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JAMES HALL AND THE PRODUCTS OF HIS FACTORY: IN COMMEMORATION  
OF THE SESQUICENTENNIAL OF THE NEW YORK STATE GEOLOGICAL SURVEY

Robert H. Fakundiny  
New York State Geological Survey  
Albany, NY 12230

and

Ellis L. Yochelson  
U.S. Geological Survey (retired)  
National Museum of- National History  
Washington, D.C. 20560

ABSTRACT

The persistence of the New York State Geological Survey from its inception in 1836 as part of the Natural History Survey of the State is due to the efforts of James Hall. Because of his publication of The Palaeontology of New York and his training of many individuals in his laboratory, Hall's contributions to geology transcended state and national boundaries.

WILLIAM BARTON ROGERS AND  
THE FIRST GEOLOGICAL SURVEY OF VIRGINIA,  
1835 - 1841

Robert C. Milici and C. R. Bruce Hobbs, Jr.  
Virginia Division of Mineral Resources  
P. O. Box 3667  
Charlottesville, VA 22903

ABSTRACT

Virginia was the fifth state in the United States to establish a geological survey. Support for this bold venture to develop the state's mineral wealth came from the Geological Society of Pennsylvania, several prominent Virginia citizens, and county legislators. On March 6, 1835 the General Assembly passed an act to authorize a geological reconnaissance. Shortly there-after William Barton Rogers was appointed to direct the survey, as well as being elected to the chair of natural philosophy at the University of Virginia in Charlottesville. Within a nine-month period he prepared a report on limestones, sandstones, granites, slates, soapstones, coal, ores of iron, copper, gold, and other materials having economic potential. This report influenced the legislature to give financial support to the survey through April 1842. He prepared six annual reports and numerous papers and in 1853 left Charlottesville for Boston, Massachusetts, where he founded the Massachusetts Institute of Technology. Rogers identified several rock units using stratigraphic names correlative with those in Pennsylvania and New York. His works were among the first to deal with igneous and metamorphic rocks in the state. He and his brother, Henry Darwin Rogers, made the first major structural synthesis of the Appalachian chain, recognizing inverted folds and reverse faults. Rogers' works were used as a basis of the development of Virginia geology and mineral resources beyond his demise in 1882. Emma Rogers, his wife, compiled his papers and reports, a vital legacy published in 1884.

William and Henry were in constant contact with one another and many other geologists during their years of study in the Appalachian mountains. Indeed, they relied heavily upon Conrad and

Hall of New York for detailed paleontologic and stratigraphic work, which they applied to their own areas in Virginia and Pennsylvania.

HENRY ROGERS AND JAMES HALL OF THE PENNSYLVANIA AND NEW YORK  
GEOLOGICAL SURVEYS, 1836 TO 1842

by

Donald M. Hoskins

Pennsylvania Geological Survey

Harrisburg, Pennsylvania, 17120

ABSTRACT

The Pennsylvania and New York Geological Surveys received authorization in 1836, within days of each other. Their authorization ended in 1842, within a few months of the other. Largely through the indomitable characters of James Hall and Henry Rogers, after authorization lapsed, both Surveys continued and produced large, important volumes on the geology of their respective states that set the framework for much of the later geo-logical survey work of the Appalachians.

New York had its John Dix, who was the Secretary of State, and Pennsylvania had its Charles Trego, Member of the House of Representatives -both government officials who shaped the course of each Survey. But the differences in the Paleozoic rocks - thin, ubiquitously horizontal and replete with fossils in New York; thick, repetitively folded and faulted, with fewer well-preserved fossils, in Pennsylvania - determined the approaches and results of these Surveys.

From the efforts of the State Geologists of New York and Pennsylvania, along with Edward Hitchcock of Massachusetts, was born the Association of American Geologists, this later to become the American Association for the Advancement of Science. Not all of the interactions between the two surveys were to be so cooperative. Hall sought to obtain other states information for his maps. Refused by Henry Rogers, Hall circumvented him by contacting Charles Trego, who later became an impediment to Rogers' plans for publication of the Pennsylvania reports.

## JAMES HALL AND THE NEW YORK SURVEY

Michele L. Aldrich

American Association for the Advancement of Science

1333 H St. NW Washington D.C. 20005

Alan E. Leviton

California. Academy of Sciences

Golden Gate Park

San Francisco CA 94118

### ABSTRACT

Hall's career with New York State was as stormy as his relations with many of his disciples. A few years after completing his education with Amos Eaton at Rensselaer Polytechnic Institute, Hall served during 1836-1837 as Ebenezer Emmons' assistant on the New York State Natural History Survey, working on the iron ores of the Adirondacks. From 1837 to 1842, Hall was the survey geologist assigned the western counties of the state. He contributed equally with the other geologists to the creation of the New York System for Paleozoic rocks; it is important, in focusing on Hall, not to lose sight of what the others provided to its development. Hall's final district report, published in 1843, evidenced his ability and interest in paleontology. The state hired him to research and write up New York's fossils, an assignment given in 1837 to Timothy Conrad, who had not completed the report. Hall was to spend the next several decades on the task, issuing thirteen sumptuously illustrated volumes. Through 1859, Hall took the fossils in stratigraphic order, but by 1867 he had switched to a biological approach, in part because by that time he had reached the rich and complex Devonian fauna. State support for the Palaeontology was uneven; in 1850-55, Hall worked without salary on the books. He used the reports to discuss other important geological topics and to air his position on geological controversies, some of them centered on rocks outside of New York. His parade of laboratory and field assistants helped in various degrees, sometimes with stinging acknowledgment from Hall. His international reputation was based in large part on his work for New York State, and it remains a durable legacy to science.

## JAMES HALL'S AMATEURS

John W. Wells

Department of Geological Sciences

Cornell University

Ithaca, NY 14853

### ABSTRACT

Besides the various professional fossil collectors employed by James Hall to work in particular parts of the state, there were many "amateurs" for whom fossils were more or less of an avocation. From the middle 1840's to the end of the Hall era, the names of more than 150 amateurs can be counted - farmers, teachers, professors, students, clergymen, businessmen, physicians, and men of leisure, ranging from those who collected purposefully to those who casually picked up a specimen here and there. Very many of their finds came to Hall or the State Cabinet; many became types of new species to be described and figured by Hall, the collector's name often becoming the species eponyms. A sampling of their finds gives a glimpse of the activities of amateurs from 1847 to the time of Hall's death in 1898.

MEEK AT ALRANY, 1852-58

Clifford M. Nelson  
11537 Links Drive  
Reston, VA 22090  
ABSTRACT

F. B. Meek served as James Hall's salaried assistant and draughtsman at Albany during 1852-58. Meek gained experience in paleontology of New-York" and other projects, In aiding Hall's "Palaeon-Meek gained experience in field work, curation, research, illustration and publication that he developed in collaboration with F. V: Hayden and others to fulfill Hall's promise to make Meek an original investigator in paleontology and integrity, A dispute with Hall about scientific identity rekindled by the Permian controversy, years at Albany. ended Meek's In 1858, Meek joined Hayden at Washington and continued work in paleontology and stratigraphy at the Smithsonian, under contract to the Federal and several State

"I would have sworn my life on your interpretation:"  
James Hall, Sir William Logan and the "Quebec Group"

William E. Eagan  
History Department  
Moorhead State University  
Moorhead, MN 56560  
ABSTRACT

The establishment of a stratigraphic succession for the Paleozoic rocks south of Quebec City created a bitter international confrontation in the 1860's. Establishing the geological framework for Canada after 1842, Sir William Logan relied on the system of nomenclature established by the New York Geological Survey and James Hall. Moreover, in elaborating a stratigraphic succession for the Quebec rocks, Logan drew directly on Hall's paleontological expertise. Their combined skills contributed to a coherent column for the "Quebec Group." Yet in 1861 new trilobite evidence proved the column wrong, created a strident conflict between Logan and Hall, dragged them into the "Taconic" controversy and seriously damaged their close working relation-ship.

ROBERT PARR WHITFIELD:  
HALL'S ASSISTANT WHO STAYED TOO LONG

Roger L. Batten  
American Museum of Natural History  
New York, New York  
ABSTRACT

R. P. Whitfield was born near Utica in 1828. He had *no* formal education. He was deeply committed to natural history and joined a Utica society at 17 and bought a microscope and soon became well known as a naturalist illustrator. At 20 years of age he began working in a scientific instrument business at Utica and within a year became a partner. He caught the attention of

Cal. Jewett, a curator of the State Cabinet and joined the Hall paleontology group in 1856. He was Hall's chief illustrator for 10 years, gradually learning the trade and becoming Hall's chief assistant. In 1869, trouble developed over the authorship of a paper on Devonian clams and their relationship quickly deteriorated to the point that Whitfield looked for a position elsewhere, securing such at the American Museum of Natural History in 1877. Even when he left, Hall accused him of breach of contract but evidence indicates that Hall knew that he had the job in New York following the purchase of Hall's collection by the American Museum of Natural History. Whitfield became an active producer of papers on a wide variety of paleontology averaging 3-4 per year and became a major influence in Paleontology in the 1880-1900 period. He died shortly after he was retired at the age of 82 in 1910.

"A BETTER STYLE OF ART": THE ILLUSTRATIONS OF  
THE Paleontology of New York  
Ann Shelby Blum 111 Foster Street Cambridge MA 02138  
ABSTRACT

James Hall, like other authors and editors of 19th-century American state and federal surveys, learned first hand that publishing illustrations was time-consuming, frustrating and expensive. But illustrations were indispensable, providing the graphic communication of morphology that justified the author's taxonomic decisions. That essential information, however, passed through the hands of an illustrator and either an engraver or lithographer before it reached the scientific audience that would test and judge it. Artists and printers, therefore, needed close supervision: plates required careful proofing and sometimes cancellation. Hall, like his colleagues, vastly underestimated the time and expense that his project would entail.

The plates illustrating the Paleontology reflected changes occurring in 'American science and printing. Over the decades spanned by the publication, picture printing techniques changed from craft to industry, and converted from engraving to lithography; so did the New York survey. Meanwhile, the scientific profession developed illustration conventions to which publications with professional intent increasingly conformed. These conventions combined standards of "accuracy" with issues of style to reflect both scientific activity and its social context. The early illustrations drawn by Mrs. Hall were no less "accurate?" although clearly less polished than the collaborations between R.P. Whitfield and F.J. Swinton, or the later work of J.H. Emerton and E. Emmons, Jr. The artists and printers of the Paleontology plates emulated and contributed to the emerging national style of zoological and paleontological illustration, and thus helped consolidate the "look" of American science.

WALCOTT IN ALBANY, NEW YORE:  
JAMES HALL'S "SPECIAL ASSISTANT"

Ellis L. Yochelson

United States Geological Survey (retired)

National Museum of Natural History

Washington, D.C. 20560

ABSTRACT

D. Walcott was associated with James Hall in Albany New York, 1876-1879, although for at least seven of these 33 months he was in the fields "special assistant" During most of this interval he was working at both the New York State Museum and Hall's private laboratory, by Hall and publishing papers as directed Walcott spent two long field seasons collecting Middle Paleozoic fossils, and in spite of his activity was abruptly discharged by Hall. Throughout his stay in Albany, Walcott pursued research interests of his own, after regular working hours. Walcott learned a great deal of paleontology during his time in Albany, probably more from study of the fossil collections and Hall's library than from direct conversation with Fall, for he considered Louis Agassiz his mentor. Walcott joined the new U. In July, 1879, Director of that agency, S. Geological Survey and rose to be Smithsonian Institution. subsequently becoming Secretary of the Perhaps the most important thing Walcott learned in Albany was how to lobby legislators for science, a skill he honed throughout his subsequent career.

SOME PROBLEMS IN THE PUBLICATIONS OF JAMES HALL OF ALBANY

Alan Stanley Horowitz

Department of Geology

Indiana University

Bloomington, IN 47405

ABSTRACT

Multiple publication of the works of James Hall (1811-1898) causes problems in priority of taxonomic names and presents a nightmare of variorum editions that tax the patience of paleontologist and librarian. Criticism during Hall's lifetime did nothing to correct matters and the available evidence for evaluating the different editions of Hall's work is rapidly eroding.

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JAMES HALL AND FOSSIL CORALS

William A. Oliver, Jr.

U.S. Geological Survey, Washington, D.C. 20560

ABSTRACT

During his long career, James Hall named and described over 250 species and several genera of fossil corals, mostly of Middle Silurian to Middle Devonian age. Hall's principal coral works were published in 1843, 1877, 882-84, and (with G. B. Simpson) 1887. Sporadic work on corals continued to 1898, the year of his death. In spite of shortcomings, his four main contributions

provided the taxonomic base for much of the later work on Helderberg, Onondaga and Hamilton corals in New York and adjacent areas.

Beginning in 1868, George B. Simpson was one of Hall's many assistants. He began as illustrator, became a describer of corals and bryozoans, and ultimately co-author of the 1887 work. His own study of Paleozoic coral genera, based on thin section analyses, began the post-Hall era of coral work in eastern North America.

#### JAMES HALL AND THE ALLENS OF ALFRED

Daniel B. Sass  
Department of Geology  
Alfred University  
Alfred, New York 14802

#### ABSTRACT

James Hall (Iall-laga), New York's first distinguished paleontologist, was well acquainted with Alfred, New York, and its citizens. As an ambitious young man, he was assigned (1837-1843) to explore the newly created Fourth District, comprising most of western New York. He could not have anticipated meeting the Allen family and that the resulting social-scientific relationship would play an important role in his study of the Paleozoic Reticulate Sponges and endure for the rest of his life.

#### LUMINARIES OF THE ALBANY ERA: BEECHER, SCHUCHERT, AND HALL

Preston E. Cloud, Jr.  
Department of Geological Sciences  
University of California, Santa Barbara  
Santa Barbara, CA 93106

#### ABSTRACT

James Hall of Albany, Director of the New York State Museum from 1866 until his death at 86 in 1897 was the most noted American geologist and paleontologist of his time. He originated the geosynclinal concept of mountain-building and ideas of gravity-mass-movement. He became the 19th century's most productive paleontologist by dint of unsparing drive, coupled with high ability and the talent and labors of six unusual "personal assistants".

Among the latter were two gifted and dedicated Charleses, Beecher and Schuchert, who later established invertebrate paleontology at Yale and made it the North American mecca of the field for many years. Beecher, comfortably raised, well educated, biologically focussed, tragically short-lived, preceded his close friend and successor in Hall's employ. Schuchert, son of an impoverished immigrant cabinet maker, with only a primary school education, was geologically inclined, and long-lived. Coming to New Haven as he did, after 10 years of experience with the U.S. Geological Survey and the Smithsonian's Museum of Natural History, as well as his time in Albany, Schuchert provided the ideal complement to Beecher. Both were fine collectors,

preparators, and illustrators as well as first rate scientists. Both became renowned scientists in their time. And both enriched the global scientific heritage with their publications.

The Albany School was clearly the place to launch a career in paleontology during the last half of the 19th century. The subsequent lives of Beecher and Schuchert testify to that.

#### JOHN MASON CLARKE: JAMES HALL'S PROTÉGÉ -SUCCESSOR

Donald W. Fisher State Paleontologist Emeritus  
New York State Geological Survey  
Albany, N.Y. 12230

##### ABSTRACT

John Mason Clarke, the successor to James Hall as State Paleontologist of New York, was both similar and dissimilar to his mentor in his approach to paleontology and paleontologists. Both were intensely passionate in their pursuit of paleontological research. However, their opposing personalities mandated that they travel vastly differing avenues toward implementing the accomplishments of the New York State Geological Survey and State Museum during their respective eras.

#### RUDOLF RUEDEMANN: INHERITOR OF JAMES HALL'S GRAPTOLITE LEGACY

William B. N. Berry, Museum of Paleontology, University of  
California, Berkeley, CA 94720

##### ABSTRACT

James Hall's (1865) Graptolites of the Quebec Group was cited by O. M. B. Bulman as - - -. "the first work of real insight" in the study of graptolites. In that work, Hall established standards of excellence in graptolite descriptions and illustrations that future students of graptolites had to match or surpass. Hall also suggested possible phyletic relationships among graptolites and a potential mode of life for them. As well, he reviewed their stratigraphic and geographic distributions. During his career, Hall amassed a large collection of New York graptolites. Only near the end of his career did a person emerge with the seeming skills and insights who could carry out a study of Hall's New York graptolite collection in a style that could match Hall's work with the Quebec Group graptolites. That person was Rudolf Ruedemann. Ruedemann, though he had little contact with Hall, inherited Hall's legacy. That legacy was detailed, precise illustrations and descriptions of graptolites as well as analyses of their relationships, modes of life, and distributions in space and time. Ruedemann carried out that task inherited from Hall, publishing two monographs on New York graptolites. Ruedemann went on in his own career to demonstrate the usefulness of graptolites in solving geologic problems and to document the usefulness of geologic mapping in establishing stratigraphic and geographic distribution patterns among fossils.

The New York State Museum: Child of the Geological Survey that  
Grew to be its Guardian  
Robert H. Fakundiny  
New York State Geological Survey  
Albany, New York 12230  
Abstract

The New York State Museum was created by State legislation in 1870 out of the old State cabinet, which held the specimens collected by the State Geological and Natural History Survey. James Hall, then State Geologist and Palaeontologist within the Survey, was named Director of the Museum. Hall's need to possess and study vast quantities of paleontological specimens required space for collections storage and processing. His collections became the major supply of specimens for the Cabinet and eventually the Museum. After the original Survey was disbanded, in the early 1840's, Hall's presence gave the Cabinet a definite geological character. As the chief geological scientist, Hall considered the geological research of the Cabinet and later the -Museum as a product of the "Geological Survey of New York," even though no formal designation of such a unit was ever proclaimed by state legislation. After all, other states were forming geological research units similar to Hall's and calling them geological surveys. It made sense for good communications for Hall and his predecessor State Geologists to refer to their staff as the New York State Geological Survey. Eventually, through a series of other legislative acts, most importantly in 1904 and 1945, the Museum was made the formal administrative home for the Geological Survey and, thus, its guardian. Museum Directors, therefore, have had the principle role in determining the fate of geological and paleontological research within the Geological Survey. After 1926, when the first non-geologist became director, the Museum's research scope grew faster in other natural and social history areas, such as botany, entomology, zoology, archaeology, ethnology, and history. This expansion is exemplified by the addition of a State Historian to the Education Department in 1895. During its 150-year history the Geological Survey has moved six times, and it is now housed in the Cultural Education Center in the Governor Nelson A. Rockefeller Empire State Plaza, Albany, New York.