-1926', which must have taken him some time to research and write. His geological expertise and knowledge, however, were always available to be put at the disposal of other workers. Amongst the many he helped was a young Japanese student, R. Ohashi, who came in 1921 to look at Derbyshire's ancient igneous rocks after studying the Recent volcanoes of his native country.

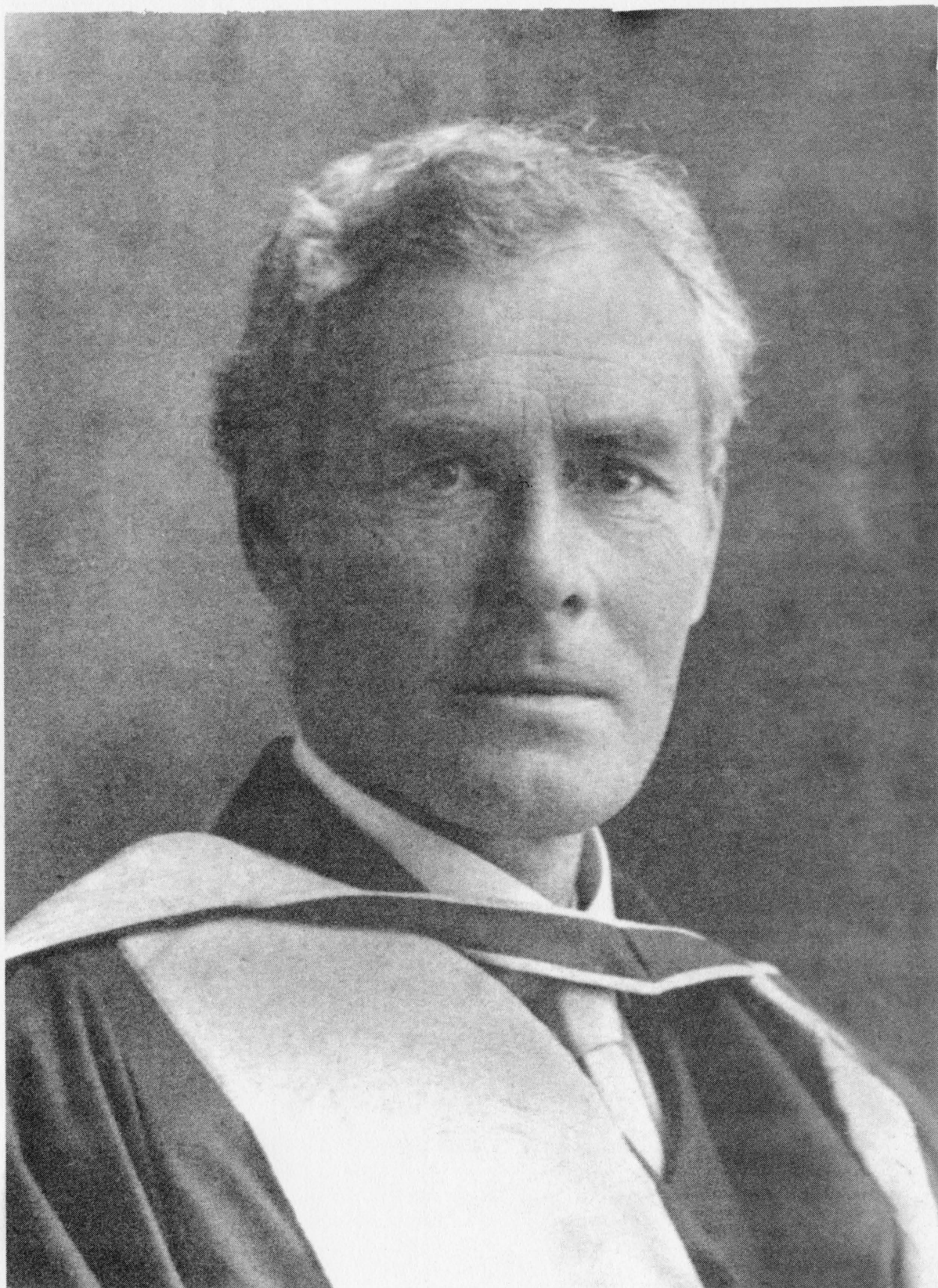
Back in The Field

It was around 1928 that Dr. Bemrose resumed regular weekly field trips - often travelling on the 0945 train from Derby in the company of Philip Speed, a Nottingham University College student whom he had first met through the Scout movement. "Walk with a purpose" was his advice, and together they revisited many of his original localities in the Millers Dale area. He began to take notes on his reading again, sometimes filling empty spaces in his old 'Daybooks' (generous as he was, he always had a rooted aversion to the waste of money and resources). Further specimens were added to his collection of erratics; he contributed by letter to the discussion of S.I. Tomkeieff's paper to the Geological Society of London on "the volcanic complex of Calton Hill" in 1928; and in the following year he took a party from the Yorkshire Geological Society round the Grangemill vents. At Easter in 1930 he joined the Geologists' Association excursion to North Wales. On April 18th he was with the group that ascended Snowdon by the Pyg Track in snow and descended by the Watkin path (in shorts and at the age of 73!); and he was chosen to give the vote of thanks to the Excursion Secretary on behalf of the members.

In 1931 he retired from Bemrose and Sons after 51 years of service, and with more time to spare at last, stepped up his geological pace. Though illness prevented him from attending the Geologists' Association Easter excursion to the county in 1932, he enjoyed a holiday in Skye with his wife that August, looking at the Tertiary igneous rocks. He was about in Derbyshire a good deal - now transported in a chauffeur-driven car - to photograph exposures, look for erratics (he paid several visits to the Goyt valley whilst the new reservoir was under construction) and collect specimens for the South Kensington Geological Museum which opened in 1935. Amongst his finds was an erratic boulder of Eskdale granite which with typical thoughtfulness he had transported from a Derby garden to the school in the city that still bears his name. With Philip Speed, too, he went to the Lake District to see for himself the source rocks of many Derbyshire erratics.

In 1933 the University College, Nottingham (with which he had been associated for many years) invited him to give the 8th Abbott Memorial Lecture, and Dr. Bemrose chose as his subject something certain to appeal to a general (and young) audience - "The Caves in Derbyshire". He and his wife travelled abroad in 1935 for an extended holiday in Egypt and Malta. In response to a request from L. du Garde Peach, Dr. Bemrose wrote six popular articles on the county's igneous rocks for "The Derbyshire Countryside", and these appeared in the magazine between January 1935 and April 1936. Illustrated by photographs old and new, these articles on the lavas, tuffs, necks and sills include his observations on some exposures that were well beneath the ground during the mapping labours of 1894 to 1907.

In 1935 he was disconcerted - perhaps even outraged - to read a letter in the 'Geological Magazine' from a Mr. Jessop of Sheffield, questioning his interpretation of the Potluck dolerite as a sill. He reacted with typical vigour and thoroughness - visiting the area and new trial holes several times, and demolishing his critic with an authoritative reply which appeared in the same publication in 1937. In July of that year the Chief Scout, Lord Baden Powell, stayed with him at Ash Tree House, visiting the Drum Hill Scout Camp and receiving from Dr. Bemrose the lease of the land upon which the Camp was situated. At the end of the month he and his wife went to stay in Dalbeattie, and from there he joined in the Geologist's Association excursion to the Southern Uplands.



In 1938 there were new honours to crown his life. He was made a Freeman of his native Derby; he became Vice-President of the Council of University College, Nottingham; and in February the President of the Geological Society of London, Professor O.T. Jones, presented him with one of the Society's highest awards - the Murchison Medal. In his Ash Tree House study (to which he would retire, thankfully, without his tie!) he continued to work with Philip Speed on the first drafts (with corrections in green ink) of his paper on "Boulders of the Derbyshire drift". Begun as he wrote, in 1897, it contained a mass of information about over 700 glacial erratics collected throughout the county, with notes on their petrology. The final version was submitted after his death to the Editor of the 'Proceedings of the Geologists' Association'; but wartime publication problems prevented its appearance, and unfortunately the paper cannot now be traced.

It was perhaps fitting that at the end of his life, Dr. Bemrose should return to glaciology - that aspect of geology which had first caught his interest when he crossed the Rhone Glacier at 17. The last reference in the revised draft was dated June 20th, 1939, and it read -

"I met Mr. S.T. Nash of Cubley who asked me to call at his house, and see some boulders he got from blue clay in digging a well." At the time, too, he was busy with Philip Speed on detailed plans for a field trip by a party from Abbotsholme School, and as always, he was most anxious that the excursion - to Bonsall and Wirksworth - should go well. But in the event he could neither visit Mr. Nash nor lead the excursion. A stroke intervened, and on July 17th in his 83rd year, Dr. Bemrose died at his home in Derby.

How does his major opus - on the Derbyshire igneous rock - stand today after more than 70 years of further research? The Institute of Geological Sciences staff have suggested alternative interpretations of some features - the dolerite at Low Farm, Bonsall; his New Bridge sill (Miller, 1980); and his vent at Cracknowl, Bakewell, which is now mapped as part of a lava flow, although fragments of agglomerate and tuff are certainly present together with lava debris (Miller, 'Amateur Geologist', forthcoming). He was mistaken - as he unhesitatingly admitted in 1928 - over the origin of the Calton Hill olivine - nodules, and he perhaps missed the spilitic affinities which his co-worker, Sargent, found in some of the Derbyshire basalts and described to the Geological Society of London in 1917. Quarrying operations since 1907 have exposed the Great Rocks Dale dykes, the complexities of Calton Hill and Waterswallows; later exploitation of the Mill Close Mine has shown the presence of additional lava flows in the Matlock area.

These however, are comparatively minor details in Arnold-Bemrose's great scheme, and for an amateur geologist working in his spare time, its construction was a remarkable feat. It is true that he did his major work in an age when professional geologists were thin on the ground, and when the relationships between professionals and amateurs were easier and closer than they often are today. But within the context of so rich a public and private life, his achievement is surely quite outstanding. It endures, and so everyone today who explores the igneous rocks of Derbyshire's hills and dales walks with Henry Howe Arnold-Bemrose, at least in spirit, by his side.

Acknowledgements

My grateful thanks to Mr. E. Clive Bemrose, OBE, and to Mr Philip H. Speed for the loan of original papers and for their patience in answering my many queries.

Bibliography

- | | |
|----------------------|--|
| ALLPORT, S., | 1874. The microscopic structure and composition of British Carboniferous dolerites <i>Q.Jl.geol.Soc.Lond.</i> vol. 30, pp 529-567. |
| ALSOP, J. | 1894. On the toadstones of Derbyshire, <i>Report Brit. Ass. Adv. Sci.</i> |
| ARNOLD-BEMROSE, H.H. | 1891. Notes on the geology of Derbyshire, <i>Jl. Derbys Arch. & Nat. Hist.Soc.</i> vol. XIII, pp. 32-38. |

- ARNOLD-BEMROSE, H.H. 1893. The Derby Company of Mercers. *Jl. Derbys. Arch. & Nat. Hist.Soc.* vol. XV.
- ARNOLD-BEMROSE, H.H. 1894. On the microscopical structure of the Carboniferous dolerites and tuffs of Derbyshire, *Q. Jl.geol.Soc.Lond.* vol. 50, pp. 603-644.
- ARNOLD-BEMROSE, H.H. 1894. Notes on Crich Hill. *Jl. Derbys. Arch. & Nat. Hist.Soc.* vol. XVI. pp. 44-51.
- ARNOLD-BEMROSE, H.H. 1896. The discovery of mammalian remains in old river gravels of the river Derwent near Allenton, Derbyshire. *Q. Jl. geol. Soc. Lond.* vol. 52, pp. 497-500 (P11).
- ARNOLD-BEMROSE, H.H. 1898. On a quartz-rock in the Carboniferous Limestone of Derbyshire. *Q. Jl.geol.Soc.Lond.* vol. 54. pp. 169-183.
- ARNOLD-BEMROSE, H.H. 1899. Geology of the Ashbourne and Buxton branch of the London and North-western railway; Ashbourne to Crake Low. *Q. Jl.geol.Soc.Lond.* vol. 55. pp. 224-238.
- ARNOLD-BEMROSE, H.H. 1899. On a sill and faulted inlier in Tideswell Dale, Derbyshire, *Q.Jl.geol.Soc.Lond.* vol. 55. pp. 239-249.
- ARNOLD-BEMROSE, H.H. 1899. On the petrology of the rocks on Congleton Edge. *Q. Jl.geol.Soc.Lond.* vol. 55. App. I, pp. 556-559 in Gibson, W. and Hind. W. Tuffs & Agglomerates of Congleton Edge.
- ARNOLD-BEMROSE, H.H. 1899. A sketch of the Carboniferous Limestone in Derbyshire. *Proc.Geol.Ass.* vol. 16. pp. 165-221.
- ARNOLD-BEMROSE, H.H. 1903. Geology of the Ashbourne and Buxton branch of the London and North-western railway; Crake Low to Parsley Hay. *Q. Jl.geol.Soc.Lond.*, vol. 59. pp. 337-347.
- ARNOLD-BEMROSE, H.H. 1904. On some quartz dykes in Mountain-Limestone near Snelston, Derbyshire, *Q.Jl.geol.Soc.Lond.* vol. 60, pp.364-371.
- ARNOLD-BEMROSE, H.H. 1904. Geological notes on Arbor Low. *Jl. Derbys Arch. and Nat. Hist. Soc.* vol. XXVI. pp. 78-79.
- ARNOLD-BEMROSE, H.H.*et al.* 1904. Excursion to Buxton and N. Derbyshire, *Proc. Geol. Assoc. Lond.* vol. 18, pp. 419-427.
- ARNOLD-BEMROSE, H.H. 1905. On an ossiferous cavern of Pleistocene age at Hoe Grange quarry, Longcliffe, near Brassington, Derbyshire. *Q. Jl. geol. Soc. Lond.*, vol. 61. pp. 43-63.
- ARNOLD-BEMROSE, H.H. 1905. 'Geology' in the *Victoria County History of Derbyshire*, vol. I.
- ARNOLD-BEMROSE, H.H. 1907. The toadstones of Derbyshire; their field relations and petrography. *Q. Jl. geol. Soc. Lond.*, vol.63. pp. 241-281.
- ARNOLD-BEMROSE, H.H. 1909. Notes on the microscopical structure of the Derbyshire Limestones. *Rept. Brit. Ass, Adv. Sci.* 78th Meeting, Dublin, September, 1908. pp. 269-274.
- ARNOLD-BEMROSE, H.H. 1910. On olivine nodules in the basalt of Calton Hill, Derbyshire, *Geol. Mag.* vol. 57. pp. 1-4.

- ARNOLD-BEMROSE, H.H. 1910. The Lower Carboniferous rocks of Derbyshire. Geol. Ass. Jubilee volume, 'Geology in the Field'. Pt. III, pp. 540-563.
- ARNOLD-BEMROSE, H.H. 1910. 'Derbyshire', Cambridge County Geographies. Camb.Univ.Press.
- ARNOLD-BEMROSE, H.H. 1926. 'The House of Bemrose, 1826-1926'. Derby.
- ARNOLD-BEMROSE, H.H. 1933. 'The Caves in Derbyshire'. 8th Abbott Memorial Lecture, University College, Nottingham.
- ARNOLD-BEMROSE, H.H. 1936. 'The ancient volcanoes in Derbyshire', *The Derbyshire Countryside*. January 17th; April 18th; July 19th; October 20th. Nos. 17-20.
- ARNOLD-BEMROSE, H.H. 1937. 'The ancient volcanoes in Derbyshire'. *The Derbyshire Countryside*. January 21st; April 22nd. Nos. 21 and 22.
- ARNOLD-BEMROSE, H.H. 1937. A glacial track in the Peak District of Derbyshire versus the Potluck Sill, Letter in *Geol. Mag.* vol. 74. p.478.
- DEELEY, R.M., 1886. The Pleistocene succession in the Trent basin. *Q. Jl. geol. Soc. Lond.* vol. 42. pp. 437-480.
- GREEN, A.H., FOSTER, C. le N.
DAKYNS, J.R. 1887. The Geology of the Carboniferous Limestone, Yoredale Rocks and Millstone Grit of North Derbyshire. 2nd edition. *Mem. Geol. Surv. Gt. Br.* xv + 212 pp.
- HACKETT, D., 1976. 'The history of the future - the Bemrose Corporation, 1826-1976'.
- JESSOP, P., 1935. *Glacial track in the Peak District*. Letter in *Geol* vol. 72. p. 96
- JUKES, J.B., 1872. 'The Student's Manual of Geology'. 3rd edition, revised by Sir A. Geikie.
- MELLO, J.M., 1873. 'Handbook to the Geology of Derbyshire'. London and Derby 40 pp.
- MILLER, G.D., 1980. The Case of the disappearing sill, *Amat. Geol.* viii, (1).
- SARGENT, H.C., 1917. On a spilitic facies of Lower Carboniferous lava flows in Derbyshire, *Q. Jl. geol.Soc.Lond.*, vol. 73, pp. 11-25.
- TEALL, J.J.H., 1888. 'British Petrography', London, pp. 209-210.
- TOMKEIEFF, S.I., 1928. The volcanic complex of Calton Hill. *Q. Jl.geol.Soc.Lond.* vol. 85, pp. 703-718.

- GEIKIE, Sir A., 1897. *The Ancient Volcanoes of Great Britain*, vol. 2 pp. 8–22.
- GEIKIE, Sir A., 1899. Derbyshire Excursion, *Proc. Geol. Ass.*, vol. 16.
- GEIKIE, Sir A., 1903. Derbyshire Excursion, *Proc. Geol. Ass.*, vol. 18.
- GEIKIE, Sir A., 1915. Derbyshire Excursion, *Proc. Geol. Ass.*, vol. 26.
- GEIKIE, Sir A., 1938. Awards, *Proc. Geol. Soc. Lond.*, *Q.Jl. geol. Soc. Lond.* vol. 94.
- GEIKIE, Sir A., 1940. Obituary, *Proc. Geol. Ass.* vol. 51.
- GEIKIE, Sir A., 1944. Obituary, *Proc. Geol. Soc. Lond.*, *Q.Jl. geol. Soc. Lond.* vol. 100.