

## THE SIGNIFICANCE OF THE UNION CHAPEL MINE PROJECT TO ALABAMA PALEONTOLOGY

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**ABSTRACT:** The collection and cataloging of fossil trackway material from the Union Chapel Mine has provided a unique opportunity for the professional and amateur paleontological communities of Alabama to share in a scientifically significant undertaking. The UCM site has now been recognized as one of the most important Upper Carboniferous ichnofossil locales in North America. Determined efforts by members of the Alabama Paleontological Society to salvage the mine's rich and taxonomically diverse fossil vertebrate and invertebrate trackways before the impending reclamation of the site has resulted in a treasure trove of material that should provide important insights into the paleoecology of Coal Age Alabama for many years to come. The loss to science of fossil trackway material collected from Pennsylvanian sites in Alabama prior to the Union Chapel Mine preservation efforts stands in stark contrast to the success of the the Union Chapel Mine project. The ongoing planning to organize future use of the mine site for scientific study and educational purposes offers yet another opportunity for these diverse amateur, educational, and professional groups to combine efforts in a cooperative project of great significance to the scientific community and the state.

### INTRODUCTION

The collection and documentation of preserved trackways and other fossil material from the Union Chapel Mine by the Alabama Paleontological Society (APS), Inc. (formerly called the Birmingham Paleontological Society) during 1999-2005 has promoted the development of a unique partnership between the professional and amateur paleontological communities in Alabama. While cooperative efforts between amateurs and professionals are not unusual, and indeed have been an important part of paleontology since the discipline first became a science late in the 18th century, this particular association has many unique qualities about it. It is common practice for museums or other paleontological organizations to enlist the help of amateurs to carry out field work in excavations of paleontological sites, but it is unusual for amateurs to constitute the major driving force in the discovery and preservation of a new and potentially important site through actively soliciting the services of paleontological professionals.

The task of salvaging the exceptional fossil material from the Union Chapel Mine before its mandated reclamation was undertaken by members of the APS, who recognized the potential scientific value of the material they had uncovered at the site. The group saw early in their exploration of the mine that a major ethical and scientific responsibility facing them lay in determining how best to announce the site's discovery, assess the quality of fossils, and properly catalog the large body of accumulated fossil material. The inherent danger in any amateur exploitation of a significant fossil site lies in the potential for loss of important material into private collections before systematic study of the collected items is implemented. The loss to science resulting from significant fossil material disappearing into private collections before adequate evaluation by mem-

bers of the scientific community over the years has undoubtedly been enormous. Usually the task of preservation of an important fossil site is undertaken by professional paleontologists or personnel working with an established museum. The unique attribute of the UCM project lies in the fact that the major impetus toward recognition and preservation of the site has come from responsible action taken by amateurs.

Recognizing the importance of immediate and thorough documentation of the fossil material, members of the APS developed a method of systematically identifying and cataloguing the fossil trackways through hosting a series of "track meets" (Fig. 1; see also Buta and Minkin, 2005) held at different locations within the state. All noteworthy fossil material collected at the mine by members of the group was amassed for the purpose of cataloguing through identification number, identity of collector, location of temporary museum repository or private collection, and for the creation of a photographic database. Since the Alabama Museum of Natural History, the site of the first of these "track meets," had storage space for only a small portion of the thousands of fossil trackways salvaged from the mine, it was necessary to rely on private collectors to serve as temporary repositories for most of the trackway slabs. Prompt cataloguing and photographic documentation was seen by the group as the most viable method of ensuring that potentially significant material was made accessible to paleontological specialists and not placed prematurely out of scientific reach in uncataloged private collections. Researchers from a number of relevant fields of study were invited to these "track meets" to examine the fossil material as it was being catalogued and photographed. The APS members who organized the events anticipated that the large volume of fossil material displayed and the exceptional quality of preservation would likely prompt scientific professionals who attended the events



FIGURE 1.

to consider conducting research into various aspects of the material.

#### FOSSIL TRACK COLLECTION IN WALKER COUNTY IN THE YEARS PRIOR TO THE UNION CHAPEL MINE PROJECT

The success of the Union Chapel Mine preservation project stands in stark contrast to the fate of fossil vertebrate trackway material collected from the Black Warrior Basin of Alabama in the years just prior to the discovery of the UCM site. During the early to mid-1990s the first author of this essay was involved with similar recovery efforts of fossil trackway material from several mine sites in Walker County. As with the Union Chapel Mine project, attempts were made at these sites to salvage fossil trackway material before impending reclamation of the mine areas.

The first of these fossil track sites was an abandoned coal strip mine covering approximately ten acres near the community of Kansas, Alabama. During searches for fossil plant material at the unreclaimed mine, several sets of fossil trackways were found preserved in a distinctive, buff-colored, fine-grained sandstone facies. These track sets included tetrapod vertebrate prints, tracks of millipede-like creatures, and numerous traces thought to have been produced by insect larvae. The abandoned mine site was visited by a small group of collectors during the winter of 1992-93 for the purpose of searching for further trackway material. All members of the geology faculty of the University of North Alabama at the time accompanied the senior author in these collecting excursions. Graduate and undergraduate students also assisted in the search for fossil track material on several occasions. Attempts to engage paleontologists from the Alabama Museum of Natural History and the University of Alabama in the task of collection and identification of this trackway material were unsuccessful. Many of the less distinct track sets were discarded due to lack of appropriate storage space at the University of North Alabama. The best of the track sets were placed behind glass in a hallway exhibit on

Alabama Coal Age fossils in the geology department at the university. A small number of track slabs were set aside by this author for possible later study. These included a sampling of well-preserved primary tracks of vertebrate creatures later identified by Professor Haubold (Haubold et al., 2005) as those of *Notalacerta missouriensis* (Fig. 2), produced by a probable anapsid-type amniote animal.

A second fossil trackway site was discovered during the mid-1990s that was even richer in material than the Kansas track site. A University of North Alabama geology department collecting trip to the Cedrum Mine, operated by the Drummond Coal Company near the community of Townley in Walker County, led to the discovery of a number of fossil trackways. Many hundreds of track sets were eventually found, but most were of invertebrate creatures such as horseshoe crabs and millipedes. On three occasions collecting trips were organized to allow students and UNA faculty to participate in this collection of fossil trackways, as well as to gather specimens of the abundant fossil plant material found at the mine. In addition to the UNA geology faculty involved with track collecting at this site, two members of the UNA Biology faculty and two members of the UNA Chemistry Department accompanied the groups. Few vertebrate trackways were taken during this period of exploration at the Cedrum Mine, but several examples of *Cincosaur*-type prints were collected by this author

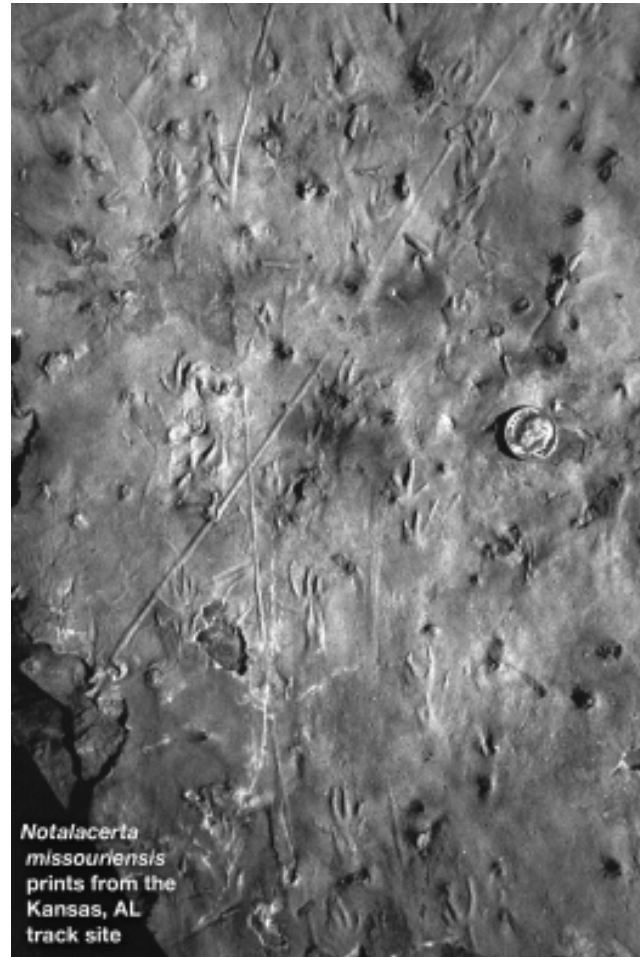


FIGURE 2.

near the far western end of the Cedrum Mine, where it bordered Yellow Jacket Road southeast of the town of Carbon Hill. The Cedrum Mine was an extensive excavation, covering several square miles, but only a small portion was examined for fossil trackways in the brief time the site was available for collecting.

Another abandoned mine area that produced fossil trackways in the years preceding the UCM discovery became known to collectors as the Fern Springs Mine, for its location on Fern Springs Road in far western Walker County. Active mining at this site had been completed several years previously, but it had not undergone reclamation due to the reported bankruptcy of the mining company involved. A number of vertebrate track sets were recovered from this location by the senior author and members of the APS over the course of several years. Fossil trackways later identified by Professor Haubold as those of *Notalacerta*, *Cincosaurus*, and two small, temnospondyl amphibians were taken from this mine site during this period of collection. Most track sets came from a light colored, fine-grained sandstone that lay stratigraphically above the Jagger coal seam. The track material had been strongly weathered from having been exposed for nearly ten years since the active mining at the site ceased, but the unreclaimed spoil piles were still producing recognizable track sets at the time of Professor Haubold's visit to the mine site in February of 2003 (Fig. 3). All of these three fossil track sites listed here have since been reclaimed.

The fate of fossil track material collected earlier from these Walker County sites offers a cautionary tale on the probable fate of the UCM material had the APS members not instituted their preservation efforts. During Professor Haubold's visit to Alabama in February of 2003 to study the UCM fossil material, an attempt was made to locate examples of trackway specimens collected at these older mine sites. Of the many dozens of fossil vertebrate trackways taken from the earlier Walker County sites during the 1990s, not a single track set outside of a handful kept by this author could be



FIGURE 3.

located for inspection by Professor Haubold during his visit. Reasons for the loss of these fossils were many. The UNA geology department had undergone major personnel changes since the tracks were first collected, students with some of the fossil track sets had graduated and left the area, and the department's display of the fossil trackways had been disassembled and the fossils discarded due to lack of storage space on campus. The loss of all these potentially significant fossil track sets collected prior to the UCM project highlights the importance of the APS members' preservation efforts. It is unlikely that any of this earlier material will re-surface with the necessary documentation that would allow them to have valid scientific context.

### THE FUTURE OF THE UNION CHAPEL MINE PROJECT

The initial phase of cooperative interaction between the professional paleontologists and the Alabama Paleontological Society was brought to fruition with the organization of a special *Workshop on Permo-Carboniferous Ichnology* that was held on the campus of the University of Alabama in May of 2003. At this workshop speakers presented papers on various aspects of the Union Chapel Mine and its ichnofauna, as well as on related topics of ichnology on a more general scale. These presentations were conducted by professional as well as by amateur paleontologists, and the diversity of workshop speakers and the topics on which they spoke symbolized well the unique spirit of cooperation that had been developed between the two groups.

The second important stage of cooperative effort related to the discovery and preservation of the fossil trackways from the Union Chapel Mine lies in the creation of this monograph, which summarizes the UCM project and its paleontological significance. Papers presented in this document include contributions from both research-level paleontologists as well as amateurs. Important developmental dynamics of the UCM project are described here by those most closely associated with the preservation efforts. The documentation of these efforts might provide a model for similar future successful preservation projects to be carried out elsewhere.

The most recent, and in many ways most important, task of the Union Chapel Mine project undertaken by APS members was to institute formal efforts to acquire the UCM site as a study area for future research. These efforts are chronicled in a separate paper (Atkinson et al., 2005). Members worked diligently to explore legal ways that the site might be saved from reclamation and preserved for future generations of researchers. After several years of uncertainty, these efforts finally succeeded in 2004 when the State of Alabama agreed to take possession of the mine site and preserve the unreclaimed portion for future scientific study as the Steven C. Minkin Paleozoic Footprint Site. The agreement by the State to accept responsibility for the site was unprecedented in the sense that no case of this kind had ever been ushered through the legislative and bureaucratic processes, let alone successfully.

It has been suggested that the Union Chapel Mine

might some day become the first publicly owned Alabama “paleopark”, an important paleontological site preserved solely for the purpose of ongoing research and education. While these efforts are not complete at the time of this writing (February, 2005), it is anticipated that a satisfactory arrangement can be finalized among all parties involved to dedicate the use of the site for these purposes. This final incarnation of the Union Chapel Mine project would certainly serve as a fitting culmination to the exceptional cooperative interaction that has taken place to bring about the recognition and development of this world-class Alabama Coal Age paleontological site.

### REFERENCES

- Atkinson, T. P., Buta, R. J. and Kopaska-Merkel, D. C., 2005, Saving the Union Chapel Mine: how a group of determined amateurs teamed up with professionals to save a world-class trackway site in Alabama; in Buta, R. J., Rindsberg, A. K., and Kopaska-Merkel, D. C., eds., *Pennsylvanian Footprints in the Black Warrior Basin of Alabama: Alabama Paleontological Society Monograph no. 1*, p. 191-200.
- Buta, R. J. and Minkin, S. C., 2005, The salvaging and documentation of trace fossils from the Union Chapel Mine; in Buta, R. J., Rindsberg, A. K., and Kopaska-Merkel, D. C., eds., *Pennsylvanian Footprints in the Black Warrior Basin of Alabama: Alabama Paleontological Society Monograph no. 1*, p. 19-27.
- Haubold, H., Allen, A., Atkinson, T. P., Buta, R. J., Lacefield, J. A., Minkin, S. C. and Relihan, B. A., 2005, Interpretation of the tetrapod footprints from the Early Pennsylvanian of Alabama; in Buta, R. J., Rindsberg, A. K., and Kopaska-Merkel, D. C., eds., *Pennsylvanian Footprints in the Black Warrior Basin of Alabama: Alabama Paleontological Society Monograph no. 1*, p. 75-111.

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