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GCG

THE GEOLOGICAL CURATOR

VOLUME 2 No. 8 1980 Second issue

THE WORST CURATED GEOLOGICAL OBJECT ?!

FRONT COVER

Our cover is inspired by Stephen Pile's best-seller of 1979 - "The book of Heroic Failures", Routledge and Kegan Paul which includes on page 25 the following entry relating to the world of Museums.

THE LEAST ACCURATELY LABELLED MUSEUM EXHIBIT

> A first-class example of inaccurate labelling was discovered in October 1971 in County Durham. The object was exhibited in a South Shields museum as a Roman *sestertius* coin, minted between AD 135 and AD 138. However, Miss Fiona Gordon, aged 9, pointed out that it was, in fact, a plastic token given away free by a soft drinks firm in exchange for bottle labels. The dating was, in her view, almost 2,000 years out.
>
> When challenged to provide evidence, she said: 'I knew because the firm's trademark was printed on the back.'
>
> A spokesman for the Roman Fort museum said: 'The token was designed as a Roman replica. The trouble was that we construed the letter "R" on the coin to mean "Roma". In fact it stood for "Robinsons", the soft drink manufacturers.'

Geology in Museums must offer similar opportunities. Our cover specimen comes from the collections of a well known East Midland museum. The photograph shows one side view of "a" fossil in their collections; the other side bears a stick on label reading "485 HARPOCERAS OPALINUM? [a Jurassic ammonite] DERIVED [FROM] LOWER OOLITE, BOULDER CLAY."

It is in fact a pair of GRYPHAEA which have become entangled in pseudo ammonitic fashion. Doubtless readers will have come across similar Worst Curated Geological objects in their collections and we would be pleased to hear of them.

BACKNUMBERS of most Newsletters are still available at £1.00 each (including postage). Payment should accompany all orders, which should be sent to John Martin, Leicestershire Museums, 96 New Walk, Leicester, LE1 6TD.

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COLLECTIONS INFORMATION TO - Hugh S. Torrens. (Chairman)

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¢ Triceratopic

BIRMINGHAM MUSEUM and Art Gallery Committee decided today to buy the fossilised skull of a triceratops from the American Museum of Natural History for about £700. At present there are only two in Britain, and Birmingham hopes to have the third early next year. The skull, six feet in length, weighs nearly half a ton. It was dug up in Nevada. The triceratops was a mild-mannered, plant-eating dinosaur, looking something like a rhinoceros, although it had three horns and a bony frill to protect its neck. –

In Brum beat the drum from the rooferatops
And trumpet our treasure, the triceratops;
Edgbastodon! Here's something more than a mastodon!
Moseley! A mammal with bony frills plastered on!
A rhino but nicer – a triceratops
Solely subsisting on cereal crops.
Curator! Send parties to Pole or Equator
And nothing you'll find with a charm that is greater;
In Stechford and Shifnal they'll shutter their shops
And stream in to stare at your triceratops,
Tourists from buses, from planes and from ships,
Tricycle tourists with trouseroclips
Will see your museum and clamour in chorus
The Midlands have more than a megalosaurus,
They'll fight for a sight of your triceratops,
You'll have to get more motorcycleocops –
And further we fit you with featherocaps,
How did you diddle the dollarogaps,
The treasurytypes with their stopperostops
On transferable sterling for triceratops?

Preposterous posers will pester posterity
Probing our present prevailing austerity,
Trying to square with the goldreservedrops
Such largesse of lolly for triceratops;
'Perhaps,' they'll opine, 'not in total eclipse
Were men who acquired, with such pocketadips,
A *third* skull for England, now rich to infinity,
Possessing a triceratopian trinity.'

So triple the tipple in claretocups
(Or if you're teetotal, in teaserocups)
Print pressfuls of praise, pulling out all the stops
And pray, sirs, a toast to THE TRICERATOPS.

Paul Jennings.

From Idly Oddly by Paul Jennings
Max Reinhardt London 1959

31. THE REVEREND GEORGE CRABBE (1754 - 1832)

"The Fossil Collection of the Rev. George Crabbe (1754-1832) at Trowbridge"

A note in the Newsletter of the Society for the Bibliography of Natural History drew our attention to the fact that Thomas C. Faulkner of Washington State University was working on the collected letters of the poet Rev. George Crabbe (1754-1832) and wished to know more of his activities in natural history and geology. Dr. Faulkner had visited the basement of the Old Town Hall in Trowbridge in 1974 and was somewhat horrified to find the remains of George Crabbe's fossil collection in the state shown in the photograph below.

Crabbe is normally better known as a botanist but took an early interest in geology and contributed to the descriptions of fossils and minerals from the Vale of Belvoir (in Nichols vol. 1, pt. 1, 1795, pp. cc-cciii) and Barrow on Soar (in Nichols vol. 3, pt. 1, 1800, pp. 82-84). Crabbe was Rector of Muston in the Vale of Belvoir, Leicestershire from 1789-1792 and helped John Nichols with his 4 volume History and Antiquities of Leicestershire in which the above descriptions appear. Crabbe returned to the study of fossils again in 1814 after the death of his mother in October 1813 and his move to Trowbridge (1, p. 225). The collections now at Trowbridge must date from this period onwards.

Crabbe came originally from Suffolk being born in Aldborough. He presented 45 Suffolk fossils to the Bath Literary and Scientific Institution in 1827 (see GCG Newsletter 1 (3), p. 95, 1975). In view of the interest in Crabbe as a geologist it was felt worthwhile to investigate the present state and content of the remaining collections at Trowbridge and Justin Delair has very kindly visited the collections and contributed the following note.

H. S. Torrens

Although an informative biography of the Rev. George Crabbe is available(1), and other general accounts of his career have been published(2), his geological interests have received comparatively little attention. Indeed, these have for long been overshadowed by his celebrated literary accomplishments and by his botanical pursuits.

Nonetheless, Crabbe was a keen student of Geology, especially after he moved to Trowbridge in 1814. From that date until his demise in 1832 he collected many minerals and fossils, although not all the specimens were local to Trowbridge. Some of his minerals, for example, came from Torquay, while some of his Eocene gastropods must have been collected in the Hampshire basin and not improbably on the Hampshire coast. Whether Crabbe personally collected at these more distant localities or obtained such material from other contemporaries is, however, uncertain.

After his death, Crabbe's collections were acquired by Major Thomas Clarke(3), who lent them to the Wiltshire Archaeological and Natural History Society for a temporary display in Trowbridge. Later they were transferred to the Town Hall there, and then to their present home - the Civic Hall - among the borough collections which fall under the jurisdiction of Trowbridge council. Lacking the attention of a resident geologist, Crabbe's specimens were initially somewhat neglected at Trowbridge, but were later sorted into groups and boxed. Latterly, they formed part of a public exhibition in which Crabbe's career and activities were featured. At some stage an attempt has been made to label some of the fossils, although in several instances the identifications are erroneous.

In order that the extent of Crabbe's palaeontological endeavours may be better appreciated, the following list briefly summarizes the kind of fossils that he collected. Unfortunately, the majority of the specimens lack labels and one can only infer possible horizons and localities. Such inferences as seem reasonable appear below*. A more detailed study of the specimens would probably enable these to be augmented.

One box of Coal Measure plants (Carboniferous).
One box of Palaeozoic corals.
Two boxes of various Mesozoic corals (many are apparently from Steeple Ashton).
One box of Jurassic and Cretaceous corals.
One box of crinoids (incl. Apiocrinus).
Two boxes of Jurassic bivalves.
One box of Jurassic brachiopods.
One box of Jurassic and Cretaceous echinoids, and a specimen of Apiocrinus (Bradford-on-Avon).
One box of ammonites and gastropods (mostly Jurassic).
One box of Tertiary gastropods (apparently Eocene forms).
One box of Cretaceous sponges.
One box of Mesozoic invertebrates (mostly Jurassic bivalves).
One box of Jurassic vertebrates:
i) teeth of Strophodus sp.(Great Oolite).
ii) vertebral centra of Ichthyosaurus (possibly from the Oxford Clay).
iii) paddle bones of Plesiosaurus (possibly from the Oxford Clay).
iv) vertebral centrum of an unidentified saurian.
One box containing a molar of Mammuthus sp. (Pleistocene gravel).

It is somewhat surprising that no adequate study of Crabbe's geological activities has yet been undertaken, particularly as he was a contemporary of William Smith (1769-1839), the Rev. Joseph Townsend (1739-1816) and other pioneer British geologists(4), and because he obviously cultivated a strong interest in minerals and fossils during the later formative period of Geology in western England. Hopefully the above information will encourage such a study to be made in the future.

* in parenthesis.

The writer thanks Mr. J. Barton of Trowbridge Town Hall for making Crabbe's fossils and minerals accessible for study.

J. B. Delair,
19 Cumnor Road,
Wootton, Boar's Hill,
nr. Oxford.

Notes

(1) Crabbe, George. 1834. "Life of George Crabbe" (London). This author was Crabbe's son.

(2) v. Dict. Nat. Biogr., (1908 reissue), vol. iv, pp. 1353-1355.

(3) v. Wilts. Arch. & Nat. Hist. Mag., vol. xiii, 1872, p. 315.

(4) ibid.

COLLECTIONS AND COLLECTORS OF NOTE

32. TOWNELEY HALL MUSEUM, BURNLEY

The geological collections at Towneley Hall consist of over two thousand specimens from many sources. Major donors are listed below with some biographical details where known. With the exception of the Magson collection, these have all been combined as a single reference collection.

Bond, F. C. of Preston. Collection of agates from Uruguay and Oberstein. Was working on collection at Towneley Hall in 1947.

Dickson, E. (F.G.S.). Solicitor, Preston, d. 1929. Mainly Red and Coralline Crag molluscs, c. 200 specimens. Published some papers in Liv. Geol. Soc., 1886, 1889, 1893, 1895, 1900. Obit. in Proc. Geol. Soc. Lond. 86, p. 66.

Eastwood, T. 1888-1970. Born Burnley. Geol. Surv. 1911-49. c. 200 rocks, fossils, minerals collected 1906-12.

Macfarlane, J., Burnley. Rocks from Scottish Highlands. Donated 1951.

Magson, I. L., Littleborough, d. 1952. Primarily archaeologist. c. 300 rocks, minerals, fossils - all stuck to cards.

Thackwray, J., Burnley. Rocks from Arran. Donated 1951.

Williamson, I. A. (M.Sc., B.Sc., F.G.S., M.I.Min.E.). Late of Burnley, now at Wigan. Local and British rocks, minerals and fossils. Donated c. 1951.

Other collectors' names which occur in the collections and about which we know little include:-

Ainsworth, W. Fossils donated 1923.
Beattie Fossils donated 1928.
Croston, J. W. (F.G.S.) Minerals.
Dean, W.
Evans, E. A few fossils, rocks, minerals.
Hall, Miss. Polished pebbles and agates.
Heys, G. M. (F.G.S.) d. 1976. Fossils donated 1960.
Hind, J. Fossils donated 1952.
Myers, F. Fossils.
Shackleton, J. Minerals.

Hubert R. Rigg,
Towneley Hall Art Gallery & Museums,
Burnley, Lancs., BB11 3RQ

COLLECTIONS AND COLLECTORS OF NOTE

33. JAMES M'DONNEL. M.D. (1754 - 1832).

In G.C.G. volume 2 no. 7 in the list of geological collections reproduced from the Edinburgh Philosophical Journal 21 (1829) in the section on Ireland, the only reference to a Belfast collection is that of Dr. Macdonald. To the best of my knowledge and that of colleagues consulted here there was no widely known collector of that name in Belfast in 1829. There was however Dr. J. M'Donnell who was extremely active in the cultural life of the town, and a collector of note, and it is fairly certain that the reference in the Edinburgh Philosophical Journal is to him, the name being mis-spelled to conform to Scots convention!, as are many other names in this list.

James M'Donnell was born in 1762, the second son of Michael M'Donnell of Cushendun, Co. Antrim, one of the oldest and best known families in the north of Ireland. His early education was under David Manson, a well known Belfast schoolmaster, and he graduated in medicine at Edinburgh University in 1784, where, incidentally, his thesis was on the treatment of the drowned, proposing the transfusion of blood if all else failed.

He returned to Belfast to practise and, due very largely to his professional and literary achievements, rose very quickly to a prominent position in the cultural life of the town.

He was the first President of the Belfast Literary Society, a founder of the Linenhall Library (the finest early library in Northern Ireland), one of the earliest honorary members of the Geological Society of London (1807), and an early member of the Belfast Natural History and Philosophical Society, the cultural focus in the north of the country at that time.

He was widely noted for his fine library and an extensive collection of natural history material, particularly geological specimens, but our information on this collection is entirely bibliographic at the present time. There is no known catalogue of his collection, and the only description of any of its contents is a reference in a recently discovered manuscript diary of a tour of Co. Antrim made by Samuel Wright (uncle of Joseph Wright whose brachiopod and foraminifera collections are so well known) in 1806. The extract reads:

"Called upon Dr. McDonnell (sic) who is as remarkable for his hospitality as his extreme mineralogical knowledge, he, in the kindest manner gave me uninterrupted access to his valuable library and collection, in the latter are some fine specimens in conchology - but in minerals he is very rich, particularly those of the Co. Antrim - he has the finest series of Belemnites I ever saw - several of them exhibit the alveolus with the chamber structure in the greatest perfection - I am indebted to the Dr. for a great deal of information as to the country I am about to visit, as well as several letters of introduction to different persons in the course of my intended route."

If his collection passed to the Literary Society or the Belfast Natural History and Philosophical Society it is possible that this museum has specimens, but if so, they are at present unrecognised.

His main contributions to geology were unpublished papers read before the Belfast Literary Society which I list here.

1.	Nov. 8	1802	"The topography and mineralogy of the county of Antrim."
	Mar. 26	1804	
	April 23	1804	
2.	April 7	1806	"The resemblance between the fossils of the north of Ireland and those of Italy."
3.	April 6	1807	"Account of a mineralogical itinerary in the counties of Down, Antrim and Derry."
4.	April 4	1808	"Mineralogy of the county of Antrim."
5.	May 1	1809	"Mineralogy of the province of Ulster."
	June 4	1810	
	Oct. 7	1811	
6.	Jan. 4	1836	"Notes on public and private libraries, museums, etc., in the north of Ireland taken from observation, and recommending the formation of one large public library in Belfast."

In Leonard Horner's Presidential Address to the London Geological Society on 26th February, 1846, noting M'Donnell's death, he mentions two short communications to them, one in 1810 on nuts filled with "calcareous spar" dredged from the peat submerged beneath Belfast Lough, the other in 1811 on granite veins penetrating slate in the Mourne Mountains of Co. Down.

The proceedings of the Belfast Literary Society were not published and so the texts of his papers are not now available but it is intended to search the relevant archives to establish whether notes or manuscripts survive. Anything on his main subjects at those dates would be valuable, and for this Group, the contents of the 1836 lecture would be of particular interest.

The only known portrait is a bust of M'Donnell, in middle life, carved by Christopher Moore of Dublin, which is in the collections of this museum.

Brief accounts of M'Donnell are here listed:

Belfast Literary Society 1801-1901 p. 25. Published in Belfast 1902.
Belfast Natural History and Philosophical Society - Centenary Volume. pp. 91-92. Published in Belfast, 1924.
Horner, L. 1846. Anniversary Address of the President. Quart. Journ. Geol. Socy. Lond., 2, 145-6.

Philip Doughty,
Ulster Museum,
Botanic Gardens,
Belfast, BT9 5AB

DISCOVERY OF WORKING DRAWINGS FOR THE SOPWITH MODELS OF 1841 AT THE HANCOCK MUSEUM

Abstract

Working drawings have been discovered for a unique series of three-inch Sopwith hand-models of geological structures present in the Newcastle coalfield and the Northern Pennine lead mines. The drawings are related to the set of twelve geological models published in 1841 by Sopwith. Their historical importance is briefly assessed.

1. INTRODUCTION

For a large part of his professional life, Thomas Sopwith was involved in practical aspects of geology in the Newcastle coalfield and in the lead mines of the Northern Pennines. An understanding of the relatively simple geological structures, gently inclined strata offset by normal faults, of both regions was of very practical importance in the estimation of coal reserves, and in predicting the continuation of a coal seam and a mineral lode displaced by faulting. It must be remembered that the coalfield, and large parts of the lead mining areas were obscured at the surface by spreads of glacial drift. The practical miner was confronted with problems of prediction in three-dimensions, often on the basis of plans of mine workings, which presented very difficult conceptual problems. A geological map or, at a larger scale, a geological plan of mine workings presents a two-dimensional view of a three-dimensional world, the real world of mining and understanding geological structures from a practical viewpoint.

Contemporaries, and near contemporaries of Sopwith had begun to grasp the nettle: Forster (1809, 1821) had presented two-dimensional sections of strata in the orefield, and Buddle (1831) had published two-dimensional traverses of the coalfields. But the problem was three-dimensional, demanding models rather than plans and elevations. Sopwith developed isometric projections as a means of visualisation in three-dimensions, but almost concurrently began to make three-dimensional models of entire coalfields, and hand-models illustrative of particular problems. In this he was following in the tradition of Farey (1811) who 'published an instructive series of coloured diagrams (block-diagrams, see Rudwick, 1976) to explain the natures of faults or dislocations, and tilts of the strata, also of subsequent denudation' - diagrams which may be regarded as the precursors of the famous models afterwards constructed by Sopwith (Woodward, 1911, p.55).

Engineers today concerned with interpreting and understanding the behaviour of geological structures in three-dimensions on the basis of limited site investigation data, have the same conceptual problems as the engineer in the early part of the nineteenth century. Today techniques of engineering geological mapping, or the representation of geological structures for the engineer, make use of every expedient to improve representation and with it understanding. Plans, elevations, cross-sections, fence-diagrams, isometric projections and three-dimensional models are all used as visual, conceptual aids. To a very large extent Sopwith initiated this approach with his insistence on the practical limitations of the conventional engineering plan and elevation, and replaced these first with isometric projections and finally with fully three-dimensioned scale models. His hand-models of basic geological structures, discussed here, mark an important step in the provision of visual aids directed to the clarification and understanding of general geological principles. As such, Sopwith must be regarded as a pioneer in representing geological structures

for the engineer in such a way that he could more easily understand them and their implications: he was a pioneer in engineering geological mapping.

2. THOMAS SOPWITH, 1803-1879 - biographical notes

Thomas Sopwith, born January 3rd 1803 at his father's business premises in Pilgrim Street, Newcastle upon Tyne was "a Northumbrian to the backbone". He was foremost in the scientific community of his day, being an active road and railway surveyor, mining engineer and geologist. He followed his father's trade of cabinet making and from an early age was deft at any interpretation of three-dimensional reality into two-dimensional plans and drawings and in the education of others into the understanding of geological structures. Following a short formal education by such as Atkinson the mathematician, he kept, throughout his life, a meticulous series of diaries and journals in which he used his skills acquired in youth. From his father's trade he developed his unusual talent for drawing and preparing plans. He learnt geology and engraving and his first practical work included geological sections of the Alston mines (1829) and plans for mines in Mexico (1829).

In the spring of 1832 he began a systematic study of isometrical perspective, and on May 21st read a paper to the Natural History Society of Newcastle which gave origin to a well-known and valuable 'Treatise on Isometrical Drawing' (Sopwith, 1834, 1838), which he began to write in earnest in the summer of 1833. The treatise was a great success and received admirable reviews. It covered all practical applications "to Geological and Mining Plans, Picturesque Delineations of Ornamental Grounds, Perspective Views and Working Plans of Buildings and Machinery, and to general Purposes of Civil Engineering; with Details of improved methods of preserving Plans and Records of Subterranean Operations in Mining Districts." This work was the basis for all later plans and models including his own working drawings for geological models. To facilitate isometrical drawing, he invented a set of projecting and parallel rules.

In 1838, following discussions with such colleagues as John Buddle, De la Beche and Dean Buckland, he began to bring to fruition ideas for a series of three-dimensional models of geological structures. He had already begun a series of large-scale models of specific areas, but these simpler models were to be specially designed to assist the geologist and engineer alike in understanding the common structures he was likely to encounter in the field or underground. In 1839 he tried out his models in a lecture to Durham University students and in 1841 he presented a paper on the making of the models, plans and sections, to both the Geological Society of London and to the Institution of Civil Engineers to coincide with the publications of the sets and an explanatory book (Sopwith, 1841; Turner & Dearman, 1979). His models were much admired at the British Association meeting in Newcastle and won him the honour of the Telford silver medal of the Institution of Civil Engineers.

The models were re-explained by Sopwith in 1875, based on six of the original twelve geological phenomena selected by Buckland in the 1830's.

He spent much of his remaining working life from 1845 to 1871 as superintendent to the "WB" lead mines of Allendale, the largest in the world. During a brief resignation in 1856 he visited Egypt and in the following year presented a paper to the Institution of Civil Engineers on the Ferry of Kaffe Azzayat on the Nile, illustrated with isometrical drawings. His health finally failed in his 70's and on his 76th birthday he made the last entry in his 171st diary. He died on January 16th 1879 at Westminster.

3a. SOPWITH's GEOLOGICAL MODELS, 1841

Sopwith (1841) published his models in sets of six or twelve, each series being fitted into a case, bound and lettered to resemble a volume. The models were expensive to make and, unlike a book, could only be produced in relatively small numbers. Publishing the description separately, with lithographed drawings of all twelve models, meant that those who acquired only the set of six elementary models would also be able more readily to appreciate other geological conditions of importance to the owners and surveyors of mineral property represented in the remaining models.

The series of models was intended to provide a simple explanation of various geological phenomena, and particularly three aspects of geology related to practical mining problems including the intersection of mineral veins and the effects of faulting on horizontal strata which could not be so well explained by ordinary drawings or sections as by models. "They are constructed of various kinds of wood fitted together from actual measurements of the strata in the Coal and Lead mining districts of the North of England. The upper part of each model represents the surface of the ground, - the sides exhibit four vertical sections usually drawn in geological works, and the base of each model represents a horizontal plane at a certain depth under the surface, according to the scale of the model. .... Not only do these models conveniently represent a variety of geological features, but as they can be viewed in every position, they at once afford information as to the appearance of the strata, &c., which, under ordinary circumstances, would require numerous perspective drawings." (ibid p. 9-10).

It was suggested that such models were especially adapted for learners and the descriptions which accompanied them should therefore be as plain and simple as possible, free from needless technicalities, and forming with the models a form of geological primer. At an early date, Lyell (1841) appreciated the value of the models and used three simple examples as an illustration of the varying outcrop patterns of inclined strata in a valley.

Buckland selected the first series of six hand-models, and also assisted in the choice of the other six models, from a series of thirty-six models in Sopwith's possession (Table 1). Sopwith remarked that several of his models presented "extremely deceptive and paradoxical appearances, but from that very circumstance they would retard rather than advance the progress of the learner". From an earlier remark, these models would appear to have represented the effects of normal faulting on inclined strata. His didactic approach can be judged from the description of Model V, which is here quoted in full:

"MODEL V - DISLOCATIONS OF COAL STRATA

In the preceding model (IV) the surface presents a deceptive appearance, because numerous beds of coal are seen cropping out, which extend only to a very limited distance, and are not found at any considerable depth. The surface of the model now before us, No. V, presents an equally deceptive appearance, but exactly the converse of the other, for though no coal appears on the surface, yet numerous seams exist below, and this is a usual condition of many large tracts of country under which valuable collieries are worked. In this example the surface of the model exhibits an apparent succession of sandstones and shales - the former represented by satin wood (of a yellowish colour), the latter by dark rosewood; but it will easily be seen that they are merely alternations of the same two rocks. The shale which appears at the highest edge of the model is thrown down by two successive faults and it appears a fourth time, not by means of a fault, but by the effects of denudation only. Two sides of this model represent the horizontal deposition of carboniferous rocks undisturbed by lines of fault; the other two sides exhibit a series of dislocations, such as but too commonly occur in mineral districts. The highest

edge of the model being north, we have:

1st A Slip dyke hading (or inclining) to the north, and throwing down the strata 20 feet.

2nd A Slip dyke hading to the south, and again throwing up the strata 30 feet.

3rd A Slip dyke hading to the south, and throwing up the strata 30 feet.

In all these cases, it will be seen that the slip dyke hades or inclines to that side on which the strata are lowest, a rule, to which as before observed, the exceptions are extremely few. Four seams of coal are seen in each of the four divisions; and, although these seams are dislocated in the same manner as in the preceding model, they yet extend over the whole tract represented by the model - no part of the seams being denuded as in the former examples. If, therefore, the depth and thickness of the several seams are ascertained at any one part, the aggregate thickness and relative depth of the seams of coal are the same throughout the model, though the depth from the surface will vary according to the amount of dislocation by the several faults as already described. Such is the condition under which the most extensive collieries in the north of England are worked - the surface presenting over large areas no basset or cropping out of coal, but merely the associated strata of sandstones, shales, &c., as in the model, while the valuable beds of coal, which are worked for the supply of the London market, exist at various depths below the surface; but the way in which this affects the practical operations of mining will be better understood by the next model.

The horizontal section of the model V, obtained by lifting off the upper portion of the model, affords a curious view of the arrangement of dislocated strata, when intersected by a plane in an oblique direction. Whenever the strata are inclined, the workings, as adits, drifts, levels, headways, or excavations of whatever name, so long as they are carried forward on a horizontal plane, or in any plane not coincident with that of the strata, will intersect the inclined strata in the manner shown by the bisection of model V.

If the strata are horizontal, as shown in this model, then the oblique plane is necessarily inclined, and in this case the direction of the several strata represent the line of bearing of the strata on the oblique plane, that is to say, the direction in which a perfectly level drift, or adit 4, 5, in the Coal would pass on such an inclined plane. But if the lower part of the model is raised at one corner, so that its upper surface shall be level, then in this position the seams of coal will be inclined, and the line 4, 5, being horizontal, will exhibit the true line of bearing of the strata. It may reaily be supposed from this example, how intricate is the problem of intersecting strata, and how requisite it is, in constructing accurate subterranean plans, that due regard should be had to the geometrical condition under which the works are found." (Sopwith, 1875, p. 52-55).

Lithograph and corresponding Model V from the 4-inch set in the Hancock Museum, Newcastle upon Tyne, reproduced as Figs. 1 and 2, are an admirable example of a fairly complex model, made even more useful by the expedient of slicing it in two across an inclined plane. Held with the upper surface level, the lower half of the model then illustrated the effects of faulting on inclined strata. Using this and other expedients, the set of twelve models could be used to illustrate twenty four different configurations of strata, both horizontal and inclined and with and without normal faulting.

Different sizes of model were made; some sets were 3 inches square, sufficiently large for a hand-model but too small for lecture demonstrations. For the latter purpose 4 inch models were made and larger models, for example

8 inches square, were available to special order ....
"Sold in Cases, bound and lettered to resemble large octavo, quarto, or folio volumes, By J. TENNANT, Geologist, &c., No. 149, Strand, London," the prices were:

No. 1 - Set of SIX MODELS, each presenting nine square inches of surface	£2 0 0
No. 2 - The same, on a larger scale of sixteen square inches of surface	£2 10 0
No. 3 - TWELVE MODELS, six being the same as No. 1 nine square inches of surface	£4 0 0
No. 4 - The same, on enlarged scale, sixteen square inches of surface	£5 0 0

The cost of making these twelve models (consisting of 579 separate pieces of wood) very nearly approached the selling price and, even so, the high price restricted any extensive sale.

3b. WORKING DRAWINGS FOR THE SOPWITH MODELS OF 1841

Three-inch and four-inch sets of the 1841 hand-models of geological structures designed by Thomas Sopwith were presented to the Hancock Museum on August 30th 1904 by Henry Robson of 1 Gowan Terrace, Jesmond, Newcastle upon Tyne. E. L. Gill was curator at that time and C. E. Robson, Secretary of the Natural History Society. It is thought that the donor might have been a member of the same family as the Secretary and also one of the Robson furniture family of Newcastle. Working drawings, for that is what they are presumed to be, were donated with the models and their full significance was realised during a re-examination of the Sopwith geological models by the authors at the beginning of 1979.

Description of the drawings

Originally folded three-times, and now split along one fold into two halves (Fig. 3), the original drawings measured 110 mm x 514 mm. They clearly represent the side elevation of a laminated block of wood 3½ inches (91 mm) thick and 19.13/16 inches (503 mm) long, which was presumably 3 inches (77 mm) wide as the block was intended for three-inch square models.

Twenty seven separate layers of wood (the thickest layers are numbered on the drawing) were glued together in a prescribed order. Plank thicknesses shown on the drawing are clearly dressed (planed) thicknesses and these are nominal thicknesses ranging from that of a veneer through 3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 5/16 to 1/2 inch. Thick black lines indicate two thicknesses of ebony veneer used to represent coal seams, and the other strata are colour-washed pink, light purple or left uncoloured. Comparison with the lithographs of the published series of 1841 models suggests that the pink and light purple layers represent argillaceous strata including shales, whilst the apparently uncoloured layers are sandstone and limestone.

Colour prints were made of the original drawings for record purposes and on these the sandstone layers appear to be coloured a very pale yellow-brown which was not discernible on the original drawings. Now the distinction between limestone and sandstone can be appreciated, and the colouring fits the interpretation of the sequence of beds.

From Sopwith's descriptions, and identification of the woods used in the two sets of models in the Hancock Museum, the correlation in Fig. 4 may be made.

It is evident that three-inch lengths were sawn off the laminated block and then sawn either along the junction of Beds 11 and 12 or Beds 12 and 13 to give the blocks from which models involving horizontal strata were made. Five models with inclined or vertical strata were sawn, as shown on the drawing, from the offcut block, leaving an intriguing slab of the complete sandwich, half an inch thick.

Instructions for Models 1 to 8 are reasonably explicit; there are no sawing diagrams for Models 9, 11 and 12, and the drawing for Model 10 is, to say the least, enigmatic. Of particular interest are the clear indications that Sopwith was developing his ideas on how the models should appear: roughly shaded areas have to be removed; the outline of Model 3 is changed; cutting instructions of Model 4 have three variations in pencil; the whole concept of Model 16 is changed by reorientating the base of the model; cuts representing faults have to be glued; certain offcuts are marked 'keep'.

Where the cuts for faults are obliquely across the block, the simple elevations in Fig. 3 are an insufficient guide. Cutting sequences, cut directions and inclinations and offsets for Models 11 and 12 are given on the back of the drawing (Fig. 5). There is clearly some confusion over Models 6 and 7 which are renumbered 9 and 10 on the reverse side of the drawing, with intersecting rather than parallel cuts along the faults.

Of particular interest are the clear indications (Fig. 5) that the outlines of several of the drawings have been pricked through, presumably to transfer the outlines to the laminated wood block.

Twenty-two different models can be accounted for, including only one specific example (Model IV) in slightly inclined faulted strata. This does not include Model 10 outlined on Fig. 3., in which three solid cut lines are indicated. The upper line is reminiscent of the surface topography in Model II, 'Coal strata near Newcastle on Tyne' with the normal horizontal Lower Carboniferous sequence rather than the gently inclined coal measures succession in Model II (Sopwith, 1841, p. 28). The two lower lines could represent a modelled valley cut into horizontal strata, similar to Model Ia of the 1841 set.

The succession of strata shown in the drawings

On the working drawings, twenty seven different beds are numbered and colour-coded and the succession is the same as that in the 1841 illustrations of the models. A complete succession can be built up from the drawings of Models I, VII and X (Fig. 6), and from this and the colour coding on the original working drawings (Figs. 3, 4) the lithological succession can be inferred. Sopwith, in his description of Model I, identifies Bed 2 of the working drawing as Pattinson's sill, Bed 4 as the Little Limestone, Bed 10 as the Great Limestone, Bed 11 as the tuft, and describes the lithology of Beds 1, 7, 12. The Four fathom Limestone, mentioned in the account of Model IV is Bed 18. Bed 23 is therefore the Three yards Limestone, and Bed 27 the Five-yard Limestone - the lowest limestone reached by mining operations in East Allendale (Dunham, 1949, p. 20).

The inferred succession has been compared with that given by Forster (1821, p. 167-168), and cross-correlations between this source, the working drawings and the 1841 descriptions are given in Table 2.

The succession of strata from the Nattrass Gill Hazle up to the Girdle Beds above Pattinson's Sill is also published on 'The Plan of Holyfield Lead Mine' (Sopwith 1829). From the various descriptions of the strata available, the lithology of the beds coloured light purple, Beds 1, 12 and 19, can be determined.

Bed 1 is Girdle Beds with Plate (Forster, 1821, p. 167); Bed 12 is Plate and Grey Beds (Sopwith, 1829); Bed 19 is Plate and Grey Beds (Sopwith, 1829). Bed 26, also coloured light purple presents a problem; it is called plate by Forster (1821, p. 169), and is drawn as a distinct layer on the cross-section of Hudgill Cross Vein (Sopwith, 1829) and in the section by Wallace (1861, Plate I) but is not mentioned in the succession of strata in the Alston district published by Sopwith in 1843. It must be presumed that, by comparison with the other groups of beds, it is plate with thin beds of hazle.

Sopwith's description of Model IV, 'Surface indications of coal', explains the inclusion of the coals seams, Beds 14, 16 and 21 in the succession above the Three Yards Limestone (Table 2). The model represents several associated beds of limestone, sandstone and shale below the Great Limestone which, on the north side of the River Tyne, contain beds of coal. This departure from the Alston succession was probably introduced by Sopwith to extend the practical value of the models more into the sphere of coal mining, and the implications are discussed below.

In the published cross-section of the Holy-field Lead Mine at Alston the section of the strata from the Nattrass Gill Hazle up to the High Slate Sill, including Beds 1 to 20 of the working drawing, is drawn at a scale of two chains to the inch (1:1584). This is precisely the scale of the working drawings and although there are some minor variations in the individual thicknesses of the twenty beds in the succession, there is close agreement between the 1829 and working drawing cross-sections. Mainly there are differences in detail in groups of beds 5-8 and 13-17 with the inclusion of four coal seams in the drawings for the models.

Below the Nattrass Gill Hazle (Bed 20) the sequence for Beds 23 to 27 is given on the cross-section of the Hudgill Mine (Sopwith, 1829). Although a lithological correlation may be readily made, the thickness of this group of beds on the working drawing is 127 feet compared with 70 feet on the Hudgill cross-section and the 87 feet given by Sopwith in his 1843 account. It is apparent that the model section below the Nattrass Gill Hazle refers to the much thicker succession north of the Tyne and reported, for example by Dunham (1949, p. 43, Fig. 5) for the Haydon Bridge area.

A synoptic view of the complete range of models

Comparison of the working drawings with both the published set of twelve models and the account and drawings given in the descriptions (Sopwith, 1841) provides a clue to the nature of some of Sopwith's unpublished simple models. A list of models that can be derived from the working drawings is given in Table 3.

Comments on individual models

Models 1 and 2 - Important to note here is the note 'square angle' in pencil along the marked cut-line. The valley bottom will thus be horizontal, and although Model 1 will show the normal stratigraphical succession, the obverse Model 2 will be cut in an inverted succession.

Model 3 - The gently modulated surface is reminiscent of Model II of the 1841 published set, with outliers underlain by the horizontal coal seam, Bed 14. A part pecked, part serrated line in Bed 20 could indicate a parting in the model on the coal seam represented by Bed 21, as Model II is separated along the horizon of the Bensham Seam.

Model 4 - An intriguing diagram with four successive cuts indicated, and two versions of the first cut and three of the second. Comparison with the lithograph of Model III gives a good impression of the final form of this four part model which Sopwith also used to demonstrate anticlines and synclines (Sopwith, 1841,p.42).

Model 5 - This is the inverted offcut from Model 4, representing a valley side in horizontal strata.

Model 6 - A simple block model with repeated normal faults offset in one direction, with shaded parts to be removed, and the cuts to be glued together.

Model 6a (Fig. 5) - Implicit instructions for first and second cuts with offsets, interpreted as instructions for making Model VI.

Model 7 - Slight uncertainty about topography, but clearly a minor variant of Model V with cutting and glueing instructions, and parts to be removed. There are faint alternative lines for the groups of parallel faults.

Model 7a - A version of 6a (VI) with full surface topography.

Model 8 - The pecked line is the profile of the valley bottom, and, with the general outline, is the only indication of surface topography.

Model 11 (Fig. 5) - The drawing gives plan and elevation of the faults with the sequence of cuts and offsets. In the form of a simple rectangular block, faults 1 and 2, lined with white wood, must have been glued before cuts 3 and 4, lined with dark wood, were made.

Model 12 (Fig. 5) - Although there is no indication on the working drawings, it is assumed that Model 12 (XII) is a version of Model 11 (XI) with surface topography.

Model 13 - Simple cutting lines with the valley profile marked by a solid line.

Model 14 - A variant of Model X in which the same group of strata is more steeply inclined at 45° upstream.

Model 15 - Similar to Model IX, but the succession of strata is inverted, and dips at 45°.

Model 16 - Second thoughts here with a change from horizontal to gently inclined (25°) strata. Tentative pencil lines could show proposed valley bottom slopes.

Model 17 - Vertical strata, an unmodelled variant of Model 13.

Method of construction

Sopwith (1875, p. ix) was a little misleading in his statement that the twelve models consisted of 579 separate pieces of wood. Twelve slips of wood representing fault infilling and twenty seven sheets for the stratal block were all that were required. Craftmanship of a very high order was demanded, however, in jointing the laminae into a solid block, and then band-sawing and finishing the surfaces with minimum loss of wood. Modelling of topography into the top surfaces of the blocks was done by eye with only very sketchy outlines of surface form, or perhaps master copies as a guide.

DISCUSSION

Sopwith simplified the models in 1875 by reducing the number of wood layers, and issued a revised set of six chosen from the original twelve models of the 1841 set. It is a tribute to him that Lyell (1841), impressed by the usefulness of the models to the beginner, illustrated three of the models showing V-ing of strata in valleys, but admitted that the drawings were no substitute for examining and handling the originals. As an aid to elementary teaching, echoing Sopwith's insistence that he was writing for the learner in geology, a few surviving models are still used in the Department of Geology of the University of Glasgow (Rolfe, 1979), and a complete set has been used until recently (Thompson and Jones, 1979) at Moorland High School, Burslem, Stoke-on-Trent, and at Southampton University (this issue p.511). Large, eight-inch versions of the 1875 set are also used for public demonstrations in the Geological Museum, South Kensington (Dunning, 1978).

Discovery of the drawings has focussed attention on the models and particularly on the artful way in which they were made. Sopwith mentioned that he had made thirty six different models. Comparison of the drawings, which account for nineteen models and possibly twenty one if drawing No. 10 (Fig. 3) represents two models, with the twelve lithographs in the 1841 description of the models brings the total number of distinct models to twenty four. There is only a hint that some at least of the remaining twelve models illustrated faulting in inclined strata, and it is possible that there were such versions of Models V, VI, VII, XI and XII. The crossed-out version of No. 16 (Fig. 3) is another likely configuration, and it is possible to imagine the large offcut, from which the simple models of inclined and vertical strata were made, being cut in different directions to give beds dipping across the valley and vertical beds running down the valley.

There is no hint on the drawing of the oblique cut surfaces (Figs. 1 and 2) that extend the range of the twelve published models.

An unusual feature in a series of models illustrating the geological structures in the Northern Pennine orefield and the Newcastle coalfield is the inclusion of highly inclined and vertical strata. Although displayed on a very large-scale in the Lemmington and Holborn monoclines skirting Cheviot, steep dips in the coalfield are only present adjacent to large faults (Buddle, 1831b, Sections 1, 2, 3) and in the orefield vertical strata occur locally along the Burtreeford Disturbance, a prominent monocline, and nowhere else. It is to be assumed that Sopwith extended the range of his models for teaching purposes, and he might have been calling on his practical experience in the Forest of Dean Coalfield, which he had begun to survey in 1833 and had modelled in 1837, where there is a major monoclinal structure.

ACKNOWLEDGMENTS

We are indebted to A. Tynan, Curator of the Hancock Museum for permission to photograph the Sopwith models in the collection.

Mr. F. Dunning, Curator, Geological Museum, London, kindly supplied photographs of the 1875 set of six 8 inch models.

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GLOSSARY

Girdle Beds	Thin beds of hard stone
Grey Beds	Thin beds of hazle, seldom above an inch in thickness, alternating with thin beds of plate.
Hazle	Beds of fine-grained sandstone. Also referred to as Coarse Hazle, or Ribony Bind.
Plate	Lithological term for shales in the Yoredale Series and Millstone Grit of Yorkshire.
Till	Hard Shale.
Tuft	A variety of porous, soft, bedded sandstone.

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Engineering Geology Unit,
University of Newcastle upon Tyne

Susan Turner,
Hancock Museum,
Newcastle upon Tyne

MODEL NO.	
I	Stratified rocks and valley of denudation
II	Coal strata, near Newcastle-on-Tyne
III	Dislocation of strata in Carboniferous rocks
IV	Surface indications of coal
V	Dislocations of coal strata
VI	Intersection of mineral veins
VII	Surface denudation of mineral veins
VIII	Overcutting of strata
IX	Undercutting of strata
X	Denuded basset of inclined strata
XI	Vertical intersection of mineral veins
XII	Denudation of minerals veins

Table 1 The geological subjects of the set of twelve geological models published in 1841

Forster's 1821 Section of the Strata in the 'Lead Measures'			Sopwith Working Drawings			Sopwith Description of Models 1841
Local Names	No.	Thickness (ft)	Nominal Plank Thickness (in)	Bed No. on Laminated Block	Thickness Scaled From Drawing	Rock Type
Small Limestone Quarry Hazle	156) 157)	30	3/16	13	20	Sandstone
Coal	*)		V	14	3	Coal
Plate	158)	34½	1/8	15	11	Shale
Coal	*)		TV	16	3	Coal
Till Bed	159)		3/32	17	10	Shale
Four Fathom Limestone	160	24	3/16	18	23	Limestone
Plate	*)	18	3/32	19	11	Shales with thin hard sandstone
Mattrass Gill Hazle	161)		5/32	20	16	Sandstone
Coal	*)	33	V	21	2	Coal
Plate	162)		5/32	22	19	Shale
Three Yards Limestone	163	9	1/8	23	11	Limestone
Plate	*+)	36	5/16	24	40) 65	Shale
Six Fathoms Hazle	164)		7/32	25	25)	Sandstone
Plate	165	10½	1/8	26	15	Shale with thin beds of sandstone
Five Yards Limestone	166	30	1/4	27	36	Limestone
TOTAL THICKNESS	441				478	

TABLE 2 The succession of strata represented by the models.
*Beds not listed by Forster; V - veneer; TV - thick veneer; +Bed not listed by Sopwith 1843

Forster's 1821 Section of the Strata in the 'Lead Measures'			Sopwith Working Drawings			Sopwith Description of Models 1841
Local Names	No.	Thickness (ft)	Nominal Plank Thickness (in)	Bed No. on Laminated Block	Thickness Scaled From Drawing	Rock Type
Plate Girdle Bed Plate	140) 141) 142)	36	1/4	1	32	Shales with thin hard sandstones
Pattinson's Sill or Hazle	143	12	3/32	2	10	Sandstone
Plate	144	18	3/16	3	21	Shale
Second or Little Limestone	145	9	1/8	4	14	Limestone
Plate	146	18	3/16	5	14	Shale
High Coal	147	1½	V	6	1	Coal
High Coal Sill Plate	148) 149)	19½	1/4	7	28	Sandstone
Low Coal	150	1	V	8	2	Coal
Low Coal Sill Plate	151) 152)	28	1/8	9	18	Shale
Third Tumbler Beds, black Bed and Great Limestone	153	68	1/2	10	62	Limestone
Tuft or Water Sill	154	9	1/8	11	14	Sandstone
Plate	155	22½	5/32	12	17	Shale with a thin limestone

Table 2 (cont.)

Model No.	Equivalent Model No. in 1841 Set	Description
1		Horizontal valley of denudation in horizontal strata.
2		Horizontal hill of denudation in horizontal strata.
	Ia	Inclined valley of denudation in horizontal strata.
	Ib	Inclined hill of denudation in horizontal strata.
	II	Coal strata near Newcastle-on-Tyne
3		Modelled topography in horizontal strata.
4	III	Dislocation of strata in Carboniferous rocks.
5		Erosion surface, with parallel contours, in horizontal strata.
6		Repeated normal fault offset of horizontal strata; plane surface topography.
	IV	Repeated normal fault offset of nearly horizontal strata; with full topographic expression.
6a	VI	Crossing normal faults in horizontal strata, with surface expression of one horizontal coal seam.
7	V	Repeated normal fault offset, with trough faulting, in horizontal strata, with full topographic expression.
7a	VII	Crossing normal faults in horizontal strata, with full topographic expression.
8		Valley in horizontal strata (topography more pronounced than in Model Ia).
9=6a	VI	
10=7a	VII	
11	XI	Vertical intersection of mineral veins; plane surface topography.
12	XII	Denudation of mineral veins; full topographic expression.
13		Vertical strata crossing a valley; full topographic expression.
14	X	Strata inclined upstream in a valley; denuded basset of inclined strata.
15	IX	Strata inclined downstream steeper than valley slope; undercutting of strata.
16		Inclined strata in plane surface topography.
17		Vertical strata in plane surface topography.

Table 3 Comparison of the models shown on the working drawings with the twelve models published in 1841.

V

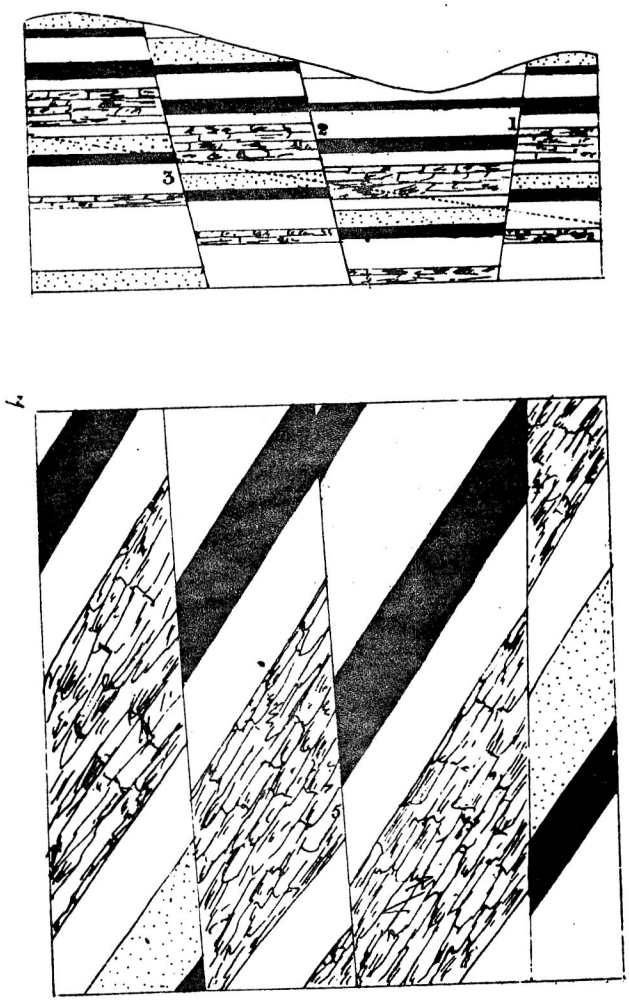


Fig. 1 Lithograph of Model V, Dislocations of Coal Strata, from Sopwith's description of the models (1841). Above: elevation of one vertical face of the model; the pecked line inclined left to right is the oblique cut line. Below: the outcrop of faulted strata on the inclined cut across the model.

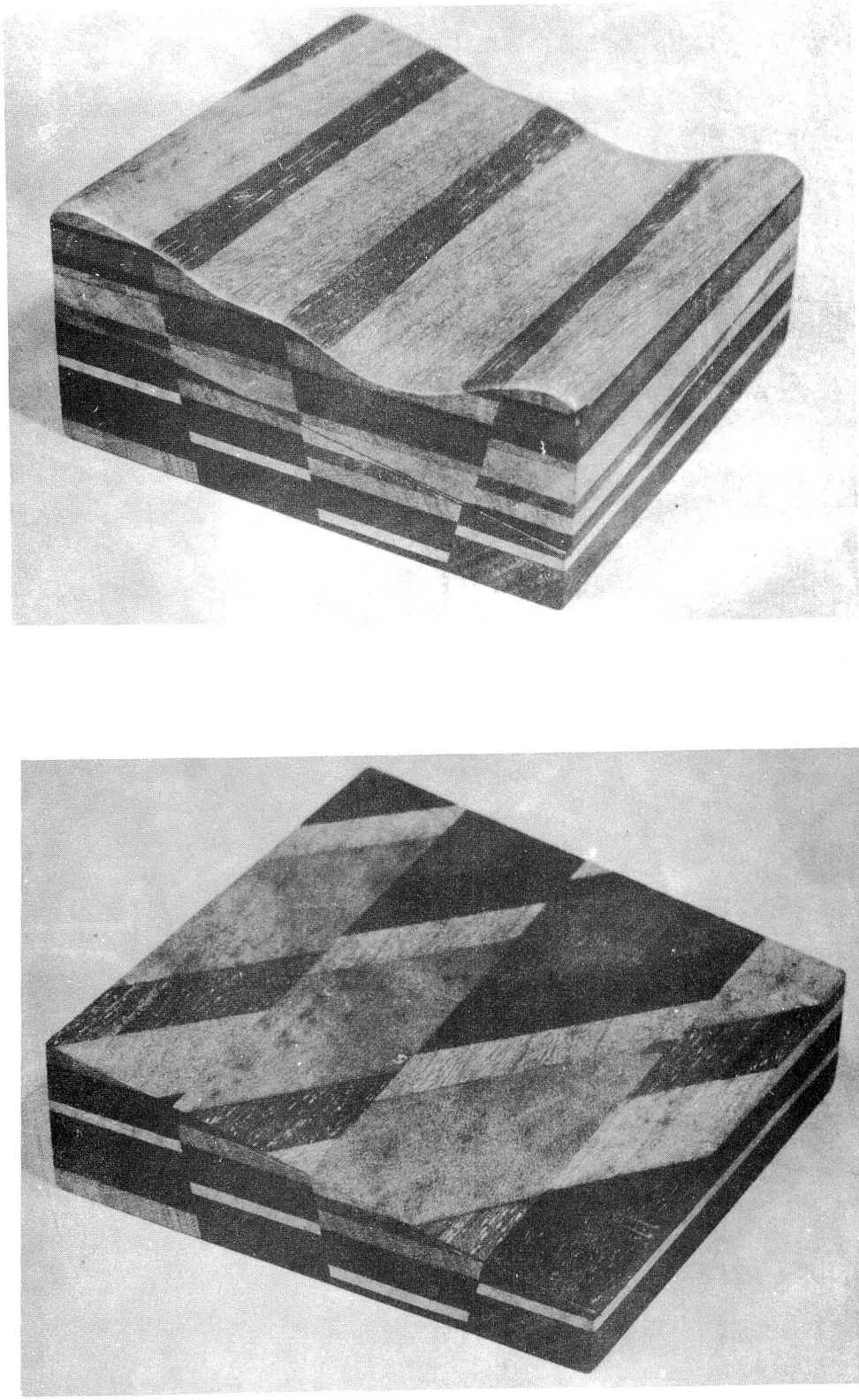
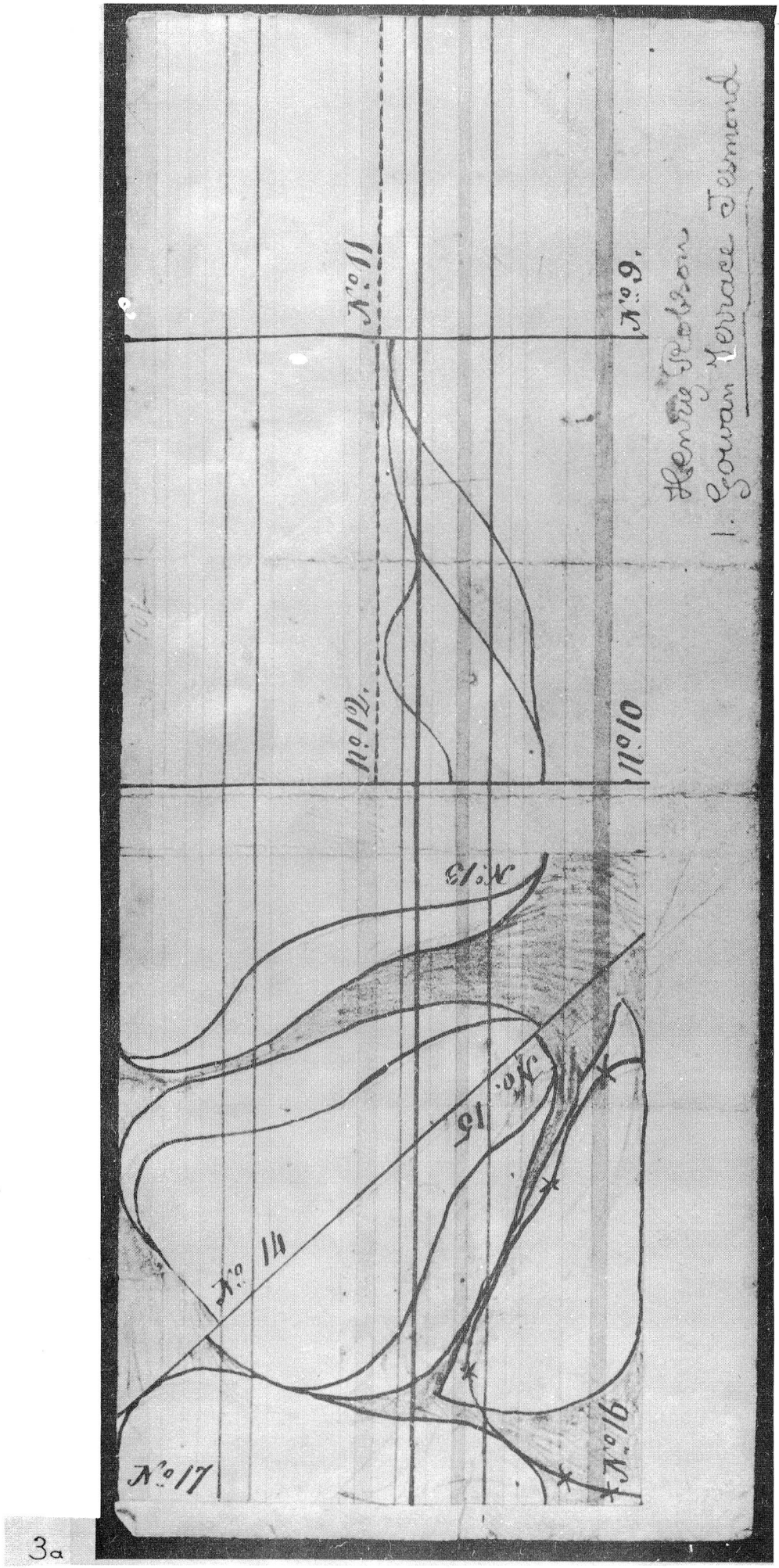
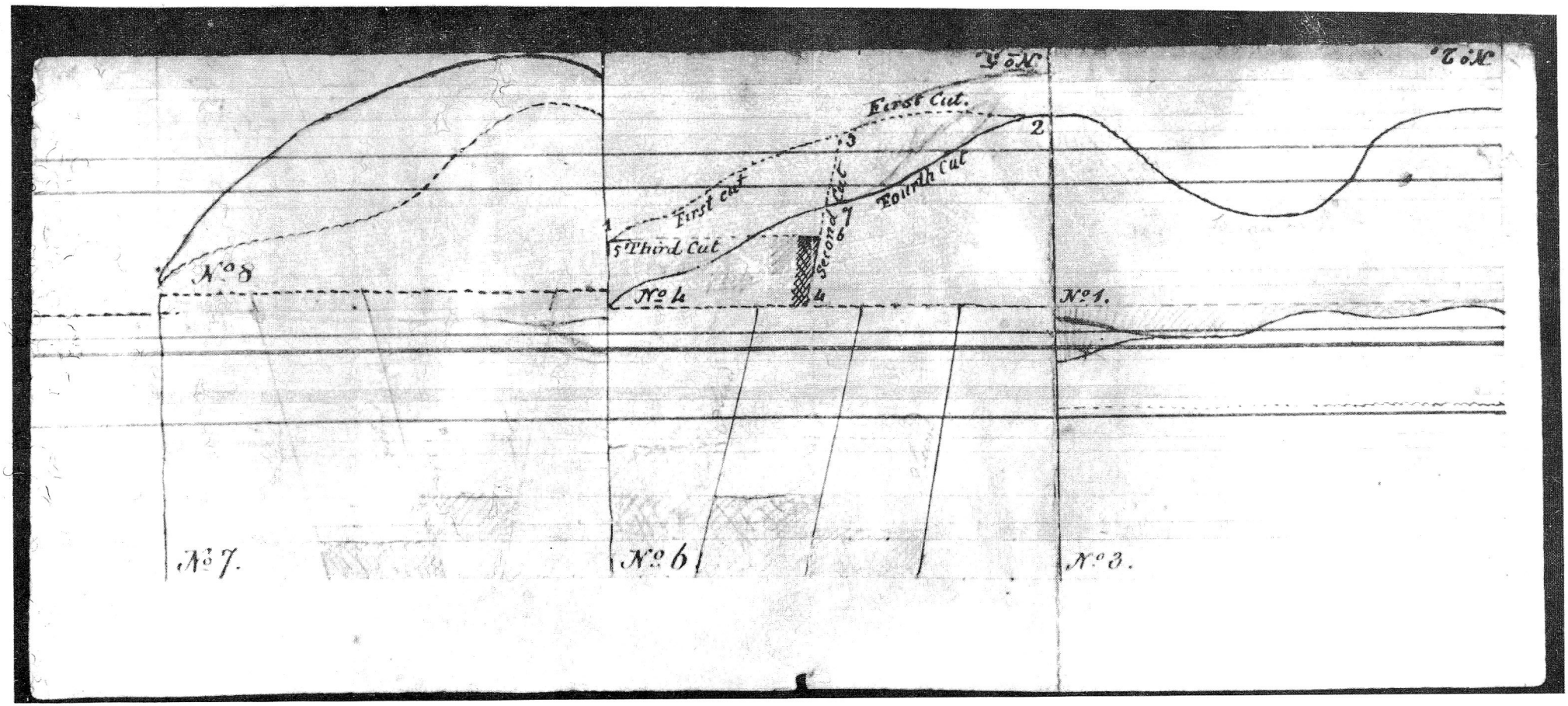


Fig. 2 A four-inch version of Model V showing, above: the complete model, and below: the lower half of the model showing the inclined cut plane-surface.



Figs 3a & b The original working drawings showing the outlines of various models on the side of the laminated wood block.


No 8
No 7.
No 5
First Cut.
First cut
Second Cut
Third Cut
Fourth Cut
No 4
No 6
No 2.
No 1.
No 3.

ROCK TYPE	LOCAL ROCK NAME	SYMBOL ON LITHOGRAPHS	COLOUR ON WORKING DRAWING	WOOD TYPE	WOOD COLOUR
Coal	Coal		Black	Ebony	Black
Sandstone	Hazle		Pale yellow-brown	Satinwood	Yellowish
Limestone	Lime-stone		Uncoloured (? pale blue, faded)	Sycamore	Light buff
Shale	Plate		Pink	Mahogany	Reddish-brown
Shales with hard sandstones	Girdle Beds; Plate with Grey Bands		Light purple	Dark Rosewood	Dark brown

Fig. 4 Correlations between symbols on lithographs, rock type, colours on the working drawings and woods used in the manufacture of the models.

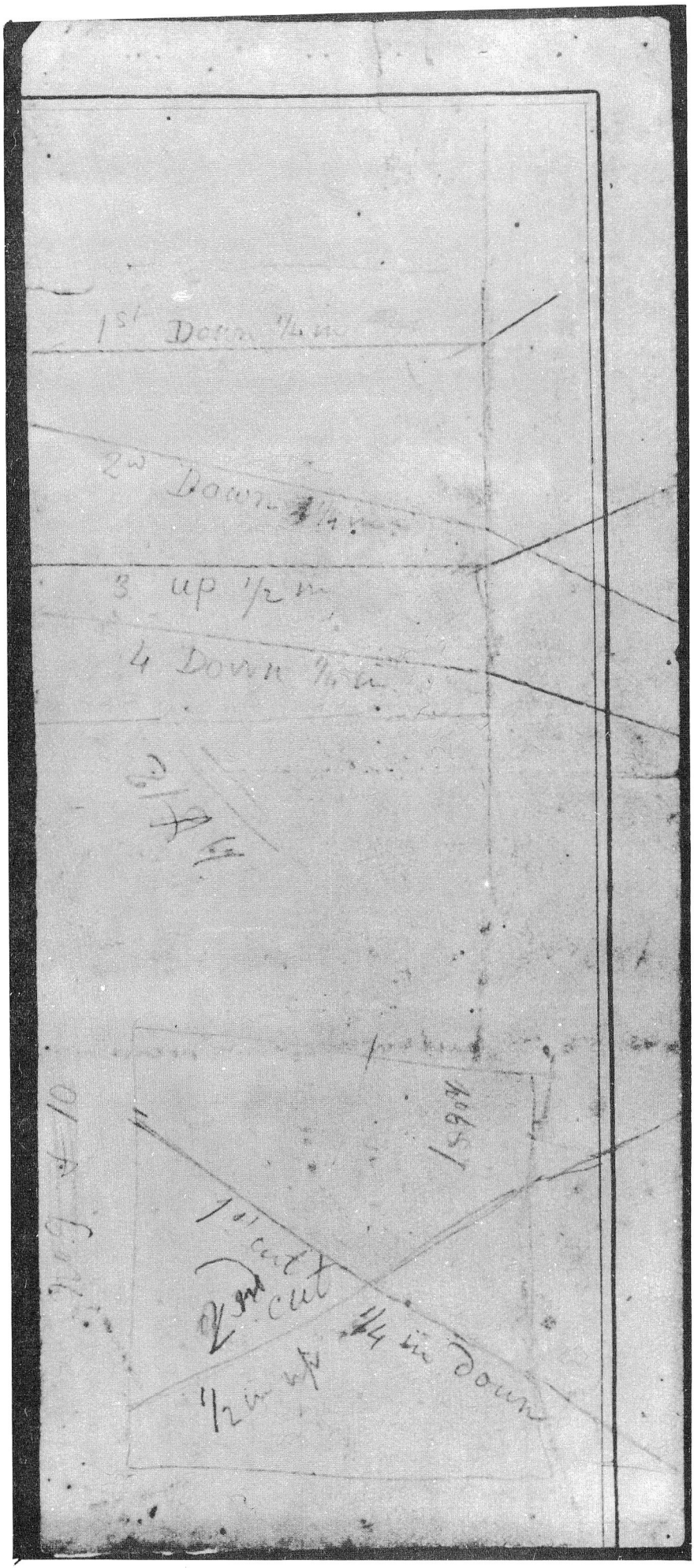


Fig. 5a The reverse side of the original working drawings shown in fig. 3a showing instructions for making faulted models.

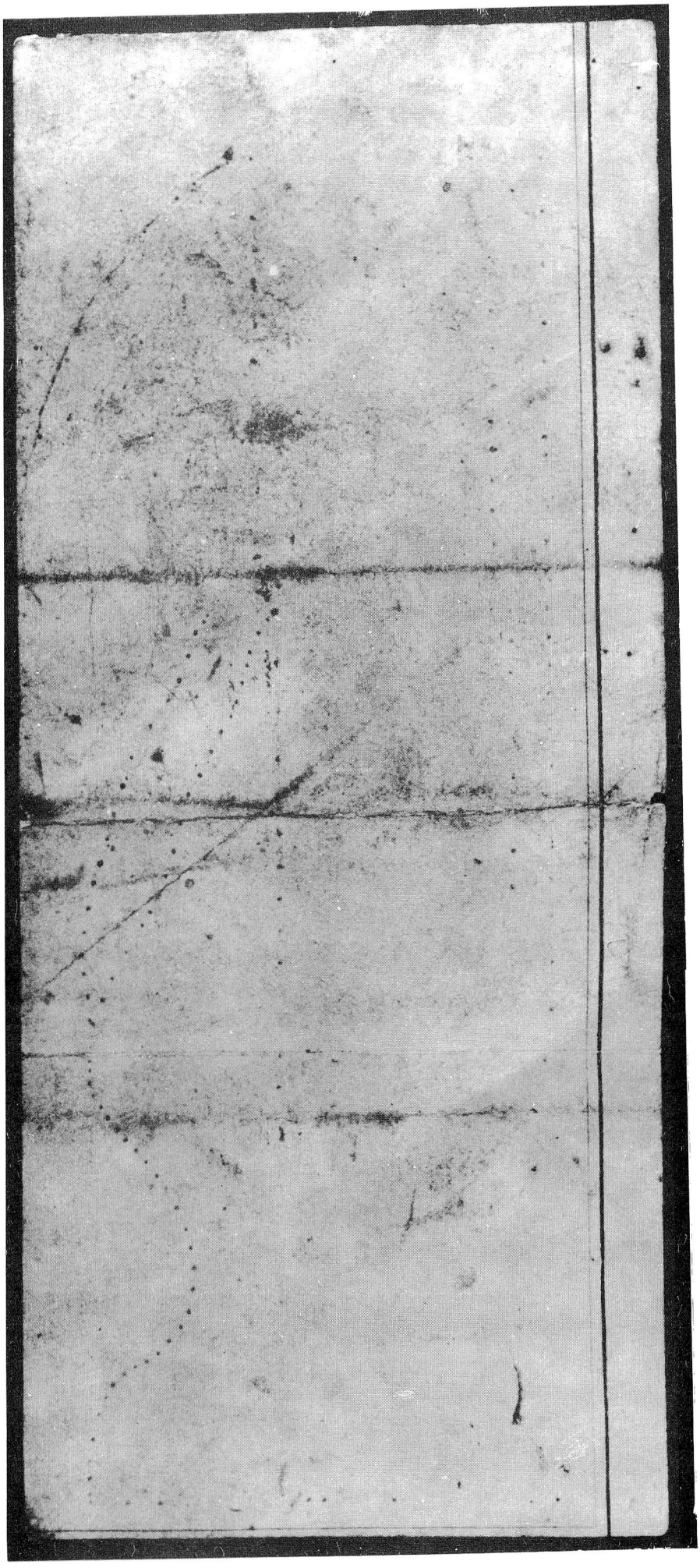


Fig. 5b The reverse side of the original working drawings shown in fig. 3 b showing the prick marks made in transferring the drawings to the wood block.

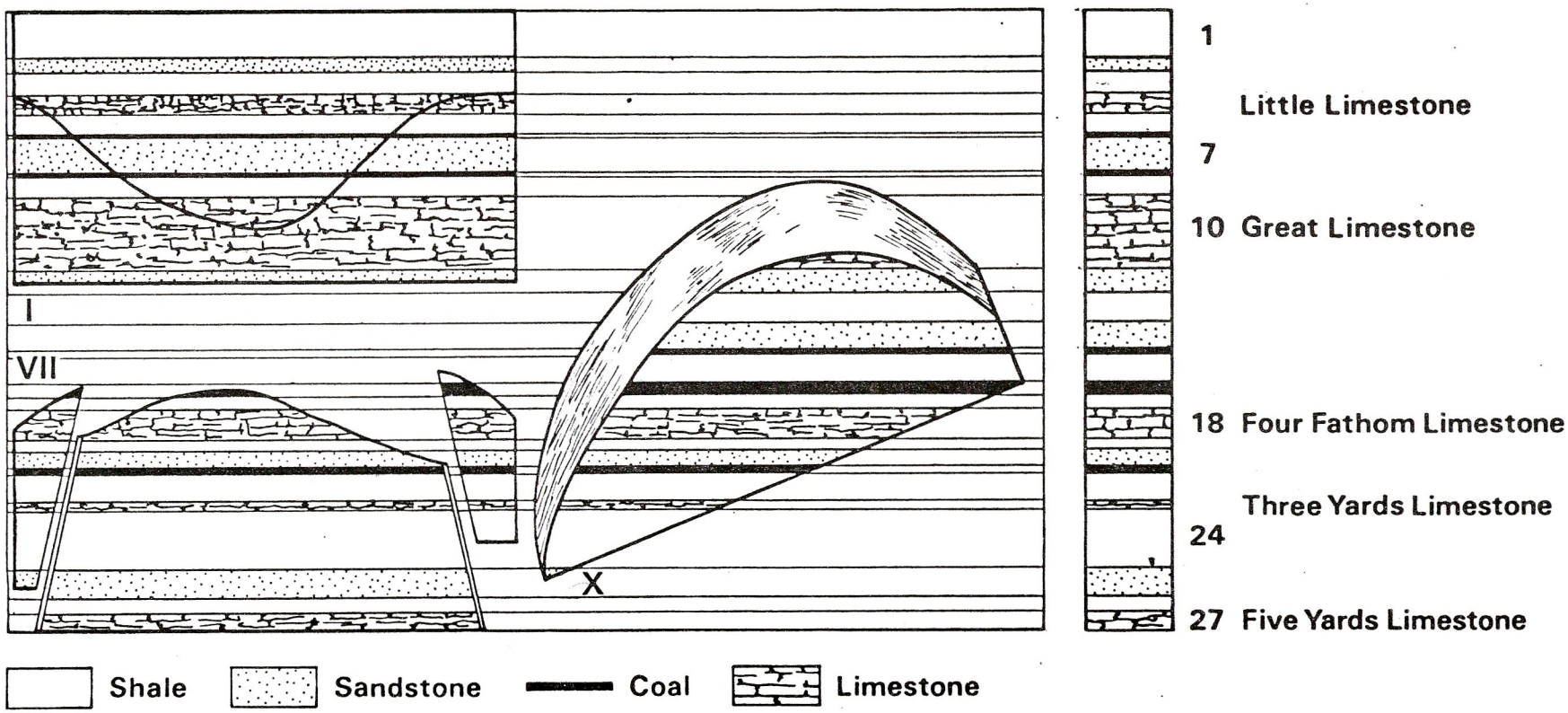


Fig. 6 The stratal succession in the Carboniferous Limestone Series of North Yorkshire inferred from the lithographs of Models I, VII and X. Bed numbers are those shown on the working drawings (Fig. 3).

A COLLECTIONS RESEARCH UNIT FOR THE MIDLANDS REGION

On February 19th 1980 an ad hoc meeting of the Midlands region Natural Sciences curators (together with other interested parties) agreed to establish a Natural Sciences Collections Research Unit for the Midlands. Support and encouragement was offered by the existing Midlands Area Service. This support was accepted on the understanding that other arrangements may have to be made should that service at any time split into East and West Midland Services, in order that the Research Unit could continue to operate over the Midlands region as a whole.

The Midlands Collections Research Unit (Natural Sciences) will work along much the same lines as the established Units in the North-west and Yorkshire and Humberside. The accumulated data are to be placed on file at the Manchester University Computing Centre and processed using the FAMULUS package and with Charles Pettitt (Manchester Museum) responsible for data input, updating, and initial production of catalogues. The regional organisation, however, differs from that in operation elsewhere in that a panel of curators have been given the responsibility for listing all the 'minor', private, university and other collections in the region, arranging for visits to be made to uncurated collections, and vetting the input forms to ensure that entries conform to minimum standards before being passed on to Manchester. So access by record compilers to the computer will, at the initial stage, be via the appropriate panel member. The input forms are based on those used by the N.W. and Y. & H. Units with minor modifications and are now available (with instructions) from the Secretary.

One of the panel members has been co-opted onto the GCG committee to ensure that specialist curatorial requirements are met in the data gathering and recording stages. It is intended that the involvement of GCG as a national body will achieve national consistency in the level and detail of geological collection documentation in this and future regional schemes. Palaeontology collections constitute an area of particular concern and it was agreed that more precise data on fossil collections would be recorded than has been attempted in previous schemes (including stratigraphic information at least to System level). This has enabled Charles Pettitt to build into the scheme the facility to list palaeontological collections in the register in stratigraphic order by geological system.

Panel membership was decided by subject speciality and geographical location; because of the size of the area to be covered there was an agreed duplication of expertise in the east and west. We therefore have a specialist geologist, botanist and zoologist for both the eastern and western counties, and a secretary/convenor making seven members in all. Each panel member will vet the input forms from compilers in his area, compile a list of institutions, societies and individuals holding natural history material for an agreed area around his operational base, and prepare a list of subject specialists willing to visit uncurated collections.

Composition of the Midlands Panel

East	John Crossling (Derby)	Geology
	Tony Fletcher (Leicester)	Botany
	Graham Walley (Nottingham)	Zoology
West	Tristram Besterman (Warwick)	Geology
	Brian Abell Seddon (Birmingham)	Botany
	Geoff Halfpenny (Stoke)	Zoology

Convenor/Secretary John Mathias (Leicester)

This achieves a fair spread of expertise throughout the Region and with a division of labour along these lines we expect most of the traceable collections to be on file by February 1982. Regular meetings will be held for all contributors to sort out problems and to check progress towards the 1982 deadline.

The most difficult task initially is to make as complete a list as possible of all collections in the region. So will anyone who has experience of collections and collectors in the Midlands, particularly in the private, academic or educational fields, please contact me or the appropriate panel member with the details at the earliest opportunity.

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96 New Walk, Leicester
Tel: 0533 - 554100 ext. 262

Charles Pettitt of the Manchester University Computer Centre has kindly sent the following copies of the General Guide Lines for completing Data Input Sheets, the Specific Guide Lines for completing them and a sample of the proposed Data Sheet. It is hoped that members will study these and, if they have any suggestions or misgivings, contact John Crossling or Tristam Besterman or Charles Pettitt himself. These are the modified versions produced for the Midlands.

MANCHESTER MUSEUM COMPUTER CATALOGUING UNIT

GENERAL GUIDE LINES FOR COMPLETING DATA INPUT SHEETS

CHARACTER SET

It is preferrable that data for input should be TYPED, although careful HANDPRINTING may be accepted.

If HANDPRINTING, the following characters must be written thus:-

One: 1 Eye: I Oh: ϕ Ess: S Zed: Z Seven: 7

Foreign dipthongs, such as ü, ö, ø, should be rendered as UE, OE, etc.

Example: Müller = Mueller

[Square] or <Angle> brackets may be entered by hand if they are unavailable on your typewriter.

CLARITY

Please take care to complete the input sheets clearly and neatly. Sheets difficult to decipher will be rejected by the data-prep. operators.

DOUBTFUL DATA

If uncertain of the validity of any item, eg if a word is difficult to decipher on an old label or manuscript, or the exact spelling of a place name is unknown, put a question mark after it.

UNUSUAL DATA

Any information that does not seem to fit into any of the available boxes should be placed in the ADDN box (or NOTE box if present).

EXCESS DATA

If all the relevant information will not fit into a box, it may be continued on a separate blank sheet; the extra sheet or sheets must be fastened securely to the input sheet.

Finish the entry in the box with '(Cont)' and repeat the box name in brackets at the start of the overflow.

Specific FORMATS

The following items of data must be entered in the same way by everyone, so please follow the formats shown.

1/ Personal names

FORMAT: SURNAME (IN CAPITALS), INITIALS OR FORENAMES [TITLE]<QUALIFICATIONS>(Any other relevant information.)

(N.B.: INITIALS may be followed by either a space or a full stop).

Examples: SMITH, J.Arthur [Dr] <Ph.D, F.L.S>
JONES, A F <B.Sc> (1906-)
BLACK, [REV] (Rosacea Colln only)

2/ Dates

FORMAT: Year Month Day

Abbreviate month to the first three letters (In CAPITALS).

Elements of the data may be continuous or seperated by a space.

Examples: 1969SEP27, 1943 JAN 03, 1917ØCT

3/ Prices

FORMAT: currency name (in CAPITALS) or symbol Value in figures

(N.B.: English money should always be given in DECIMAL).

Examples: £2000 US$750 KROENER423
£0.15 NOT 3/- or 15p

4/ Ranges

Use = to join terms indicating the limits of a range.

Examples: 1917JAN = 1920DEC
£150 = £500
2000m = 3670m

Use of ABBREVIATIONS

Frequently recurring terms or phrases may be assigned 'local' abbreviations, provided the full meaning of any abbreviation used is recorded and submitted with the input sheets.

Unusual strings of characters should always be chosen as abbreviations, otherwise unwanted expansions may occur during computer editing.

It is suggested that 'X' or 'Z' is added to the first non-vowel character of the term or phrase.

Examples: MICROSCOPE SLIDE = MX
EGYPTIAN = GX

INCOMPLETE DATA

Enter only what information you have available. Do not worry if several boxes are blank, for if additional information becomes available later it readily can be included in the computer file.

SPECIFIC GUIDE LINES FOR COMPLETING DATA INPUT DOCUMENTS FOR COLLECTION RESEARCH UNITS (NAT. HIST.)

DEFINITION OF 'COLLECTION'

For the purposes of this register a "collection" can be considered as one or more objects held in an institution, or in private hands, which can be identified with a named collector. Unattributed material should also be recorded (see 1CØLL below).

LARGE COLLECTIONS

If one person's collection falls conveniently into two or more readily identifiable discrete parts - on the grounds of subject matter or locality of origin (eg South African minerals, British Carboniferous plant fossils and Oligocene insects from the Isle of Wight) then each part should be recorded on separate input sheets.

CONFIDENTIALITY

It is the express policy of all C.R.U.'s that details of collections held in private hands should only be submitted for inclusion provided the responsible curator has obtained permission from the collection owner. It is considered ethically important that the possible dangers of including their names and addresses should be pointed out to such owners, and the provisions we have made for preserving confidentiality explained to them.

Confidential information should NOT be entered on an input sheet, but preserved securely at the originating institution. (See also below under 1CØLL, 11BIØG, 12MUSE). If in doubt, contact your local C.R.U. committee or Mr. Pettitt at Manchester Museum.

BØX by BØX GUIDE (Refer also to 'General Guidelines' sheet)

1CØLL Give SURNAME, initials or forenames, [Title]<qualification> (date of birth - date of death)

If UNATTRIBUTED, enter the title of the Holding Institution.

If CONFIDENTIALITY has been requested, enter 'CONFIDENTIAL'

Examples: Echalaz, C T [Lt. Col] (1844=)
Brown, V. [Reverend] <M.A.OXON> (1900=1974)

2SUBJ Subject of the collection.

STRATIGRAPHIC INFORMATION, if available, should be included here for rocks and fossils. If a significant part of the collection has precise stratigraphical data, such as 'Barton Beds' or 'Lias', this should be recorded. Where possible all relevant collections should be referred to one of the following main systems:-

QUATERNARY	TRIASSIC	SILURIAN
TERTIARY	PERMIAN	ORDOVICIAN
CRETACEOUS	CARBONIFEROUS	CAMBRIAN
JURASSIC	DEVONIAN	PRECAMBRIAN

Examples: 'Marine shells', 'mounted moths', 'Jurassic echinoderms', 'Jurassic L. Lias ammonites', 'Tertiary Barton Beds molluscs'.

3GEØG Geographical region from which the majority of the material originates. If more than one region is represented give them all, separated by a semicolon.

For BRITISH collections include County or Counties covered, if possible.

For EUROPEAN collections include Country if possible.

Examples: 'British (mainly Hants and Surrey); 'Australia (NSW)', 'World wide'; 'Indo-Pacific'

4PERI Period over which collection was assembled, if known.

Examples: '1870=1890', 'About 1920', 'late 19th Century'

5NUMB Size of collection. This may be estimated in any convenient way, for example number of specimens, number of drawers (if possible with dimensions), or number of cabinets, storeboxes, etc.

6ASSN 'PERSONAL NAME(S)' (q.v. in General Guidelines) of other individuals known to be associated with larger collections; names of expeditions or Institutions associated can also be recorded here. Entries should be separated by a semicolon. Only put names in this box provided at least some of their incorporated material can be identified. Names of people whose material is thought to be incorporated in a given collection, but which cannot now be identified, should normally be submitted on a separate sheet. These names will be stored in the computer file and searched for in answer to enquiries, but they will not be cross indexed in printed registers. The only exceptions would be people (eg Linnaeus) considered to be so important that the mere possibility of some of their material being present is worth publishing.

Names can be transferred from 'Possible' to 'Definite' if indicated by later research.

In dealing with very large collections (eg a principal herbarium) the following guidelines may prove helpful:-

If you can identify less than 5 specimens as being from a given collector, enter on the 'possible' list.

If you can identify between 5 and 100 specimens, enter in 6ASSN as an associated collector.

If more than 100 specimens are identifiable, treat as a separate collector for the purposes of the register.

If the ASSN list is known to be complete, add (COMPLETE) at the end.

7LØCN In the larger box give any useful additional information on the present location of the collection, ie leave blank if in 'general reserve collections'.

Examples: 'in basement', 'destroyed 1951', 'sold at auction', 'on display in Town Hall foyer'.

If the collection is maintained as a separate entity enter 'YES' in the smaller box, else leave it blank.

8ACQN Acquisition data. Give method and source (date)

Examples: 'By exchange with Glasgow Museum (1965)'
'Donated by widow (1947) acc. no.1093G'

9MSSM Give details of any unpublished RELATED DOCUMENTATION eg manuscript note books, photographs, ephemera, etc.

10LREF Give any PUBLISHED CITATIONS to the collection eg sale catalogues, scholarly papers, etc. If you know many papers have been published on the collection, you need only give a citation to a reasonably complete bibliography if one exists.

11BIØG Any biographical information known about the primary collector, other than birth or death dates which go in 1CØLL. Leave blank if the information might breach confidentiality.

Examples: Citation of published obituaries; 'well known Lakeland vicar', 'was in Indian Civil Service 1870=1895'

12MUSE Name of institution holding the collection. Enter either the full name of the institution or its MDA code.

For collections in private hands, enter name and address of collector EXCEPT WHERE CONFIDENTIALITY has been requested, when put: 'Location available from (here insert name of institution holding the information) at discretion of collector'.

13RMCØ In left-hand box put the name of the person reporting the collection.

In the centre box put the date the collection was recorded (ie date of visit if relevant)

In right-hand box put TY or TY?, FG or FG? if type or figured specimens are present or suspected. 'Types' should be interpreted in the widest sense, to mean 'any specimen known, or even suspected, of having type status at any level' (eg topotypes and homeotypes should be included).

Record on separate, specialised forms (q.v.) all available details of putative types.

14ACTN If in your opinion the collection requires any urgent conservation measures, briefly indicate here.

Example: 'cabinets on damp floor, needs raising on bricks at once to improve airflow'

15ADDN If the collection is in reasonable condition no comment is required, but if you consider conditions out of the ordinary, eg 'extra fine' or 'poor', say so here.

Give any additional general information about collection eg 'pyrite disease rampant', 'labels damp stained and difficult to read'.

If the collection is being recorded only from a published reference, put 'LIT. REF. ONLY' in this box.

16CLAS/17GCØD/18IDEN Please leave these boxes blank.

COLLECTION RESEARCH - DATA CODING FORM (C)

501

UPDATE ENTRY

1	COLL		
2	SUBJ		
3	GEOG		
4	PERI		
5	NUMB		
6	ASSN		
7	LOCN		70 *
8	ACQN		
9	MSSM		
10	LREF		
11	BIOG		
12	MUSE		
13	NMCO	* DATE	50 *
14	ACTN		
15	ADDN		
16	CLAS		
17	GOOD		
18	IDEN		

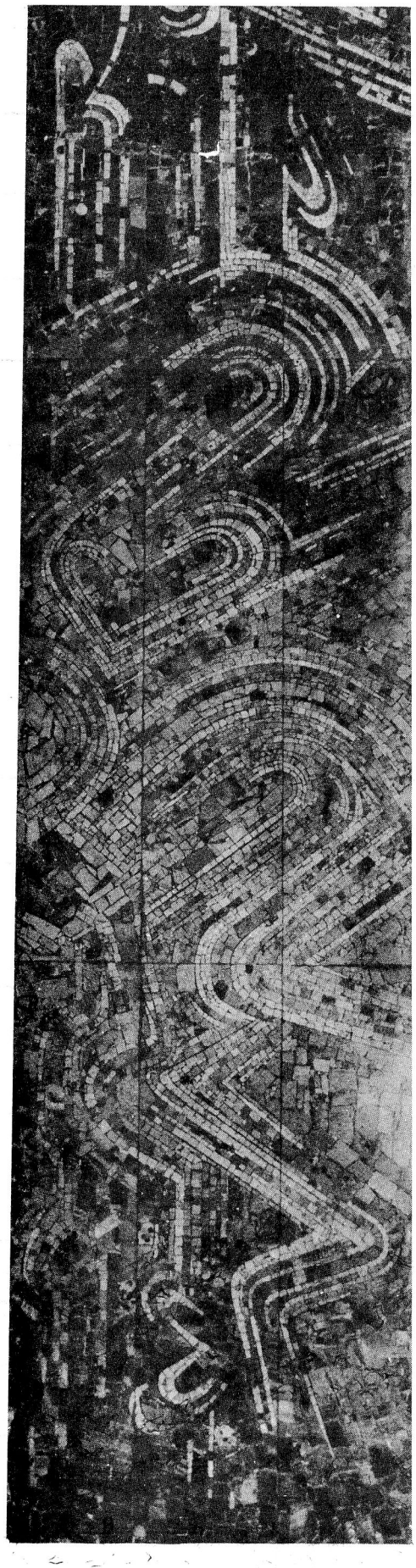
THE HUNTERIAN.

Presentation at the Hunterian

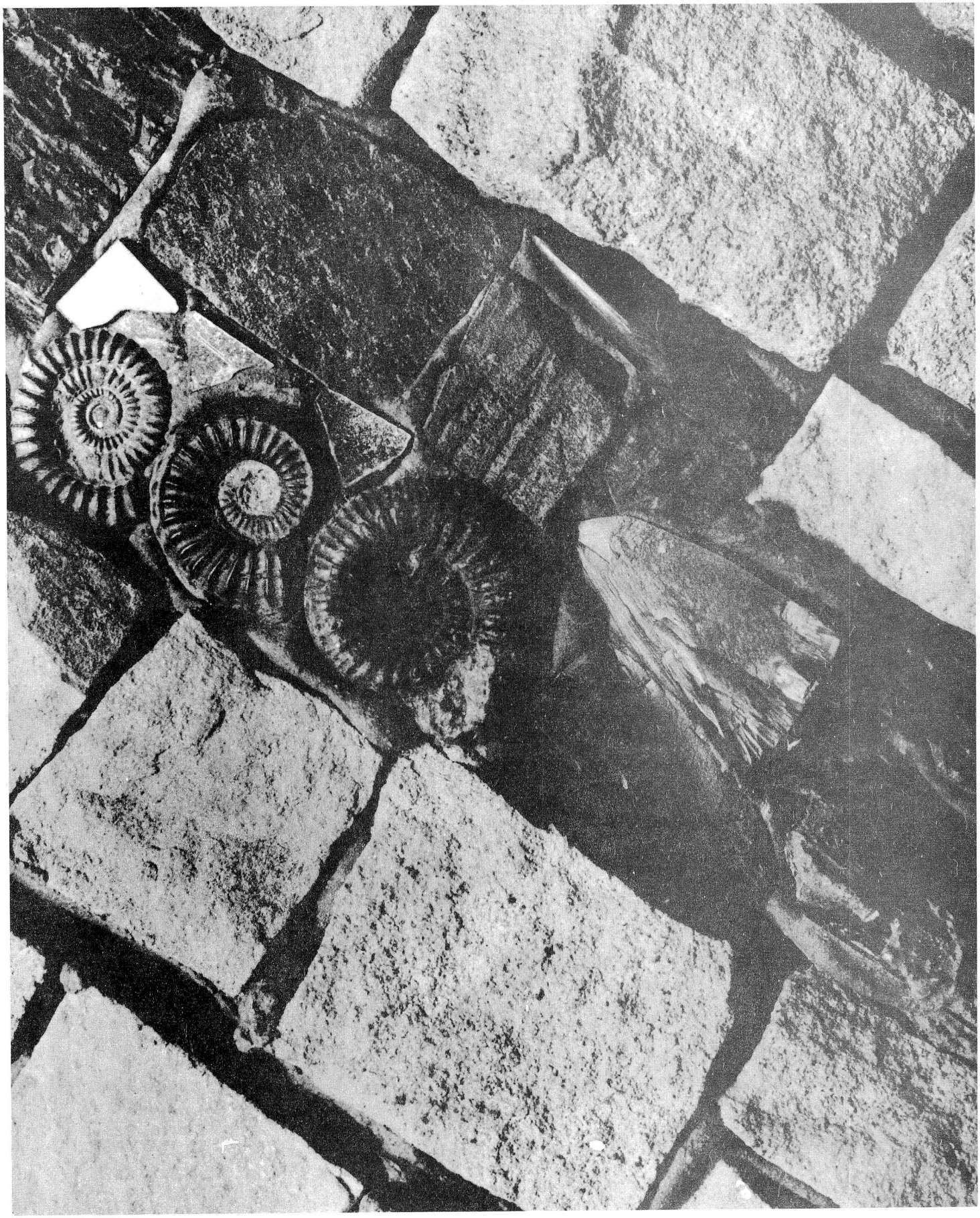
We take it that the GCG Newsletter (vol. 2 p. 412) editor's caption " 'preservation' at the Hunterian", applied to the 'Observer's fulsome Upfront article on the new Geology Department mosaic, was meant to be a wee dig at us for incorporating museum material in that mosaic? At the risk of over-reacting, may we hasten to reassure readers that this material is all either undocumented or unlocalised or, rarely, represents inferior specimens selected from large collections of similar material. Furthermore, incorporating the material in the mosaic for the foyer of the Geology Department is not a form of disposal (pace Museums Association Code of Practice), but rather an unusual method of display. The context excites closer attention from students and visitors than such specimens would receive if stored in drawers or, dare we say it, in a conventional display.

Members will have an opportunity to judge this issue for themselves, and possibly even to discuss the ethics involved, when they attend the Group's meeting on "Geology - for sale", to be held in Glasgow University Geology Department and the Hunterian Museum, on 5 December 1980.

W.E. Ian Rolfe and Graham P. Durant,
Hunterian Museum, Glasgow University



The Geology Department Mosaic



Detail from the Geology Department Mosaic at the Hunterian

WHERE IT IS NOW

GCG Newsletter Vol. 2 no. 7

The slab of Inferior Oolite from Bradford Abbas illustrated on p. 437 of the last Newsletter is in the IGS collections in London (registered no. GSM 85815). The register and labels with the specimen state that it was purchased from T.(?) Reynolds in 1885 or 1886, but the more detailed records of purchases and donations suggest that it more likely came as part of a purchase from Buckman in 1886, who may himself have acquired it from Reynolds (? formerly of London, Bristol and Yeovil).

However, since the photograph was taken, and almost certainly prior to its arrival at this museum, two of the specimens (nos. 7 and 9 of your key) have been replaced.

No. 7 "Astarte elegans var. finer ribbed" has been changed for a "Ceromya concentrica".

No. 9 "Hammatoceras nov. sp." has been changed for a "Trigonia costata".

It thus seems that Buckman thought these two forms were unusual or undescribed. Maybe they were removed (? by him) for further study and feature in his subsequent publications - possibly even as types of new species.

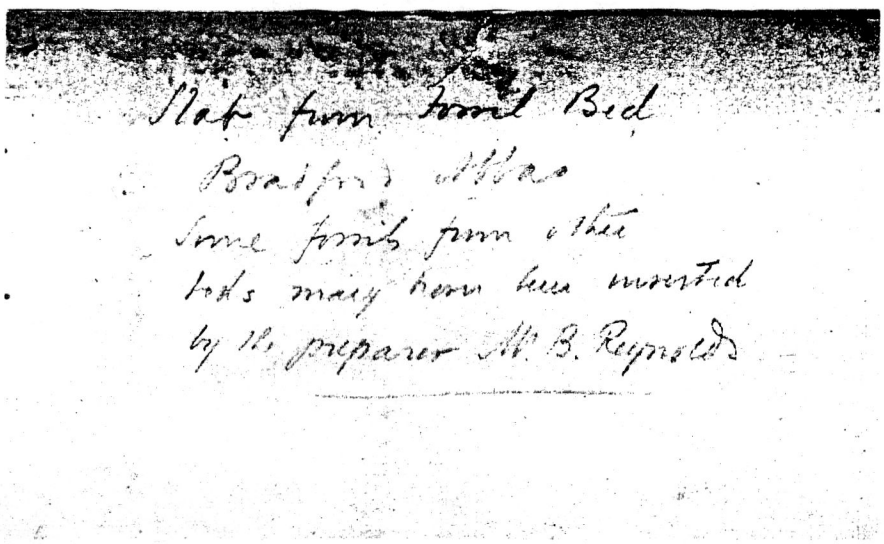
Beris Cox,
Palaeontology Department,
Institute of Geological Sciences,
Exhibition Road, London, SW7 2DE

We also have a copy of this photograph, with numbered overlay and key in S. S. Buckman's hand. The identifications given with our copy differ in minor detail from the published list. [The most important being the above mentioned no. 9 which reads

"Hammatoceras sp. nov. (Inserted) now in S.S.B. cat. (Paving Bed)"

and exactly confirms Beris' excellent suggestion]

What is potentially of more importance is a photograph of a second slab, on the back of which S. S. Buckman has written

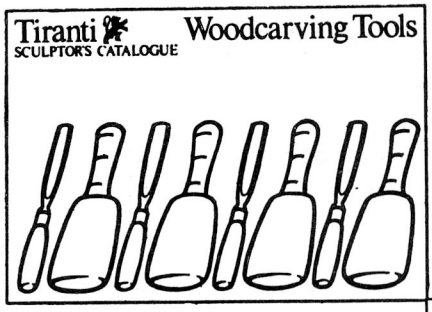


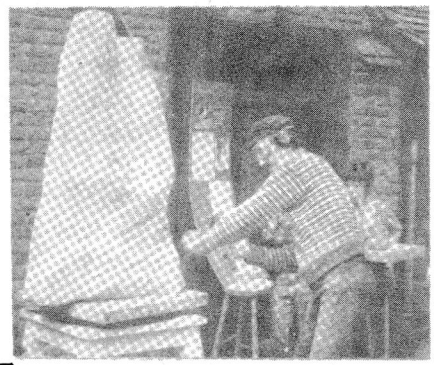
I have not identified Mr. B. Reynolds, but he may be worthy of investigation.

Both photographs are in the J. W. Tutcher Papers.

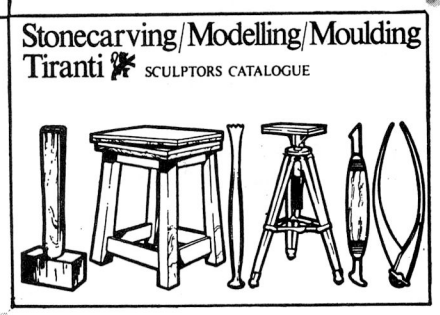
Mike Crane,
City of Bristol Museum & Art Gallery,
Queens Road, Bristol, BS8 1RL

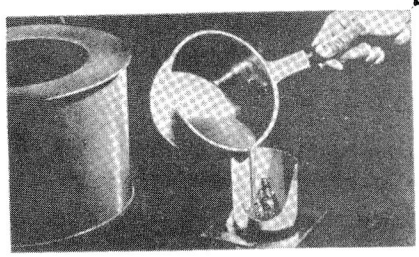
for the artist craftsman

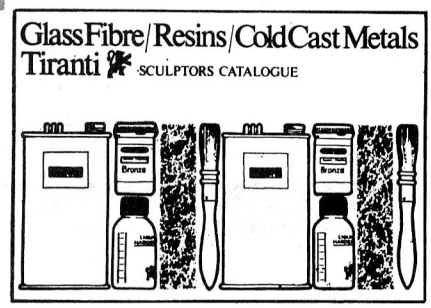




Laurence Broderick carving
Adam & Eve







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& 70 High St, Theale Berks

COLLECTIONS AND INFORMATION LOST AND FOUND

COLLECTIONS AND INFORMATION SOUGHT

86. SHORT, Rev. Jonathan (c.1826-1899)

Geoff Hancock of the Bolton Museum, Le Mans Crescent, Bolton, BL1 1SA, asks if anyone can demonstrate that Short made a geological collection of any sort as is suggested by the following obituary notice:-

> on May 17, the Rev. JONATHAN SHORT, vicar of Hoghton, near Preston, in his 74th year. He was well known as a geologist and antiquarian throughout the North of England, and has taken an active part in collecting and preserving the historical records of Lancashire.

from:- Natural Science 15, p. 71, July 1899.

87-89.

In connection with his revision and major enlargement of C. D. Sherborn's 1940 "Where is the —— Collection" Ron Cleevely of the Department of Palaeontology, British Museum (Nat. Hist.), London S.W.7, seeks information on the following geological collectors and collections:-

87. BENDALL, John (or S?) (? of Cheltenham)

Referred to in footnote p. 20 by R. I. Murchison, 1834, Geology of .. Cheltenham : "I may observe that S. Bendall, the intelligent chemical assistant in Mr. Thompson's manufactory of salts, has begun to collect in so zealous a manner, that I have little doubt he will soon add many undescribed species to our lists. His collection is open to the public".

He is probably the same man as the John Bendall mentioned on pages 37, 40 as the owner of a museum in Cheltenham from which fossils were submitted to Murchison including Ichthyosaurus bones.

88. BOLTON, John (1788-1873)

He was said to have been the first to collect fossils from Furness and to have amassed more material from the Lake District than any other person, but the whereabouts of such a collection is not known!

Obit. : Geol. Mag., 1873: 95-96.

A small collection from the Lower Silurian of CONISTON was purchased in December 1862 and is now in the collections of the Institute of Geological Sciences, London.

89. ESCHALAZ

His collection of geological material is supposed to be in Bolton Museum but any further information or confirmation is sought.

90. LAVIN's MUSEUM, Penzance

The Hampshire County Museum Service, Winchester has in its care a collection and MSS catalogue from Lavin's Museum, Penzance. The catalogue title page MSS reads "A catalogue of Cornish Minerals with their names and localities sold at Lavin's Museum, Penzance" and is further annotated "The Willis Museum, Basingstoke". Tony Cross of the Curtis Museum, Alton seeks further information about Lavin and his Museum.

see also Found section (no. 90).

91. GRIFFITH, Arthur Forster (-1933)
LOST IGUANODON FOOTPRINTS

Material donated to the Booth Museum of Natural History, Dyke Road, Brighton by Griffith in 1906 and since lost is sought by the Principal Keeper of Natural Sciences there, Charles Steel, who writes:-

"The original reference, which appears in a brief, undated (but probably 1930's) inventory of the Geological collections, reads:-

WEALDEN FOSSILS, GRIFFITH SERIES

An associated series of five footprints of an Iguanodon. These footprints were found at Jarvis Brook Waterworks, Sussex, in 1906. They are on exhibition together with a 20' plaster cast demonstrating the length of stride.

We later traced the original entry in the museum register, which is as follows:-

682 April 1906, Mr. A. F. Griffiths (sic)
Montpelier Road, Brighton

4 fossil footprints with plaster ... sub (?)
from the Wealden at Jarvis Brook Waterworks

and the following notes appear on the opposite page:-

(i) "The footprints were found at a depth of 90 feet."
(ii) Copy of letter from Dr. A. Smith Woodward (B.M.(N.H.)) 12.8.19.

"In reply to your letter today, we have labelled the casts from Jarvis Brook "Dinosaurian footprints". I think there is no doubt about that labelling, but we have been unable to decide whether the prints belong to Iguanodon or Megalosaurus".

(iii) "Also a "squeeze" in cement of a fifth footprint which was not removed from the stratum.

Our Geology Gallery, which contained the footprints and most of the collections, was dismantled in approximately 1947 and the collections put into 'store'. Between 1947 and 1972 they were moved at least twice - from one leaky building to another - the consequences of which I need hardly relate. It seems possible that the plaster cast may well have been broken up at an early stage but one would have thought that even phillistines would have kept the actual prints.
Mr. A. F. Griffith was a local naturalist and sometime chairman of the museum committee, his main interest was however entomological, although he did also present a good collection of Cambridge Greensand fossils."

A paper by R. S. Herries 1907 "Excursion to Crowborough" Proc. Geol. Ass. Lond. 20, 163-166 must refer to this material when it speaks of an iguanodont footprint being found during excavations for a waterworks at Crowborough which is said to have gone to Brighton. For biographical notices of A. F. Griffith which

may shed further light on the mystery see:

1) Anon. Brighton & Hove Herald - 12.1933.
2) R. A. Atkin. ENTOMOLOGIST 67: 48, 1934.
3) C.M. IBIS 4, 645-6, 1934.
4) Anon. Brighton & Hove Herald 4.4.1936.

Any information on this mystery will be gratefully received.

92. BAKEWELL, Robert (1767-1843)

BAKEWELL is one of the least well known, and therefore badly served, geological figures in the Dictionary of Scientific Biography. He was the author of an early, but not at first influential, An Introduction to Geology (1813) which had to be published in part at the author's own risk financially. Information is being gathered with a view to amplifying our knowledge of Bakewell's early work in geology (up to 1820), his origins and background and how and why he turned to geology late in 1810. Any information would be gratefully received to help with this study, in particular news of any of his surviving MSS and collections. I especially hope for help with three queries! Firstly, can anyone help me locate a copy of the Stevens' auction sale catalogue dated 30 May 1844 which offered for sale his collection of Fossils, Minerals, Geological Specimens and Books? Secondly one of my early notes records that his second "wife destroyed his Mss after his death". Where I got this information from I cannot now discover and hope someone can help me. Certainly, Spokes' Life of G. A. Mantell (1927, p. 153) shows that Mrs. Bakewell did not want any notices of his life and work written after his death. Thirdly can anyone lead me to any material of his collecting surviving in Museums either from before or after the above 1844 sale?

Dr. H. S. Torrens,
Department of Geology,
University of Keele,
Keele, Staffordshire ST5 5BG

93. BROCKBANK, W.

Can anyone help identify this collector, a friend or associate of W. Boyd Dawkins (1838-1929) and collector of graptolites from the Southern Uplands in the mid or late 19th Century. His material in the Manchester Museum also includes fossils from Greenock.

Dr. R. M. C. Eagar
Manchester Museum

see also Found section (no. 93)

94. CREWDSON, Mrs

Another collector of the same period (19th century) also represented in the collections of the Manchester Museum. Any information would be of interest.

Dr. R. M. C. Eagar
Manchester Museum

95. HUDLESTON, Wilfrid Hudleston (1828-1909)

Dr. Colin Forbes has put a descendant of this important palaeontologist in touch with us. Hudleston is best remembered for his palaeontological work on Jurassic gastropoda but he had early interests in ornithology as Mrs. Hudleston's letter below points out. His other interest in marine biology led to his greatly aiding the founding of the Dove marine laboratory at Cullercoats now part of the University of Newcastle-on-Tyne.

Mrs. Hudleston's letter reads as follows:

"W. H. Hudleston was my husband's Great-Uncle. Family diaries have recently been brought to our attention and revived our interest in Great-Uncle Wilfrid, especially so since we have met his grand-daughter. In his pre-geological days W. H. Hudleston - or W. H. Simpson as he was then called - was an ornithologist. His collection of stuffed birds and eggs was divided in two, one half descending down my husband's line of family. [His will dated 1908 speaks of the collection of birds at Cayton Hall to go to his brother Rev. John Henry Hudleston (1834-1912), while the collection of birds and eggs at 8 Stanhope Gardens, London with the minerals in the same cabinet as the eggs to go to his wife]. When my husband was a schoolboy of about 13 years [1927] his father died and the representative of some Museum or other either called at the house or wrote saying that 'they' had one half of the collection and could they please now have the other half. This they were allowed to do, and undoubtedly collected it. We cannot, however, trace any part of the collection. Dr. Forbes tells me that you may be able to help us with this query. He also suggests that failing this information being to hand, you might be able to publish a request for information in the Newsletter.

It would also be interesting to know of any outlying bits of his geological collection. I think first choice went to the Sedgwick, but I believe that the widowed Mrs. Hudleston [she was Rose second daughter of William Heywood Benson of Littlethorpe, Yorks. whom he married in 1890 and who survived him] was empowered to sell off or otherwise dispose of parts of the collection.

We are also trying to locate a number of missing family portraits which are thought to have been sold, along with W. H. Hudleston's portrait, about 1950. Do you by any chance know of the whereabouts of his portrait (oils, I gather)? To locate even one portrait would almost certainly give some lead on the others. I am neither an ornithologist nor a geologist, but I do find Wilfrid Hudleston, like his father, an entertaining diarist. It seems a great pity that his direct descendants do not have any portrait of him.

I shall be very grateful indeed for any information which you can let me have."

Mrs. N. A. Hudleston
Cayton Hall,
South Stainley,
Harrogate, Yorks., HG3 3LY

See also Found section (no. 95)

COLLECTIONS AND INFORMATION FOUND

14. CALLAWAY, Charles

I can contribute a little further information on Charles Callaway (GCG 1 (6) 299, and 2 (6) 352).

Charles Callaway was the first Curator of Sheffield Museum, being appointed about October 1874. However, he resigned in October 1875 on grounds of ill-health and supposed harassment by a Museum Committee member.

In September 1876, Sheffield Museum acquired from Callaway, then of Wellington, Salop, a small collection of forty fossils by exchange. These are mostly brachiopods and trilobites from the Lower Palaeozoic of Wales and the Welsh Borders. Unfortunately they contain none of the named species sought by Robin Cocks.

Timothy H. Riley
Keeper of Natural Sciences
Sheffield Museum
Weston Park, Sheffield, S10 2TP

60. SOPWITH MODELS

Professor Frank Hodson, Geology Dept., University of Southampton has kindly sent the following note.

"Inherited from the Hartley Institution, Southampton, the precursor of the University of Southampton is a set of 12 Sopwith geological models of the largest (4" x 4") size beautifully made around 1841 and still in good condition despite having been used until a few years ago, in hundreds of geological mapping classes. The set is accompanied by first (1841) edition of "Description of a Series of Geological Models etc ..." published at Newcastle-upon-Tyne (see overleaf). The models cost the Institution £5, which must be equivalent to £100 today although it would cost much more to have them duplicated by a modern cabinet maker."

82. CARRINGTON, Samuel (1798-1870)

Ron Cleevely of the British Museum (Nat. Hist.) kindly sends the following information of the whereabouts of his collections:-

London, Stratford, Passmore-Edwards Museum.
Some Carboniferous Limestone fossils acquired with H. BROWN collection,

Nottingham, Wollaton Hall [= Castle Museum].
Had fossil collection.

83. JORDAN, ?Dr. Henry Keyes (1838-1923)

Dr. R. M. C. Eagar of the Manchester Museum reports that the following information has come to light thanks to our recent appeal. The following notice is from the Journal of Conchology 1944 vol. 22 page 95. Dr. H. K. Jordan seems likely to be the man whose geological collections are (in part?) in Manchester Museum.

DESCRIPTION

OF A SERIES OF

GEOLOGICAL MODELS,

ILLUSTRATING

THE NATURE OF STRATIFICATION,

VALLEYS OF DENUDATION,

COAL SEAMS IN THE NEWCASTLE COAL FIELD,

FAULTS OR DISLOCATIONS OF THE STRATA,

INTERSECTION OF MINERAL VEINS,

&c.

BY T. SOPWITH, F.G.S.

THIS ADDITION IS TO ACCOMPANY
ANY OF THE SERIES OF GEOLOGICAL MODELS,
OR AS A SEPARATE WORK,
EXPLANATORY OF THE SEVERAL SUBJECTS
ILLUSTRATED BY THEM.

THE DIMENSIONS AND PRICES
OF THE GEOLOGICAL MODELS
ARE DESCRIBED IN THE ADVERTISEMENT AT THE
END OF THIS VOLUME.

PRICE (WHEN SOLD APART FROM THE MODELS)
THREE SHILLINGS.

DESCRIPTION

OF A SERIES OF

GEOLOGICAL MODELS,

ILLUSTRATING

THE NATURE OF STRATIFICATION,

VALLEYS OF DENUDATION,

SUCCESSION OF COAL SEAMS IN THE NEWCASTLE
COAL FIELD,

THE EFFECTS PRODUCED BY FAULTS OR
DISLOCATIONS OF THE STRATA,

INTERSECTION OF MINERAL VEINS, &c.

BY T. SOPWITH, F.G.S.,

MEMB. INST. C. E., AUTHOR OF A TREATISE ON
ISOMETRICAL DRAWING, ETC.

NEWCASTLE-ON-TYNE:

PRINTED FOR THE AUTHOR,

BY J. BLACKWELL AND CO.

Cover and title page from a first edition of "Description of a Series of Geological Models etc."

A member of this Society who passed out almost unnoticed twenty years ago was Dr. Henry Keyes Jordan, of Newport, Mon.

Born at Bristol in 1838 he spent some years in London as articled pupil with an engineering firm and by degrees became a specialist in coal mining, especially in the Forest of Dean and in South Wales where many pits were sunk under his guidance. He was a recognized authority upon the correlation of the coal seams in South Wales. In 1873 he became a member of the S. Wales Institute of Engineers and contributed many papers to its *Proceedings* on the geology of the S. Wales coalfield.

For one of these papers he received the first gold medal ever awarded by the Institute, and in 1922 was made an Honorary Member. He was elected a Fellow of the Geological Society in 1865, and in 1916 was granted the Honorary Degree of D.Sc. by the University of Wales. He was greatly interested in the National Museum of Wales and a frequent benefactor.

In addition to his geological work Jordan was intensely interested in recent British marine mollusca and amassed a very fine collection which eventually passed into the writer's hands. He did an immense amount of dredging, and used to claim that he had dredged in all the British estuaries from Cornwall to Orkney. His collection was noteworthy for particularly fine specimens of their kind, and his favourite group was the Buccinidae.

He wrote very little on the mollusca, and I only recollect two papers—one in this *Journal*, vi, pp. 225–239, on British Species and Varieties of *Fusus*, and the other in *Pr. Malac. Soc. London*, i, pp. 264–9, pl. xvi, on Some New Brit. Mollusca.

He died on 31st December, 1923. J.R. le B. TOMLIN

90. LAVIN, John (-1860)

Peter Embrey's new edition of the "Manual of the Mineralogy of Great Britain and Ireland by Greg and Lettsom 1858" published in 1977 by Lapidary Publications gives the following information on John Lavin p. xxi.

"John Lavin died 1860. Stationer and mineral dealer of Chapel Street Penzance from 1847 or earlier. Fine specimens from West Cornwall also from abroad brought home by Cornish miners. "Not averse to preparing or selling faked specimens". Collection and stock bought by Baroness Burdett-Coutts from his son in 1863 much of which was later acquired by Sir Arthur Russell."

93. BROCKBANK, William (1830-1896)

We have sought information about Brockbank before (GCG 1 (8) 427 1976) when we reported some of his graptolites at Bolton Museum.

His connection with Manchester is by residence since he lived at Brockhurst, Didsbury near Manchester. His career can be summarised by the following notices:-

WILLIAM BROCKBANK died on September 18, 1896, in the sixty-seventh year of his age. Eldest son of Mr. W. Brockbank, who executed numerous important engineering works in the Manchester district, he served his apprenticeship with Mr. Thomas Carrick, then a well-known surveyor, with whom, in 1853, he entered into partnership. The firm of Carrick & Brockbank, of which he was senior partner at the date of his death, had a large practice in surveying for railways and water-works. Mr. Brockbank was a justice of the peace for Cumberland, Fellow of the Geological Society, and was elected a member of the Iron and Steel Institute in 1872.

Journal of the Iron and Steel Institute, vol. 50, page 257, 1897

WILLIAM BROCKBANK was born in 1830 near Manchester (?) and followed the profession of his father, a civil engineer. His delight was in his garden at Brockhurst, Didsbury. He published few strictly botanical papers, though several times he entered into discussions on gardening topics; his contributions to the Manchester Literary and Philosophical Society were chiefly on botanical and geological points. He died on 25th September, 1896, at Didsbury, and was buried in the grounds of the Friends' Meeting House at Ashton-on-Mersey. He became a Fellow of this Society 20th March, 1884, and was a Fellow also of the Geological and Royal Horticultural Societies.

Proceedings of the Linnean Society of London, 1896-97, p. 57

Other notices appear in the following journals:-

Garden, vol. 50, p. 282, 1896.
Gardeners Chronicle, vol. 2, p. 409, 1896.
Gardeners Magazine, p. 684, 1896.
Trans. Liverpool Bot. Soc., p. 62, 1909.

H. S. Torrens

'William Brockbank was born in Manchester, son of an engineer involved with the construction of the Manchester and Liverpool Railway, which was opened in 1830. Details of his life are given in Mem. & Proc. Manch. Lit & Phil. Soc. 42 (1897-8), Annual Report to the Council, p. xlvii. Brockbank a wealthy amateur, collected extensively both rocks and fossils in Scotland, and wrote a few papers in the Manchester Proceedings on geological topics. He was particularly interested in glacial geology and "rescued several important erratics from destruction", many being placed in his very fine garden at Brockhurst, Didsbury, Manchester. He was Vice-President of the Glacialists' Association.

Most of the Manchester Museum Brockbank material consists of graptolites from the Southern Uplands of Scotland and was received after his death through W. Boyd Dawkins. I understand that there is also Brockbank material at the Royal Scottish Museum. I am much indebted to his grandson, Dr. William Brockbank of the John Rylands Library and Mr. Horace Hayhurst of Manchester Literary and Philosophical Society, who both helped me track down this collector.'

Dr. R. M. C. Eagar who traced this information after his appeal had reached us.

95. HUDLESTON, Wilfrid Hudleston (1828-1909)

Hudleston's fossil collections were very important and of some size as he purchased the Jurassic mainly gastropod collections of Darrel Stephens, Alexander William Griesbach and Sydney Savory Buckman (1860-1929) to add to his own. In connection with the latter the following letter of 24 August 1885 in the Buckman family papers seems worth putting on record here with grateful acknowledgement to Peter Buckman the present owner.

"Dear Sir,

In reference to my collection of Fossil Gasteropoda of all kinds which you saw the other day. I value these at one hundred guineas. The Inferior Ooolite collection consists of upwards of 220 species and contains over 1500 good well preserved specimens. Considering that these all come from the Inferior Oolite of Dorsetshire (and a small portion of Somersetshire) it must be more valuable than a collection of the same number of species containing the common forms of two widely different localities say Dorset and Gloucestershire. The collection is the result of 25 years work. The Great Oolite and Lias collections are small. They contain

Lias about 35 species - 113 specimens
G. Oolite etc. 16 species - 29 specimens

If however you preferred it I would sell all the collections at so much each good specimens i.e. per head. Kindly let me hear your opinion.

Yours faithfully

(S. S. Buckman)

W. H. Hudleston Esq., F.R.S. F.G.S. etc. "

Sherborn, C. D. 1940 "Where is the —— Collection" p. 71 notes W. H. Hudleston's collection was split between the Sedgwick Museum, the British Museum of Natural History and Bedford College London (in 1921 passed to Museum of Practical Geology). The collection he made jointly with Edward Wilson is in Bristol City Museum.

Cox, L. R. and Arkell, W. J. 1948-50 "A Survey of the Mollusca of the British Great Oolite Series" Pal. Soc. Monograph p. xxii add that a further part went to Bristol University.

Dr. Ian Rolfe earlier reported (GCG Newsletter 1 (3), p. 152, 1975) that the Hunterian Museum, University of Glasgow had about 3200 of Hudleston's specimens purchased in 1921 through Dr. Catherine Alice Raisin (1855-1945), and that 2700 were catalogued in one of Hudleston's MSS with the collection.

His obituarist (Geol. Mag. (5) vol. 6, p. 144, 1909) also speaks of his work for and donations of fossils to the Dorset County Museum.

From this, while it is certain that the Sedgwick Museum had the most important part of the collection, the remainder was widely spread, obviously through the influence of Dr. Raisin head of Geology at Bedford College for Women, London from 1890 to 1920, who was nicknamed "The Sultana" by her devoted students [Proc. Geol. Assoc. 57 pp. 53-54, 1946]. She was the first female head of a geology department in Britain and one presumes a friend of Hudleston.

Any information about Hudleston collections, portraits or manuscripts will be gratefully received.

H. S. Torrens

BRITISH NATURALISTS: A PANEL FOR ENQUIRIES.

The Society for the Bibliography of Natural History has organised a panel of referees prepared at least to try and assist with queries about Naturalists in the British Isles.

The persons listed below (not necessarily members of the Society) have kindly agreed to do their best to answer reasonably undemanding queries on individual naturalists in the categories referred to. They do not necessarily themselves have an expert knowledge of the topic in question, in some cases they merely happen to be well placed for access to a special store of biographical data or are willing to act as a point of first reference, passing on queries to appropriate quarters. Where more than one name appears the order is simply alphabetical and each person should be regarded as equally available for consultation.

Members who come by information of unusual interest through this means are urged to contribute a note on it to the Society's Newsletter published by the Society per Mrs. Susan Thackray, c/o British Museum (Natural History), Cromwell Road, London, SWY 5BD. Besides making that publication even more effective, this will help to indicate how far the Panel is proving of value and may stimulate others to put it to use.

The coverage of the Panel is as yet far from comprehensive. In particular the section relating to Scotland (which will be by faunal areas) has had to be held over till the next edition - which for this reason will not be long delayed. Any offers to act for categories not yet covered, or suggestions for likely people who might be approached in this connection, will be gratefully received for consideration by the committee. Please send these to:
D. E. Allen, Lesney Cottage, Middle Road, Winchester, Hants.

1. Naturalists associated with particular areas of the British Isles

Unless otherwise indicated ('bot', 'geol.', etc.) those listed below are willing to respond to queries on naturalists of all kinds relating to the area in question. Counties referred to are the traditional, Watsonian, botanical entities - not the now often very different namesakes produced by the local government reorganisation of the last few years.

Somerset, Gloucestershire - Dr. M. D. Crane, City of Bristol Museum and Art Gallery, Queens Road, Bristol, BS8 1RL.
Wiltshire - P. J. Dillon, Monkton Lea, Winterbourne Monkton, Swindon, Wilts., SN4 9NW (bot., zool.); Dr. H. S. Torrens, Dept. of Geology, The University, Keele, Staffs., ST5 5BG (geol.)
Dorset - Dr. H. S. Torrens (geol.)
Hampshire - D. E. Allen, Lesney Cottage, Middle Road, Winchester, Hants., SO22 5EJ.
Isle of Wight - B. Shepard, 87 Elm Grove, Newport, IOW PO30 1RN (bot.).
London - D. H. Kent, 75 Adelaide Road, London, W13 9ED (bot.).
Essex - R. H. Mays, Barnard's Farm, Debden Green, Saffron Walden, Essex (ent.).
Leicestershire and Rutland - I. M. Evans, Leicestershire Museums & Art Galleries, 96 New Walk, Leicester, LE1 6TD.
Lincolnshire - Dr. M. R. D. Seaward, School of Environmental Sciences, The University, Bradford, BD7 1DP.
Lancashire - Mrs. B. D. Greenwood, Dept. of Botany, Merseyside County Museum, William Brown St., Liverpool, L3 8EN (bot.).
Yorkshire - Dr. M. R. D. Seaward.

Northumberland and Durham - P. S. Davis, Dept. of Natural Sciences, Sunderland Museum, Borough Road, Sunderland, Tyne & Wear, SR1 1PP.
Isle of Man - D. E. Allen.
Wales - R. B. Davies, 'Sisial Nant', 2 Maesyfelin, Penrhyncoch, Aberystwyth, Dyfed, SY23 3EN; G. Ellis, Dept. of Botany, National Museum of Wales, Cardiff, CF1 3NP (bot.); Dr. D. A. Bassett, Director, National Museum of Wales (geol.).
Ireland - Dr. E. C. Nelson, National Botanic Gardens, Glasnevin, Dublin 9 (bot.); D. M. Synnott, National Botanic Gardens, Glasnevin (bryol.); Prof. G. L. Davies, Dept. of Geography, Trinity College, Dublin 2 (geol.); Dr. D. Goodhue, Dept. of Zoology, Trinity College (zool.).

2. Naturalists associated with particular fields

Botanists:	Phanerogamists	- D. E. Allen
	Bryologists	- Dr. G. C. S. Clarke, Dept. of Botany, British Museum (Natural History), Cromwell Road, London, SW7 5BD.
	Lichenologists	- Dr. M. R. D. Seaward.
Horticulturalists		- R. G. C. Desmond, 79 Ennerdale Road, Kew, Richmond, Surrey.
Entomologists:		
	All groups	- Miss P. Gilbert, Dept. of Entomology, British Museum (Natural History).
	Coleopterists	- Dr. M. Darby, 52 Avenue Gardens, London, W3 8HB.
	Dipterists	- K. G. V. Smith, Dept. of Entomology, British Museum (Natural History).
Conchologists		- D. Heppell, Dept. of Natural History, Royal Scottish Museum, Edinburgh, EH1 1JF; Mrs. N. F. McMillan, The Nook, Uplands Road, Bromsborough, Merseyside, L62 2BZ.
Ichthyologists		- A. C. Wheeler, Dept. of Zoology, British Museum (Natural History).
Marine biologists		- Prof. E. L. Mills, Dept. of Oceanography, Dalhousie University, Halifax, Nova Scotia, Canada, B2H 4J1.

FOSSILS FROM LYME

The 'duteous toils' of Lyme's two contemporary collectors, David Costain and Peter Langham, have resulted in some fine vertebrate fossil finds this year. They have very kindly offered to loan the Museum the most remarkable: a nearly complete Plesiosaur. 'Plesios' are always much rarer than "Ichthyos" here. The present specimen is much disarticulated, but full of fascinating detail, including some ferocious teeth. It is too large for us to get into the Fossil Gallery, so we hope to mount it in the cellar, now in process of refurbishment. I must also thank the two for their continuing loan of one of their beautifully prepared Ichthosaurs - the other, alas, has gone away for academic study; but they kindly replaced it by a remarkable fish fragment, with lifted scales, and a superb tenuirostris rostrum - the snappers of the long-beaked "fish-lizard".

I should add that a major conference in London last year brought some much-needed sense into the fossil 'problem'. It was generally agreed that with coastal sites like Lyme, where the eternal worst destroyer of specimens is the sea, the presence of expert professional collectors, who can retrieve the kind of material beyond amateur powers or skills, was desirable; and also that such sites had a valuable teaching function for school parties and the like. An impression seems to have gone round the academic world during this century that Lyme is 'exhausted' as a major vertebrate fossil site. I think the town does not fully realize how much it owes to our two friends above, and of course Brian Langdon and his splendid exhibition, for proving that theory total nonsense during these last few years.

From the Curator's Report of the Lyme Regis Museum by John Fowles, 1979.

TECHNICAL

THE BURNT DOPE TECHNIQUE

AND OTHER INTERTIDAL PLOYS FROM AMERICA

Most vertebrate fossil collecting takes place under conditions that are extremely dry (as in the Wild West) or extremely wet (as in Florida springs). For these circumstances ingenious collectors have, over the years, developed techniques for cementing and solidifying the bones so that they can be extracted and transported with a minimum of damage. A rather different methodology, however, has had to be developed by those of us who collect as beachcombers, prospecting the intertidal zone --- what Marlow called

> "...that uncertain shore
> That is nor sea nor land,
> But changeth as the ocean ebbs and flows."

The bone-bearing formations of the intertidal zone may be well consolidated, like the soft reddish-brown sandstones of the Triassic around the Bay of Fundy in Nova Scotia, or they may be unconsolidated like the Cretaceous greensand in the banks of the Chesapeake and Delaware Canal in Delaware. In either case the fossils will seldom be dry enough to be handled by the techniques familiar to arid-country collectors: they will be damp at best and sopping wet at worst.

An additional complication, and one which gives intertidal collecting its sporting character, is the time factor. If fossils exposed by the ebbing tide are given a chance to dry in the sun, it inexorably follows that the tide will be coming in while the work of excavation is going on. Even if a bone can be extracted before Neptune takes it again to his bosom, the collector always runs the risk of having to make his escape by wading around the point or climbing the cliff.

Around the Minas Basin (the cul-de-sac of the Bay of Fundy) the usual differences between low and high tide is about 40 feet, and we have experienced (as Jerry Case can testify) tides as high as 48 feet. As a result the collector is always digging faster than prudence would dictate, always tempted to take shortcuts as the wavelets ripple closer and closer to his feet.

For consolidating damp specimens the intertidal collector's salvation is the Burnt Dope Technique invented by Stan Olsen ---excuse it, Professor Stanley J. Olsen ---a former preparator who has ascended to higher rungs of the scala naturea. Because it has been published only in an out-of-the-way place (Carroll et al., 1972, p. 24-25) this technique is still unknown to many who might profit by it. In essence it consists of applying cellulose cement ("dope") in the usual dry-country manner and then flaming off the solvent.

Any acetone -or alcohol-based cement can be used: Duco, Alvar, Ambroid, or celluloid dissolved in acetone. The trick, as experienced collectors know, is to make the dope thin enough -- "the consistency of Drambuie but twice the proof" is a good rule-of-thumb. This elixir is applied liberally to the specimen and surrounding matrix with a medicine dropper or squirt-bottle. A small lighter-fluid can with a swivelling plastic nozzle is also handy, but keep a couple of glass-headed basting pins in your lapel to clear the nozzle when it clogs. A match is then applied to the surface, and an old felt hat is clapped over the little blaze to protect it from the Fundy breeze until it burns itself out. (Small charred areas only make my 60-year-old field hat look more picturesque. NB, a straw hat is not recommended for this operation.)

In most cases two or more applications and burn-offs will be required. Caution: any projecting corners and edges of bone may char in the flame if not protected. This burning operation helps to dry the surface and leaves a skin of cement that helps to hold the specimen together while it is being extracted. Moisture will of course make the cellulose turn white, but its transparency can be restored in the laboratory by applying acetone under a heat lamp.

After being doped, the specimen is isolated by trenching and extracted in the usual manner. If circumstances require it and the advancing tide allows enough time, plaster-jacketing is in order. In Nova Scotia, however, our usual practice is to omit the jacket and simply pop the bone out in a block of matrix by insinuating an oyster-knife under it. (The oyster-knife --in effect a thin-bladed chisel with a temper mild enough to leave it flexible but not brittle--is such a superior collecting tool that I'm surprised more field men don't use it. Besides being useful for trenching in soft sandstone, it is invaluable for splitting slabs without fracturing them.) The damp block is then wrapped tightly in paper towelling and cinched with sticky tape or postal rubber bands. Specimen and matrix tend to be friable when wet but they gain strength as the package dries.

And now a word about plaster. Complaints are heard that the old collector's standby, molding plaster, is becoming increasingly hard to obtain even in cities, much more so in the boondocks. This problem seldom arises in gypsum-rich Nova Scotia where all kinds of plaster are manufactured locally, but still it sometimes happens that the only plaster available is the slow-setting type used for finishing walls. Dry-gulch collectors who find themselves in this predicament can accelerate the setting time by adding salt to the water. In Nova Scotia, however, an unlimited supply of pre-salted water is delivered free to our collecting sites by Davy Jones. This obliging service compensates a little for the fact that Davy Jones has usually stolen the best fossils, or the best parts of them, before we get to the outcrop.

REFERENCE

Carroll, R.L., et al., 1972. Vertebrate paleontology of eastern Canada. Field excursion A59 guidebook, XXIV International Geological Congress, Montreal, 113 pp.

Donald Baird
Museum of Natural History
Princeton University
Princeton, New Jersey
08540

This article was first published in "The Chiseler" Vol. 1 No. 2, July 1978 whose Editor, Allen D. McCrady of Pittsburgh Pennsylvania, we thank for permission to reproduce.

COMPUTER CONTROLLED DATA BANK SYSTEM AT THE HANCOCK MUSEUM.

In the last issue, G.C.G. 2 No. 7, an article appeared under the above heading by Susan Turner and Peter Robson, discussing the use of SPIRES (Stanford Public Information and Retrieval System). Since then they have kindly forwarded these examples to illustrate and augment this article.

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MUSEUM REGISTRATION NUMBER: M13o7
   CATALOGUE:                MINERALo

   MINERAL NAME:             GOLDo
   FORM:                     NATIVE, DODECAHEDRA AND ABUKESCENTo
   CHEMICAL FORMULA:         AU
   KEY NUMBER:               1o4
   ASSOCIATED WITH:          QUARTZo

   LOCALITY:                 ABRUDBANYA, TRANSYLVANIAo
   PERIOD:                   NOT RECORDEDo
   HORIZON:                  NOT RECORDEDo

   COLLECTED BY:             Po WALTHERo

   MISCELLANEOUS COMMENTS:   RECORDED BY Jo MENNEAR FEB 1977o

****

GR02o09   ROCK NAME: COALo
          LOCALITY: AFRICAo
          COLLECTOR: DRo BRANAND TEMPERLEYo
          AGE: NOT RECORDEDo NOT RECORDEDo

****

GR00o92   ROCK NAME: COALo
          LOCALITY: CONSETT COLLIERYo
          COLLECTOR: Jo CAYGILLo
          AGE: CARBONIFEROUSo COAL MEASURESo

****

GR00o91   ROCK NAME: COALo
          LOCALITY: CONSETT COLLIERYo
          COLLECTOR: Jo CAYGILLo
          AGE: CARBONIFEROUSo COAL MEASURESo

****
G62o59    TRILOBITE...
****
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ARTHROPODA, TRILOBITOMORPHA

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MUSEUM REGISTRATION NUMBER: G62o59
   CATALOGUE:                FOSSILo

   FOSSIL NAME:              TRILOBITEo
   PHYLUM:                   ARTHROPODAo
   OTHER TAXA:               TRILOBITOMORPHAo

   LOCALITY:                 ELF HILLSo
   PERIOD:                   CARBONIFEROUSo
   FORMATION:                COAL LSTo

COLLECTED BY:                SIR WoCoTo
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                MUSEUM REGISTRATION NUMBER: C01o02
                   CATALOGUE:               CASTo

                  FOSSIL NAME:              MESOSAURUS TENUIDENS GERVAISo
                   PHYLUM:                  CHORDATAo
                   OTHER TAXA:              REPTILIAo

                  LOCALITY:                 GRANGE, 60 MILES S OF KIMBERLEY SoAFRICAo
                   PERIOD:                  LoPERMIANo
                   HORIZON:                 WHITE BAND, UPPER DWYKAo

                  MISCELLANEOUS COMMENTS:   ON DISPLAYo


MUSEUM REGISTRATION NUMBER: AGL1240
   CATALOGUE:               FOSSILo

   FOSSIL NAME:             LURYSTOMA ANGULARE, LONGo
    PHYLUM:                 o
    DESCRIPTION:            LONGITUDINAL SECTIONo

   LOCALITY:                ABOVE HUTTON MILLo
    GENERAL GRID-REFERENCE: VC81o
    PERIOD:                 o
    HORIZON:                o

   COLLECTED BY:            AoCoLONGo


 MUSEUM-NUMBER = G148o57;
 CATALOGUE = FOSSIL;
 LOCALITY = KENTS CAVE;
 GEOL-HORIZON = AURIGNACIAN PLEISTOCENE;
 PERIOD = QUATERNARY;
 MISCELLANEOUS = ON DISPLAY ICE AGES;
 FOSSIL-DETAILS;
 FOSSIL-NAME = HOMO SAPIENS;
   PHYLUM = CHORDATA;
   OTHER-TAXA = MAMMALIA,PRIMATE;
END;

    SITE-NUMBER = NT81/05-Co                    LOCALITY = RAKER CRAGo

    GENERAL GRID REFERENCE = NT81o              SPECIFIC GRID REFERENCE = NT849103o

    TYPE OF SITE = UPLAND CRAGSo                SITE CONDITION = A CLEAR AND OUTSTANDING FEATUR

    GEOLOGICAL VALUE OF THIS SITE = HIGHo       FAULT AND/OR FOLD FEATURES: INTRUSION ALONG A
                                                    MAJOR CRUSH ZONEo
```

SAMPLES COLLECTED: PHOTOGRAPHED.

VISITING GEOLOGIST : P.G.ROBSON. DATE OF VISIT WAS JULY 1977.

ADMINISTRATIVE DISTRICT WITHIN THE (OLD) COUNTY OF NORTHUMBERLAND = ALNWICK.

ACCESS-OWNER DETAILS OF SITE: ACCESS IS WITH EASE FROM THE ROAD. THE COQUET HAS TO BE CROSSED, WHICH MIGHT BE DIFFICULT WHEN RIVER IS HIGH.

MISCELLANEOUS COMMENTS RELATING TO THIS SITE: THE BEST EXAMPLE OF A SILICEOUS VEIN IN THE CHEVIOTS, FORMING A CONSPICUOUS RAMPART TRENDING UP THE SOUTHERN SIDE OF THE COQUET VALLEY. FEATURE IS ABOUT 3 METRES WIDE, AND UP TO 2 METRES HIGH. POSSIBLE THREAT FROM ADJACENT FORESTRY - ' ENCROACHMENT BY ADJOINING FORESTRY SHOULD BE DISCOURAGED' - A. LUNN.

---- ROCK DESCRIPTION --

ROCK NAME OR TYPE : SILICEOUS VEIN. AGE: LOWER OLD RED SANDSTONE.

LITHOLOGY: THE RESULT OF SILICA-RICH SOLUTIONS PENETRATING WHAT MAY HAVE BEEN A PRE-EXISTING SHATTER BELT. MOVEMENT ALONG THIS BELT MAY HAVE OCCURRED. AT THE TOP OF THE HILLSIDE, VEIN MATERIAL CAN BE SEEN TO PENETRATE THE SURROUNDING LAVAS. THE QUARTZ IS OFTEN STAINED WITH HEAMATITE, OR IN ASSOCIATION WITH THIN STRINGS OF IT. IT IS THOUGHT THAT THESE SILICEOUS VEINS MAY REPRESENT THE LAST PHASE OF THE LOWER ORS IGNEOUS ACTIVITY. THIS FEATURE CAN BE PICKED UP IN THE COQUET WITH CAREFUL EXAMINATION.

-+-

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END OF FILE

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C.G.S.D.

C.G.S.D. would like to thank staff of the Geological Locality Record Centres who have returned their 1979 Annual Report Questionnaires. The questionnaires are at present being collated in order that a resumé of progress of the National Scheme will appear in M.D.A. Information and G.C.G. Newsletters in the near future.

Record Centres and Recording Units should now have received their copy of the Geology Locality Card Instructions kindly published and distributed by M.D.A. We hope that this long awaited instruction booklet will answer most of your recording problems. Further advice and recommendations on the organisation of records, sources of Information, Indexing, Confidentiality, Output and other relevant information will shortly be available in the equally long awaited Geological Record Centre Handbook also to be published by M.D.A.

Finally we also wish to record our heartfelt thanks to M.D.A. for coming to our rescue and helping the National Scheme through a difficult period.

Mick Stanley
City of Kingston upon Hull
Museums and Art Galleries

The Educational Use of Geological Sites

The National Scheme for Geological Site Documentation provides the means to encourage teachers to make use of the most suitable fieldwork sites. This fulfills the need to divert attention away from over-used and sensitive sites but at the same time is an opportunity to use sites which are more valuable for teaching.

Each recording centre will need to identify sites suitable for educational use, select the most useful, and develop their use by teachers.

1) Identification of suitable sites
An initial selection of sites can be based on - ease of access.
- safety.
- low conservation need.

2) Selection of most useful sites
The national scheme asks for a brief apraisal of the educational use of sites but this is hardly sufficient information and may be based on an opinion given by someone who is not involved in teaching. There is a clear need for recording centres to consult teachers* and their advice should preferably be based on experience of using sites.

*The Association of Teachers of Geology can help by providing the names of local teachers who may be able to help. There are a number of local groups of the A.T.G. who could be particularly useful.

There are a few general differences between the needs of various types of educational parties.

Primary and lower secondary (or middle) school children are particularly interested in collecting specimens and they are usually mainly interested in fossils. The teaching staff involved are unlikely to be trained in geology. School timetables and transport costs often mean that numbers

are up to 60 or 70 children on each visit. Such large numbers require not only large sites but groups need to be well prepared and well directed to ensure that children know what they are to do and have plenty of work.

Upper secondary school groups are less likely to be so large and more often up to 15 in number. The teachers are more likely to be geologically trained. Although the children are still likely to want to collect specimens, they are usually required to collect information in terms of measuring bed thicknesses and structures, or to make field sketches. Teachers therefore are usually interested in sites with good exposures of large scale structures which cannot be seen at first hand in school. This age group contains a vandalistic element.

3) Development of use of sites

The first need is to make information of the selected sites available to teachers. Photocopies of recording cards or sheets are unlikely to provide all the information required and could contain confidential or restricted details. We have a number of duplicated sheets for sites which are available to teachers and the general public. They provide details of access and a description of the basic geology, together with references and some indication of the main interest of the site. Conservation risks should be made clear, whether geological, biological or historical.

A more positive approach is to organize guided visits for teachers. These can be arranged through Teacher's Centres or L.E.A. advisers. At Bristol Museum we arrange a regular programme of up to 5 fieldwork visits for local geology teachers each term. These approved "in-service" courses normally take place on school days. They involve an examination of the geology of a site as well as investigating its educational potential.

We are currently extending this development of organizing a group of teachers who are writing resource packs of booklets, worksheets and slides about a few prime educational sites. These will be published by the Avon L.E.A.

I would urge all my colleagues in recording centres to liaise with teachers in order to develop the best educational use of their local sites. This should help in the management of the conservation of sites as well as helping the improvement of fieldwork education in geology.

I would be pleased to pass on copies of information sheets, details of teacher's courses or give any other help that I can.

Andrew Mathieson
Assistant Schools Organiser (Geology)
City of Bristol Museum and Art Gallery

*A.T.G. has recently established a working party to promote better educational use of sites and hopes to publish fieldwork guides for teachers.

Andrew Mathieson is a member of the working party and Assistant Editor of "Geology Teaching" (A.T.G.) and would welcome information on educational use of sites from Record Centres.

[What about University and Polytechnic teaching needs? Ed.]

NOTES AND NEWS

Radioactive Minerals

To date, only Sue Turner at The Hancock Museum has corresponded on this matter following a visit from the Radioactive Safety Officer of the University. Concern about a new display of potentially dangerous minerals was alleviated on the advice that a slightly thicker than normal sheet of glass or lead glass plus a wooden framework to the case would protect the visitors from nasty emissions.

Radioactive minerals in the Reserve Collection, have been put in a large, red, locked wooden box suitably marked!

Philatelic Palaeontology

An interesting selection of postage stamps depicting subjects of geological interest can be found in "Decorative and Symbolic Uses of Vertebrate Fossils" by K. P. Oakley in a publication by the Pitt Rivers Museum, Oxford, number 12 in their series titled "Occasional Papers on Technology".

Plates VI, VIII and X show fossil reptiles and amphibians from places like China and Angola and fossil mammals from Romania and Poland.

I am sure someone must have come across other branches of geology on stamps. In retrospect, our own Post Office issue stamps for all sorts of commemorations and surely there are suitable Geological Anniversaries that could be similarly ranked - ideas please and perhaps we can get our geology recognised worldwide.

GCG Literary Supplement

The following two passages have been submitted by members - can you name the novels where they originated?

1. "The idea is to see Europe casually, you know, sort of vaguely, out of the corner of the eye. All Baedekers and Michelins and museum catalogues immediately discarded as too boring and too corny. Who wants to see a pile of old stones anyway? The general 'feel' of the country is what she's after".

2. "His choice was easy; he would of course have gone wherever Ernestina's health had required him to, but it must be confessed that the fact that it was Lyme Regis had made his premarital obligations delightfully easy to support. Stonebarrow, Black Ven, Ware Cliffs - these names may mean very little to you. But Lyme is situated in the centre of one of the rare outcrops of a stone known as blue lias. To the mere landscape enthusiast this stone is not attractive. An exceedingly gloomy grey in colour, a petrified mud in texture, it is a good deal more forbidding than it is picturesque. It is also treacherous since its strata are brittle and have a tendency to slide, with the consequence that this little stretch of twelve miles or so of blue lias coast has lost more land to the sea in the course of history than almost any other in England. But

its highly fossiliferous nature and its mobility make it a Mecca for the English palaeontologist. These last hundred years or more the commonest animal on its shores has been man - wielding a geologist's hammer."

A prize awaits the person sending the first correct answers and who can also provide a further extract with geological overtones!

Whats in a Name?

The committee have been endeavouring to find a new title for the Newsletter in an attempt to boost sales to libraries. It appears that the suggestion of "Brian's Pages" failed to receive Editorial approval.

[As did "The Cross Patch" for this column fail to meet with Tony's approval. Ed.]

Brighton Rock

The Booth Museum of Natural History has been undergoing extensive re-modelling of the working areas to bring the taxidermy and geological laboratories, the Library and offices up to modern standards. More space should become available soon which will give better access to the geological collections - a point raised by students on a Museums Diploma Curatorial course not a million years ago!

The Ecology of Fossils - An illustrated guide

I have not yet received my copy of this notable book which is not, so I understand, a conventional text. According to one reviewer nor is it an exciting text despite the inspiration of the illustrations. It has also filtered through that the proof reading was not all that it might have been, so I shall keep a look out (or watch my step!) for the Manurian Marine Horizons of North Western Europe referred to on page 174.

Edited by W. S. McKerrow (1975) Duckworth
0 7156 0944 0. 384 pages. £14 (hard cover).

Poles Apart

The writings of Gilbert White, the 18th century naturalist are well known, although it is often not realised that he made geological observations too. This was revealed at the first field meeting of the newly formed Geological Section of the Hampshire Club which looked at the geology of the country around Selborne recently, and was led by Dr. June Chadfield, Curator of "The Wakes" the former home of Gilbert White. It is maintained by the Oates Memorial Trust and in addition to the material relevant to White, it displays items connected with two famous exploring members of the Oates Family, one of whom was with Scott in the Antarctic. You will recall Captain Oates was the one who walked out into a blizzard to die; as Scott recorded "it was the act of a brave man and an English gentleman". Attending a function in March to commemorate the centenary of Oates' birth, I noted that a contemporary film of the expedition referred to the fact that Scott's group were still hauling 35lb of geological specimens when they died, despite having abandoned other material in an effort to reduce their load.

Imagine my Surprise

Having escaped to Ireland from the rigours of the museum world recently I was interested to come across a bar called "The South Pole Inn" at Annascaul on the Dingle Peninsula. Tom Crean, a local man, had been a Petty Officer on the Scott Expedition and was in the relief party that discovered Scott's body. He built the Inn on his retirement from the Navy and died there in 1938. It's a small world.

Pole to Pole

An exhibition of this name is currently on show at the Geological Museum in London and celebrates the 150th Anniversary of the Royal Geographical Society. It includes a section on Scott's Expedition, amongst others (not to mention Livingstone's hat!) and can be seen there until September when it travels to the National Museums in Cardiff, Belfast and Edinburgh.

British Fossils

A new display with the above title is due to open at the Geological Museum on 16th May 1980 and it looks well worth a visit. Some two thousand specimens are to be displayed with thirty reconstructed drawings of fossil communities and a range of visual aids for which their exhibitions are renowned. No doubt a review will appear in a future issue.

Geology and the Media

Geology seems to be getting a better press these days for readers of the 'Daily Telegraph' on 7th April were treated to an interesting account of a geological collection which had been donated to Bristol Museum.

However, I expect some of you may have missed Geoff Tresise's recent series of three articles in a trade journal called "Wine and Spirit". Described as "a geologist guide to the geological backgrounds of some of the best-known mines of Western Europe" they make fascinating reading on a subject dear to the hearts of many. It appears Geoff was goaded into the project by the innumerable inane pronouncements on geology by various "Wine" authors. "The Encyclopedia of Wine and Spirits" is apparently referred to as a classic work, although to read that .. "Most of the chalk in Champagne is Kimmeridge Clay" explains the appearance of the above articles.

Next time you are in an Off Licence ask to see a copy of "Wine and Spirits", you will not be disappointed.

The Hop gardens around Alton are a direct result of the Upper Greensand so perhaps a "Geology of Beer" is called for. Perhaps Geoff should compile a similar piece on Whisky to be called 'Scotch on the Rocks'.

Items for "Notes and News" should be sent to:

Tony Cross,
Curtis Museum,
High St.,
Alton, Hants.

or telephone Alton 82802

NOTICES

Building and Ornamental Stones

A collection of approx. 1300 museum grade specimens (1000 polished marble slabs mostly 6" x 4", 300 granites etc.) named and fully catalogued. Application invited from a museum or other organisation with a view to accepting as a bequest in due course. Please apply to: Geologists' Association, Burlington House, Piccadilly, London, W1V OJU.

Curation and Display of the Geological Collection of the Shrewsbury Museum

This project was initially suggested by Dr. Hugh Torrens after his lecture on early Shropshire geologists. He noted that many of the early collections of such people as William Reynolds of Madeley had passed by various routes to the Museum. The historical and educational value of these collections was largely unrecognised. The curator of the Museum, Mr. Priestley, kindly lent Dr. Toghill and John Norton the record of specimens the Museum holds. This list revealed a wealth of specimens many of which are of historical interest. Mr. Priestley wishes to display some of the specimens to illustrate the geology of Shropshire. There appears to be an opportunity for some expert help to be given with the cataloguing of the collection and to assist in the preparation of displays.

The Shropshire Geological Society Newsletter No. 2, Feb. 1980

Robbery

On Friday March 14 1980 a specimen of the Liassic fish Dapedius monolifer was stolen from the Geology Gallery of the Dorset County Museum. The specimen is almost perfectly preserved, measuring 6 inches by 4 inches (approx) and consisting of a mass of shiny black and brown scales. They occur on a matrix of grey shale or cementstone. The specimen carries the Museum accession number DCM G204 in black indian ink. There is also a white paper dot with G204 on it. Any information concerning its whereabouts will be gratefully received.

Paul Ensom,
Dorset County Museum, Dorchester, DT1 1XA
Tel: Dorchester 2735

New Logitech Premises

On Monday, 16th June, we are moving to new premises. Our new purpose-built factory is at Old Kilpatrick, Dunbartonshire, and it will enable us to expand our output significantly; we hope this may yield extra business for you too.

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BOOK REVIEWS

H. A. Nicholson (1844-1899), invertebrate palaeontologist: bibliography and catalogue of his type and figured material. By M. J. Benton. 1979. Royal Scottish Museum Information Series, Geology 7.

Henry Alleyne Nicholson published prolifically over a period of 30 years during the late nineteenth century. He is best known for his work on the fossils of colonial invertebrates and he pioneered the technique of thin-sectioning which now plays a vital part in the study of corals, stromatoporoids and bryozoans. Over 50 genera and 300 species were established by Nicholson in the days before figured and type specimens were given a repository and number on publication. The resultant problems faced by contemporary palaeontologists in tracing Nicholson's specimens are made even more acute by the fact that he deposited his material in 11 different institutions. M. J. Benton's bibliography and catalogue of Nicholson's type and figured material should solve most of these problems.

Following a brief introduction to Nicholson's life, work and collections, Benton lists Nicholson's 181 publications and states the new species described in each and, when known, the month of publication. Most of Benton's catalogue is a species by species listing of Nicholson's type and figured specimens. Wisely, there is no attempt to up-date species names. For each species, the catalogue gives the pertinent publication and the page numbers, figure numbers, localities and horizons of specimens described. These are matched with the registration numbers of the institutions which currently house the specimens. The examples given of Nicholson's handwriting will be of value in tracing the 27% of his figured specimens which remain unlocated. Benton lists additional specimens studied by Nicholson and identifies any lectotypes etc. which have been designated by later workers. There is a systematic index and one of localities. The typographical errors evident in the text (e.g. '-grapsus' for '-graptus') are unlikely to mislead, but a few less trivial errors were found when some BM(NH) registration numbers were checked. However, one would not wish this criticism to depreciate the value of this most welcome publication.

Paul D. Taylor
British Museum (Natural History)

A Museum in Belfast: A History of the Ulster Museum and its Predecessors. By Noel Nesbitt, 1979. Ulster Museum Publication No. 233. £2.00

Noel Nesbitt has done an excellent job of condensing 150 years of history and development into 70 pages of eminently readable, well illustrated text. The booklet deals in four chapters with the Museum in its various periods of growth and development covering all aspects of Museum life from acquisition of specimens to orchestral concerts in the art gallery. It covers financial matters, staff appointments, major events, cataloguing and storage, policy decisions, IRA disruption, and so on the whole being selected and edited so proficiently as to make me feel considerable admiration.

Brian Page.

PARK, A. 1979. The Geology of Lancashire. A bibliography
Lancashire County Museum Service. 45pp.

Apparently, I managed to snag the job of reviewing this bibliography for no better reasons than I am a geologist by upbringing and a Lancastrian by persuasion. I have few Lancastrian geological qualifications, although I know that in the county there are a lot of Carboniferous rocks exposed and a lot of Permo-Triassic ones not, and I am aware that there were glaciers around doing their stuff in the not-too-distant past. The compiler of the bibliography is with me on these. What I also know, is that at least when I was a lad, part of Lancashire was in the Lake District and was hewn from Lower Palaeozoic rocks. Here, the compiler is apparently not with me. For though he might argue that the Lower Palaeozoic is now no longer represented in the county (or is it?), the boundary reorganization responsible has not removed the word 'Lancashire" from a multitude of Lower Palaeozoic stratigraphy, palaeontology, igneous and metamorphic papers published over the past century and a half. At least no mention in the introduction of the (relatively new) limits of the county and therefore the limits of the bibliography would seem to be a bad omission. Curiously, occasional Westmoreland references are included! But to take the work for what it purports to be. Desperate in my general and specific ignorance of how to judge the value of this bibliography I turned in panic to the only earlier similarly titled bibliography I know. Whitaker & Tiddeman (1875, in Hull et al.) published a standard bibliography of 575 papers and maps dated from 1667 to 1874. Of the 450 of these references relevant to Park's list only 31 are quoted. Worse follows: Whitaker & Tiddeman (1875) is not mentioned either. Only one reference predates 1830; Whitaker & Tiddeman list 52 up to this date.

The references are not given in 'World List' or any other standard form; not all are accurately quoted. Strangely (and wastefully) multiple-authored papers are quoted independently under each author, the names apparently in random order. For instance George et al. 1976, is quoted seven times once under each author. None of these seven entries is correct. Lydekker & Bolton's entry is out of alphabetical order.

A bibliography should be a work of scholarship carefully compiled by a specialist preferably over a lifetime of research and interest. This work is a list; additionally it is what it is said to be in the introduction - a list stemming from a (partial) site-survey of part of Lancashire. The work might have been powerfully improved through an appeal to specialists in the field, especially for older references, via the pages of this very journal.

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Philip Lane,
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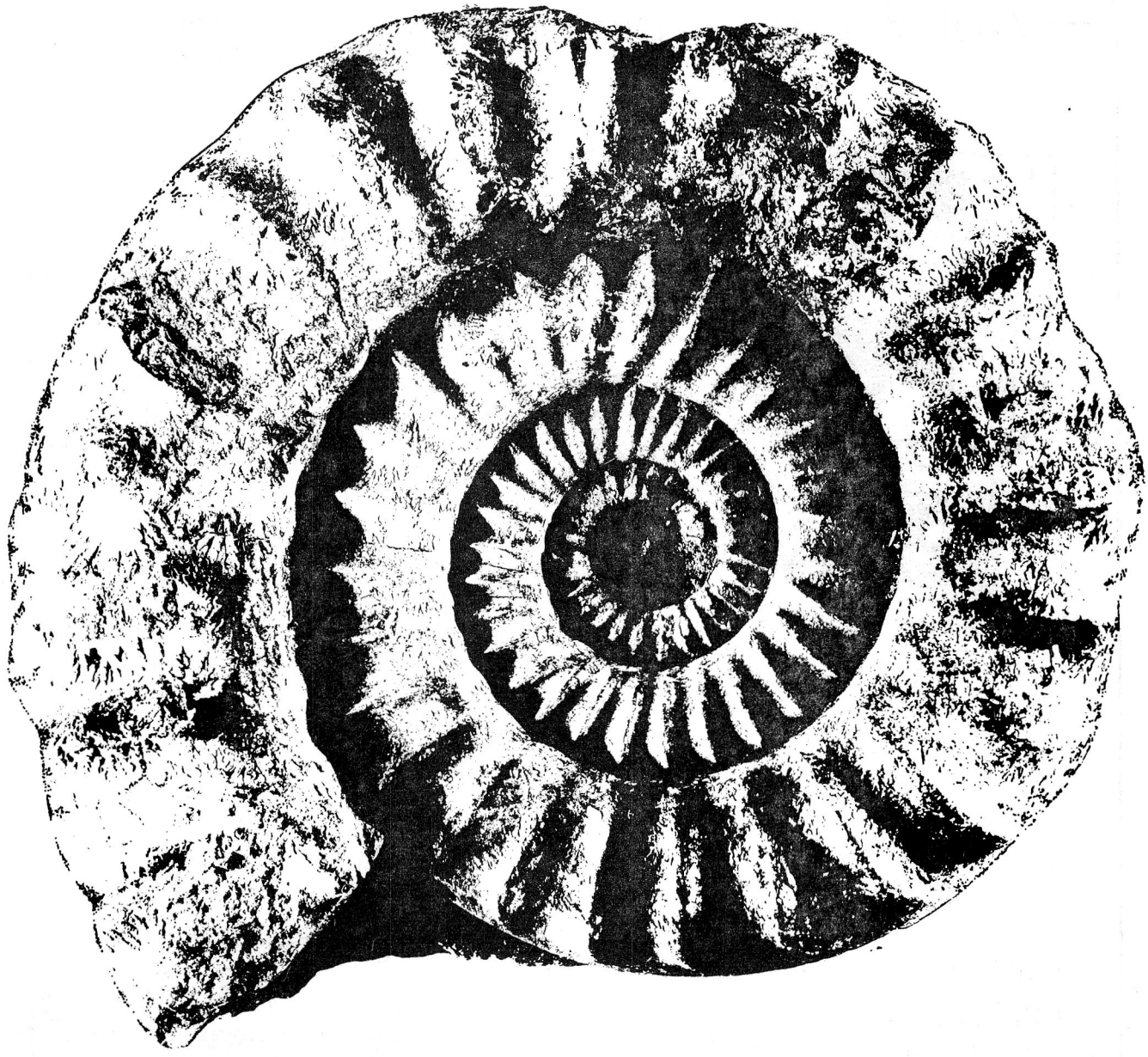

The T.R. Fry Collection

An exhibition of selected specimens from Mr. T.R. Fry's geological collection

From 12 March 1980

City of Bristol Museum & Art Gallery

A handlist to this exhibition is available from the museum shop, price 20p. Please enclose an A4 s.a.e. if ordering by post.

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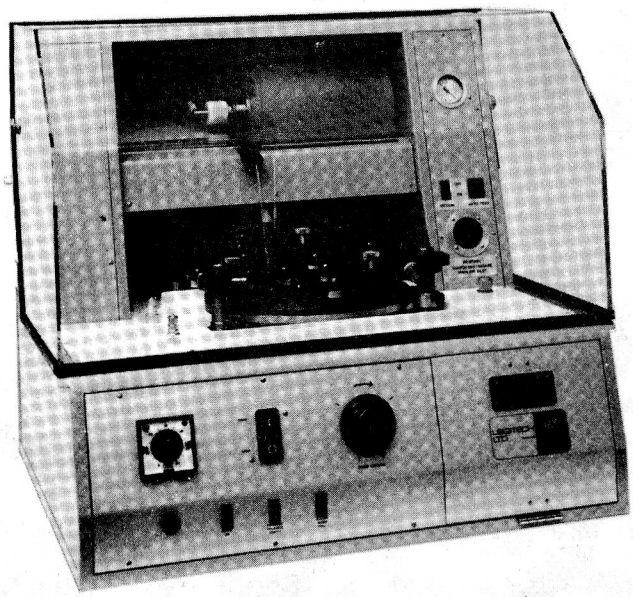

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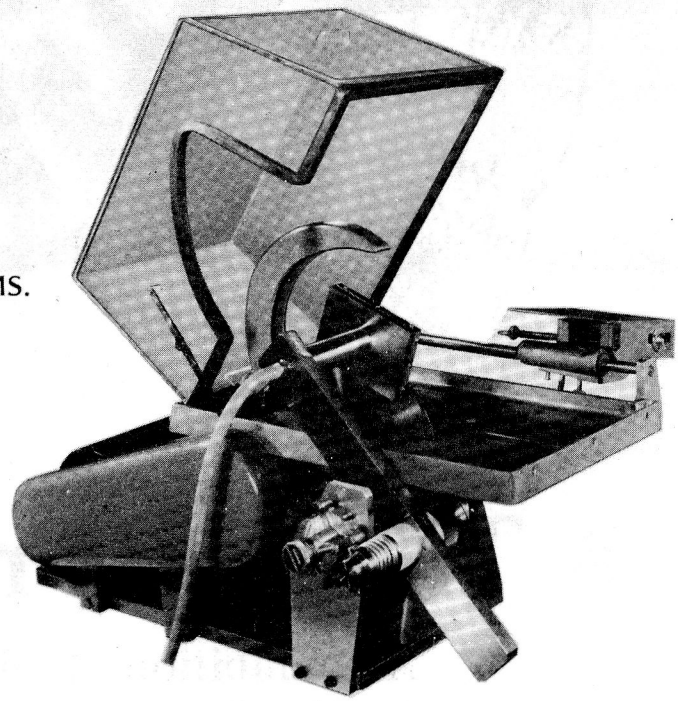

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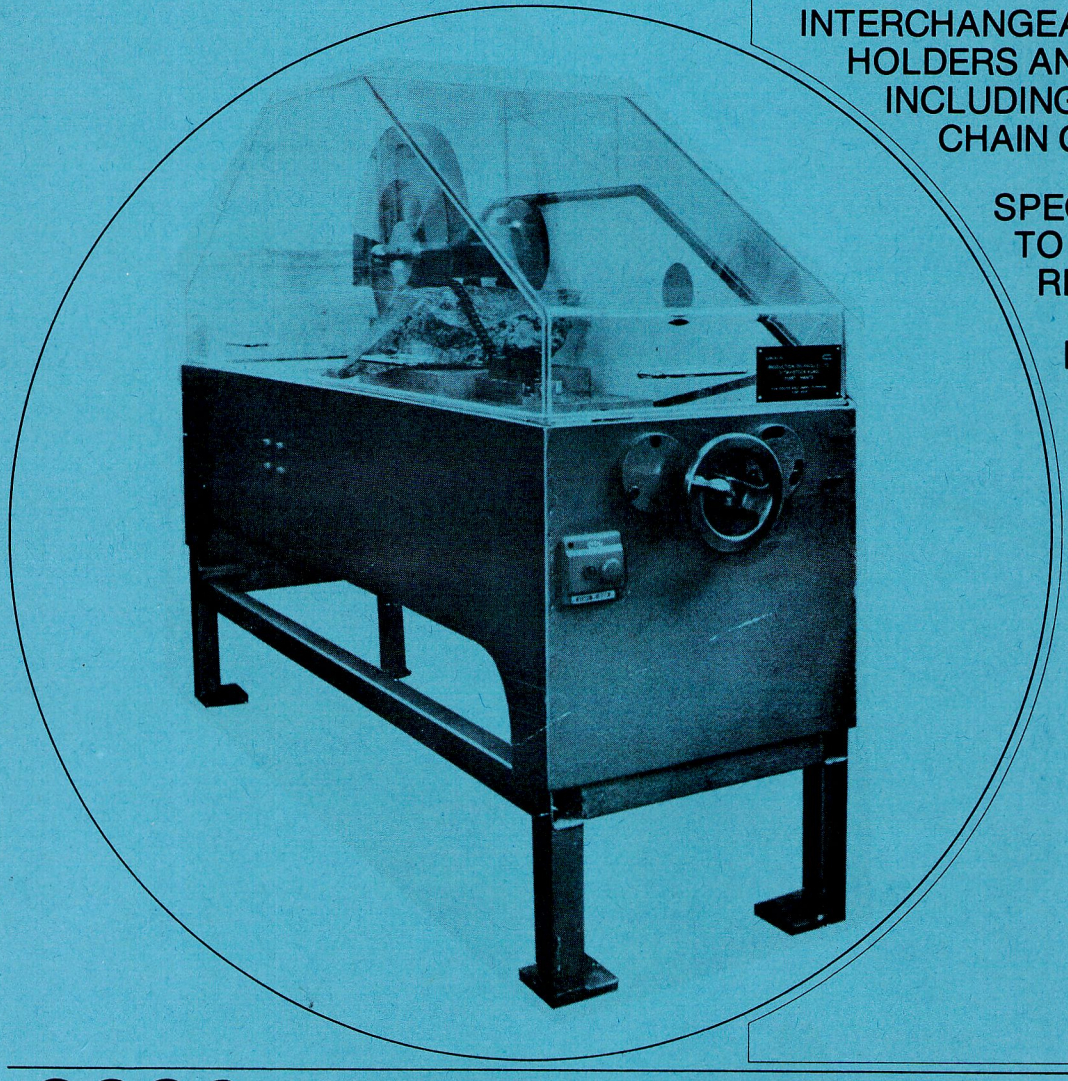

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