Lyman Child Wooster: Career and geological contributions

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L.C. Wooster was a naturalist and science educator whose career at Kansas State Normal School (later Kansas State Teachers College, now Emporia State University) spanned four decades. He was born in upstate New York and received his college education mainly in Wisconsin. During the period 1873 to 1882, he worked for the Wisconsin Geological Survey and the U.S. Geological Survey under T.C. Chamberlin. Shortly afterward, Wooster moved to Kansas, where he was superintendent of the Eureka Public Schools. In 1897, Wooster was appointed Professor of Biology and Geology at the Kansas State Normal School in Emporia, where he remained for the rest of his career. His primary interest was collecting fossils, and he also conducted local field studies, concentrating mainly on glaciation in northeastern Kansas and ancient drainage in east-central Kansas. He published many scientific articles and wrote books for use in his biology and geology classes. He is remembered today in place names on the ESU campus.

Keywords: Kansas State Normal School, fossils, glacial geology, T.C. Chamberlin, science education.

INTRODUCTION AND CONNECTION WITH CHAMBERLIN

Lyman Child Wooster was born August 1, 1849, to Lyman Wooster and Pamelia Child in North Hammond, St. Lawrence County, New York . L.C. Wooster married Ellen Ada Bassett; they had four children, two sons and two daughters (Ancestry 2012). L.C. Wooster died in 1947 at Emporia, Kansas. Wooster was a naturalist, which meant he worked with biology, fossils, geology, and related subjects. He was also a science educator, a teacher of teachers, as well as an educational administrator. Wooster spent most of his career at Kansas State Normal School (later Kansas State Teachers College). He had a long life and remained active well into his 80s.

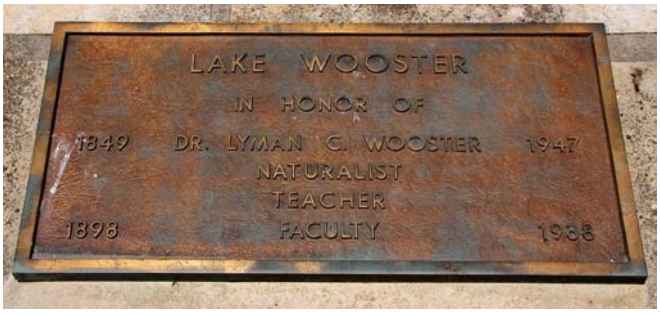
Lyman Child Wooster was born and raised in northernmost New York. His father was descended from the Wooster family of Connecticut which included Gen. David Wooster who served in the French and Indian and Revolutionary Wars (Blackmar 1912). His mother came from the Child family of Welsh and English origins. Wooster spent his childhood on a farm where he undoubtedly gained a lifelong fasination for fossils, in particular, and biology and geology, in general. Upstate New York was a focal point for geological discoveries and theoretical concepts during the mid-nineteenth century (Faul and Faul 1983).

As a young man, Wooster moved to Wisconsin, where he attended Milton College (1865-1867). He also attended the Wisconsin State Normal School from 1870 to 1873 (whether the Whitewater or Plattville campus is uncertain) and Beloit College from 1873 to 1875. He went to Yale University in 1881 and 1882 (Blackmar 1912). From 1873 to 1879, he worked for the Wisconsin Geological Survey, at which time he was in his late 20s and was a professor of natural science at the Wisconsin State Normal School (1878-1881). During this period, Wooster was one of six assistants under Thomas Chrowder Chamberlin, who taught at Beloit College. Wooster was involved in a state geologic mapping project, from which Chamberlin began to develop his ideas about continental glaciation (1882). In addition, Wooster was assigned to investigate the geology of northwestern Wisconsin where he studied conditions related to copper deposits (Wooster 1884).

At the Wisconin Geological Survey, Chamberlin was the Assistant State Geologist (1873-1876) and was promoted to Chief Geologist (1876-1882) while still teaching at Beloit College. In 1881, Chamberlin went to the U.S. Geological Survey (USGS) as Chief of the Pleistocene (glacial) division. His main task was the mapping of glacial moraines from the Atlantic to the Dakotas. Wooster was one of Chamberlin's principal coworkers during the first two field seasons. At this time, Wooster was in charge of mapping Michigan. He conducted field mapping during the summers of 1881 and 1882, tracing moraines across Michigan, and continued working at the USGS until 1884. Through his work in Michigan, Wooster developed a lifelong interest in the subject of glaciation. He furnished much information that was published later by Chamberlin (1886).

WOOSTER'S MOVE TO KANSAS

Wooster moved to Kansas with his wife in late 1882 or 1883 to become superintendent of Eureka Public Schools in Greenwood County (Blackmar 1912). He developed a 12-year education plan that emphasized language and natural science. During this time, he discovered two granite boulders nearby. The larger boulder weighed more than 360 pounds (>160 kg) and was located 13 miles (21 km) east-northeast of Eureka. The boulder has five planed sides and bears glacial markings (Wooster 1888). This is thought to be the boulder now set in the Wooster monument beside Wooster Lake at Emporia State University (Fig. 1).



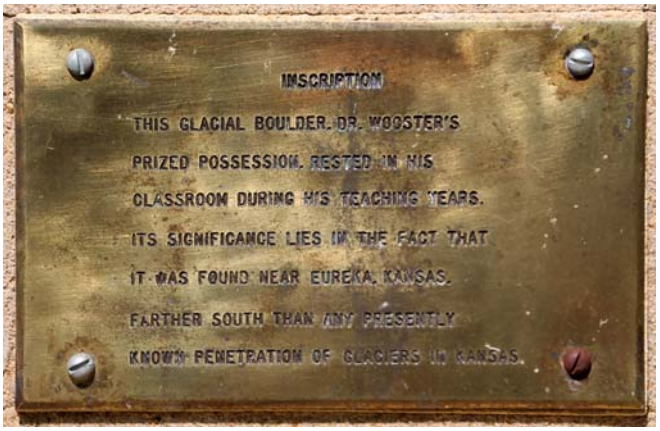


Figure 1. Monument to L.C. Wooster on the campus of Emporia State University (left). Detail of plaque on top of the monument (above, right), and plate on front of the monument (bottom, right). Photos by the author (2012).

Wooster culminated this first phase in his Kansas career as the superintendent of the Kansas educational exhibit for the World's Fair at Chicago in 1893 (Blackmar 1912). Then, for unknown reasons, he relocated northward where he held the Chair of Natural Sciences at the North Dakota State Normal School (1893-1895). He attended the University of Chicago in 1897 where his mentor Chamberlin was Chair of the Department of Geology. In that same year, he received an honorary Ph.D. degree from Milton College (Blackmar 1912; Breukelman 1963).

In 1897, Wooster joined the faculty at Kansas State Normal School (KSN). As of 1889, KSN had become the largest institution of higher education in Kansas, and, in fact, it was the largest normal school in the United States if not the world (Hanschu 2013). The term "normal school" was widely used in the nineteenth century to describe colleges providing the education of public school teachers. Wooster took charge of the Department of Natural Sciences which included botany, geography, geology and zoology, although he quickly renamed it the Department of Biology and Geology (Breukelman 1963).

Wooster's early initiatives included planning a new science building which was approved by the state legislature in 1905 and completed in 1907. Norton Science Hall was named for Henry B. Norton who was the first instructor of natural sciences at KSN (Fig. 2). Also in 1905, the state legislature approved granting of the baccalaureate degree, which placed Kansas State Normal School at the college level. In 1923, the institutional name was changed to the Kansas State Teachers College to reflect this elevated status, and the name was changed eventually to Emporia State University in 1977.

Figure 2. Norton Science Hall as it appeared near the end of Wooster's life. Completed in 1907, it faced south on 12th Avenue just south of present Roosevelt Hall. It continued to be used by biology faculty until 1968, after which it was demolished (ESU Libraries & Archives 2013). The vehicle parked in front is a 1947 DeSoto. From the Ward family collection; used with permission.

Figure 3. Plumb Hall, the main administrative building at Emporia State University (left). Plumb Hall received a complete remodeling and renovation in the 1990s. It retains the original Kansas State Normal School (KSN) logo that was added to the crest of Plumb Hall in 1917 (Hanschu 2013). Photos by the author (2012).

Some confusion is evident concerning the original name; however, as *Kansas State Normal, Kansas Normal School* and *Kansas State Normal School* are all mentioned in various sources (e.g. Blackmar 1912) including Emporia State University's current online history (ESU 2013a, b). It appears that **Kansas State Normal School** was the official name with the abbreviated initials KSN, as they appear on Plumb Hall (Fig. 3; Hanschu 2013). As the school grew and more courses were added, other variants of the name came into common use (M. Franklin, pers. com. 2013).

In addition to his administrative duties, Wooster continued to teach; he was responsible for training elementary and secondary teachers in the natural sciences. He wrote several geological and biological books intended mainly for teaching purposes, of which *The Geological Story of Kansas* (Wooster 1900) is probably the most significant. This book is now available online in the public domain through the American Library Internet Archive. He remained chair of the department until 1928, and finally retired from the faculty in 1938. His career in Emporia lasted more than four decades; thus, he had great influence on two generations of Kansas geology and biology public-school teachers.

Wooster's Kansas geological contributions

By his own admission, fossil collecting was Wooster's greatest love, and he pursued it vigorously in Kansas and across the United States (Fig. 4):

> Your speaker's [Wooster's] own craze for collecting has led him to load his cabinets with fossils; he is very proud of the fact that he has collected fossil invertebrates and vertebrates from Massachusetts to California, and in every rock group from the Potsdam sandstone [basal Cambrian] to the Tertiary—in all 700 or 800 species of fossils and 200 or 300 species of rocks and minerals. (Wooster 1905, p. 27-28)

The term "cabinet" referred to his collection of specimens for teaching and research purposes. Wooster's geological field work in Kansas included two main areas, glaciation and gravel deposition.

- Glaciation of northeastern Kansas – The glacial origin of pink and red boulders in northeastern Kansas was first recognized by Louis Agassiz during a trip in 1868 across the western plains region (Aber 1984). Wooster (1888, 1892, 1913) described striations, moraines, buried forest beds, and diverse types of erratic boulders (Fig. 5). He noted pronounced effects of weathering in contrast to fresh glacial deposits of Michigan.

- Chert gravel of east-central Kansas – Wooster described gravel capping high terraces and hill tops eastward of the Flint Hills-source cherty limestones (Fig. 6). His early interpretation was a "residual peneplain" (erosional plain) on which gravel deposits were left as the Flint Hills eroded and retreated westward (Wooster 1914).

Later, Wooster (1934) developed a more elaborate hypothesis of glacial flooding. He proposed that the ice sheet in northeastern Kansas had blocked the Republican and Smoky Hill rivers and forced water to back up and spill across central Kansas into the headwaters of the Cottonwood drainage basin. He interpreted chert gravels as deposits of these floods. Granite boulders and other erratics supposedly were transported by these floods from glacial sources (Fig. 7). This

Figure 4. Wooster holding one of his prized fossils (left), a giant eurypterid (extinct sea scorpion) that he collected near Buffalo, New York. The house in the background was Wooster's home at 1017 Union Street in Emporia, Kansas. Close-up detail of the fossil (right). Wooster's label gives the species as *Eurypterus pachycheirus,* which is found in Silurian strata (~440 to 410 million years ago) of New York and Ontario. A closely related species, *Eurypterus remipes,* is the state fossil of New York (NYSL 2009). The current status of this magnificent fossil is unknown. The age of the pictures is unknown, but they probably date from early 1900s; photos courtesy of P. Johnston.

Figure 5. Large boulder of Sioux Quartzite weighing ~20 tons displayed in Wamego city park, Pottawatomie County. Sioux Quartzite was derived from southwestern Minnesota and southeastern South Dakota; other erratic stones include granite and various crystalline rocks transported from farther north. Photo by the author (2011).

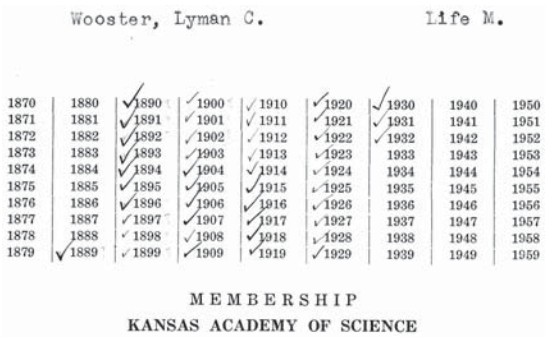
was Wooster's best attempt to explain erratic granite boulders near Eureka, but glacial flooding, as he proposed it, has been proven completely impossible (Aber 1997). The origin of these granite boulders still remains a mystery. Nonetheless, he made a remarkably good estimate for the age of glaciation in Kansas at half a million years ago. The best current dates are between 600,000 and 700,000 years old (Aber 1991).

Other contributions of Wooster

Wooster joined the Kansas Academy of Science in 1889, and he remained an active member and published frequently (Fig. 8). He served as vice-president in 1898, 1901, and 1904, and he was president in 1905. From 1926-1929, he served again as vice-president and then president.

Figure 6. Chert gravel deposits on high terraces on the northern side of the Neosho River valley in eastern Lyon (left) and western Coffey (right) counties, Kansas. Scale pole marked in feet; photos by the author.

Figure 7. Selection of erratic quartzite pebbles collected from a chert gravel deposit in southern Butler County, Flint Hills region. Wooster believed such erratics were carried by glacial melt-water floods from the northeast; however, they were transported by streams draining eastward from the High Plains and Rocky Mountains (Aber 1992). Photo by the author.



Wooster, Lyman C. Life M.

1870	1880	✓1890	✓1900	✓1910	✓1920	✓1930	1940	1950
1871	1881	✓1891	✓1901	✓1911	✓1921	✓1931	1941	1951
1872	1882	✓1892	✓1902	✓1912	✓1922	✓1932	1942	1952
1873	1883	✓1893	✓1903	✓1913	✓1923	1933	1943	1953
1874	1884	✓1894	✓1904	✓1914	✓1924	1934	1944	1954
1875	1885	✓1895	✓1905	✓1915	✓1925	1935	1945	1955
1876	1886	✓1896	✓1906	✓1916	✓1926	1936	1946	1956
1877	1887	✓1897	✓1907	✓1917	✓1927	1937	1947	1957
1878	1888	✓1898	✓1908	✓1918	✓1928	1938	1948	1958
1879	✓1889	✓1899	✓1909	✓1919	✓1929	1939	1949	1959

MEMBERSHIP
KANSAS ACADEMY OF SCIENCE

Figure 8. Wooster's Kansas Academy of Science membership card indicating Life Membership status. Faint pencil check and question marks are visible for the interval 1889-1902, but these are overprinted by ink check marks from 1889 to 1932. Kansas Academy of Science archive; 3 x 5-inch index card.

L.C. Wooster's eldest child, Lyman Dwight Wooster (b. 1884), followed in his father's footsteps. L.D. joined the faculty of the Western Branch of Kansas State Normal School in Hays, Ellis County in 1909, and he eventually became the fourth president (1941-1949) of the renamed Fort Hays Kansas State College, now Fort Hays State University (FHSU 2012).

L.C. Wooster became Professor Emeritus from Kansas State Teachers College in 1935, and he remained active through the late 1930s. He was then living at 1017 Union Street in Emporia. He died in Emporia in 1947, having lived nearly a century. Today his contributions are remembered in place names on the ESU campus—Wooster Lake and Bridge, Wooster Drive (Fig. 9). What became of his impressive fossil collection is unknown. Perhaps some specimens still reside in the ESU Johnston Geology Museum archives, but most were likely dispersed elsewhere.

References

Aber, J.S. 1984. History of Kansas glacial geology. Earth Sciences History 3, p. 134-142.

Aber, J.S. 1991. The glaciation of northeastern Kansas. Boreas 20, p. 297-314.

Aber, J.S. 1992. Chert gravel, drainage development, and sinkholes in the Walnut basin, south-central Kansas. Kansas Academy of Science, Transactions 95, p. 109-121.

Aber, J.S. 1997. Chert gravel and Neogene drainage in east-central Kansas. Kansas Geological Survey, Current Research in Earth Sciences, Bulletin 240, part 3.

Ancestry 2012. Lyman Child Wooster: Family tree. Accessed online <http://trees.ancestry.com/tree/7058720/family?cfpid=1332219149> September 2012.

Blackmar, F.W. (ed.) 1912. Kansas: A cyclopedia of state history, embracing events, institutions, industries, counties, cities, towns, prominent persons, etc. ... / with a supplementary

Figure 9. Wooster Lake (left) at the center of the Emporia State University campus with dormatory buildings in the background. The lake began as a small pond in 1904-1905 and provided a water supply for fire protection. In 1917 it was enlarged and stabilized with a dam. At that time, it was named for Prof. Wooster who had used the pond to teach about fish and plant life (Hanschu 2013). Additional dams and embankments were constructed in 1922 and 1936. Wooster Bridge (right) was built across the lake in 1928 to carry steam pipes from the physical plant and to allow pedestrian traffic; it was restored and rededicated in 1999. Photos by the author (2012).

volume devoted to selected personal history and reminiscence, volume II. Standard Pub. Co. Chicago: 1912. 3 v. in 4.: front., ill., ports.; 28 cm. Transcribed July 2002 by Carolyn Ward. Accessed online <http://skyways.lib.ks.us/genweb/archives/1912/w/wooster_lyman_child.html> January 2013.

Breukelman, J. 1963. The First One Hundred Years (1863-1963) of the Division of Biological Sciences, Emporia State University. Accessed online <http://www.emporia.edu/biosci/general-information/history-1863-1963.html> January 2013.

Chamberlin, T.C. 1882. Preliminary paper on the terminal moraine of the second glacial epoch. United States Geological Survey, Annual Report III, p. 291-402.

Chamberlin, T.C. 1886. The rock-scoring of the great ice invasions. United States Geological Survey, 7th Annual Report III, p. 147-248.

Emporia State Univerity (ESU) 2013a. All about Emporia and Emporia State! Accessed online <http://www.emporia.edu/about/> January 2013.

Emporia State Univerity (ESU) 2013b. Former presidents of Emporia State University. Accessed online <http://www.emporia.edu/about/past/> January 2013.

ESU Libraries & Archives 2013. In the center of it all: A photographic history of the ESU campus from the Walter M. Andersen Collection. Accessed online <http://www.emporia.edu/libsv/archives/gallery/in-the-center-of-it-all-gallery.html>January 2013.

Faul, H. and Faul, C. 1983. It began with a stone: A history of geology from the Stone Age to the age of plate tectonics. J. Wiley & Sons, New York, 270 p.

Fort Hays State University (FHSU) 2012. History of Fort Hays State University: Presidents. Accessed online <http://www.fhsu.edu/about/fhsuhistory/Presidents/> January 2013.

Hanschu, S. 2013. Emporia State University. The Campus History Series, Arcadia Publishing, Charleston, South Carolina, 127 p.

New York State Library (NYSL) 2009. New York State Fossil - *Eurypterus Remipes*. Accessed online <http://www.nysl.nysed.gov/emblems/fossil.htm> January 2013.

Wooster, L.C. 1884. Transition from the Copper-Bearing Series to the Potsdam. American Journal of Science, 3rd series, 27, p. 463-465.

Wooster, L.C. 1888. The limit of drift (in Kansas). Science 12, p. 132.

Wooster, L.C. 1892. Glacial striae in Kansas. American Geologist 10, p. 131.

Wooster, L.C. 1900. The geological story of Kansas. Crane & Co. Publ., Topeka, Kansas, 139 p. Accessed online in the public domain from American Libraries Internet Archive <http://archive.org/details/geologicalstory00woosgoog> January 2013.

Wooster, L.C. 1905. Presidential address: The development of sciences in Kansas. Kansas Academy Science, Transactions 20/1, p. 23-41.

Wooster, L.C. 1913. Notes on the moraine of the glacier southwest of Topeka. Kansas Academy Science, Transactions 25, p. 43-44.

Wooster, L.C. 1914. The chert gravels of eastern Kansas. Kansas Academy Science, Transactions 27, p. 58-62.

Wooster, L.C. 1934. The chert gravels of Lyon County, Kansas. Kansas Academy Science, Transactions 37, p. 157-159.