

RAGBRAI Geo-pedia

Crinoids Galore!

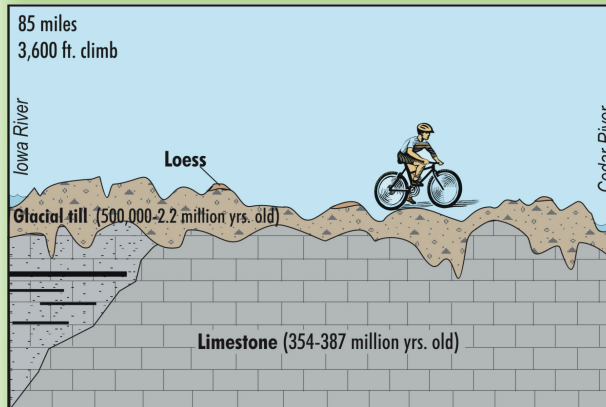
Since the 1860's limestone has been quarried north of the small town of Le Grand, Iowa. The quarry, which is located southeast of Marshalltown and less than three miles off your route (County Highway E35 to Zeller Avenue), sits on the northern banks of the Iowa River and exposes bedrock of **Mississippian Age**. A small boy who lived on a farm adjacent to the quarry found a deep interest in fossils while searching the scrap piles. That young boy was Dr. B. H. Beane, a self-taught paleontologist who discovered a particular deposit within the **Le Grand Quarry**, where 350 million year old fossils were nearly perfectly preserved. The majority of the fossils in the quarry belong to the *Crinoid* family, commonly known as "sea lillies". The amazing deposit is thought to represent a depression in the floor of an ancient sea where these sea lillies accumulated after death. During the latter part of the 19th century and the first half of the 20th, some of the world's most exquisite crinoid fossils were collected from Le Grand, Iowa.



Iowa Limestone Producers Association

COVER PHOTO: Broad shallow valleys and abundant glacial boulders are typical of the Iowan Surface; as seen in this southeastern Black Hawk County field. "Landforms of Iowa" (photo by Patricia J. Lohmann)

Day 5 Milestones



Start: Marshalltown

Iowa River: 3.5 miles

Iowan Surface: 3.5 miles

Limestone quarry: 47.5 miles (southeast of Garrison)

Palo Nuclear Plant: 74.5 miles (2.5 miles north of Palo)

Finish: Cedar Rapids – 85 miles



For More Information...

USNRC - Duane Arnold Energy Center

<http://www.nrc.gov/info-finder/reactor/duan.html>

Water Quality Improvement Plan - McCloud Run

http://www.epa.gov/waters/tmdl/docs/33136_mcCloud.pdf

USGS National Streamgaging Network

<http://waterdata.usgs.gov/nwis>

USGS WaterAlert is a program that allows you to select the parameters you are interested in for a specified river or stream across the country! To have the information sent directly to you via text or email go to:
<http://water.usgs.gov/wateralert/>

40th RAGBRAI 2012

Learn about the Land

Thursday, July 26

Day 5



Iowa DNR – Geological and Water Survey

109 Trowbridge Hall

Iowa City, IA 52242

www.igsb.uiowa.edu

US Geological Survey - IA Water Science Center

400 S. Clinton St.

Iowa City, IA 52240

<http://ia.water.usgs.gov>

Iowa Limestone Producers Association

5907 Meredith Dr., Suite A

Des Moines, IA 50322

www.limestone.org

Data Streams

As you travel any road in the country near a river or stream, you have probably seen small buildings with a USGS sign that is topped with solar panels and satellite dishes. Those are part of the **USGS national streamgaging network**. The USGS operates approximately 7,500 gages, 171 in Iowa. The data collected are used by a variety of public and private users such as government agencies, researchers, and recreational enthusiasts. Traditionally, the public is most aware of these gages during times of flooding when the National Weather Service relies on streamflow information to help them make flood predictions.

Mt. Trashmore

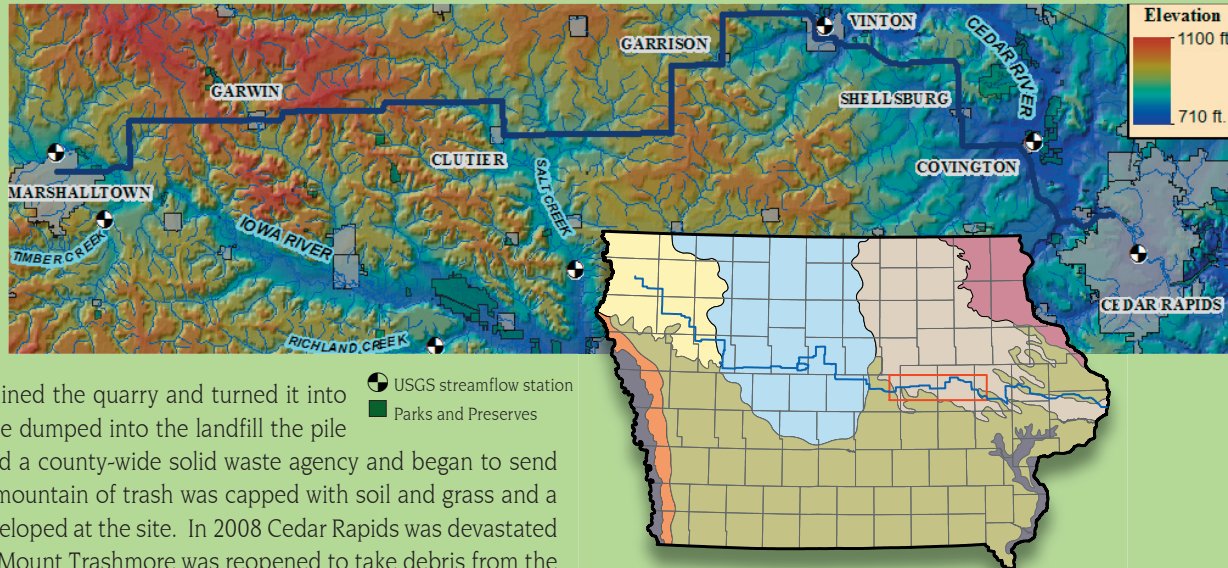
The high point in the downtown area of Cedar Rapids is a man-made mountain informally known as Mount Trashmore. The mountain started out as a hole in the ground, the Otis Quarry, which was operated by Concrete Materials for production of limestone. In 1965 the City of Cedar Rapids obtained the quarry and turned it into a municipal **landfill**. As solid waste dumped into the landfill the pile grew until 1994 when the city joined a county-wide solid waste agency and began to send its refuse to a county facility. The mountain of trash was capped with soil and grass and a **methane** collection facility was developed at the site. In 2008 Cedar Rapids was devastated by flooding of the Cedar River, and Mount Trashmore was reopened to take debris from the flooding. The facility accepted over 100,000 tons of materials from flood damaged properties until it was closed in the spring of 2012. Mount Trashmore currently reaches a height of over 200 feet above the adjacent Cedar River. Numerous proposals have been advanced for future development of Mount Trashmore, including hiking and biking trails and ski slopes complete with a lodge.



Iowa's only nuclear power plant, the **Duane Arnold Energy Center (DAEC)** is located 2.5 miles north of downtown Palo along the Cedar River. This facility generates enough electricity to power more than 600,000 homes annually (615 Megawatts). The DAEC took 40 months and \$300 million to build and was brought online in February 1975. Full production capacity for the plant was achieved in 1985 after several modifications. The DAEC was recently granted a 20 year extension on its license, allowing operation to continue until 2034. The plant is constructed 20 feet above the elevation of the Cedar River and is located in a low risk seismic zone. Even during the historic flood of 2008, the river remained 14 feet below the elevation of the plant. The Nuclear Regulatory Commission (NRC) designates a zone within 10 miles of the plant where airborne fallout is a direct threat for people and the environment through contact and/or inhalation. About 108,000 people



live within 10 miles of the DAEC including the towns of Palo, Atkins, Cedar Rapids, Shellsburg, Center Point, Urbana, Robins, and Hiawatha. The DAEC occupies a 500 acre site that includes natural habitat and farmland. The Pleasant Creek Reservoir was constructed northwest of the plant to provide cooling water during times of low flow in the Cedar River.



McCloud Run is Iowa's only urban trout stream – located in the heart of Cedar Rapids, this spring-fed stream has conditions cold enough to support a trout population. However, during the 1990s, repeated fish kills resulted from thunderstorms that allowed heated water from pavement, parking lots, and roofs to runoff to enter the stream causing thermal shock to the fish. A local water quality project constructed ponds to hold back the superheated stormwater and release it slowly to the stream to prevent fish kills. Construction of fish "hides" within the creek bed allows fish to take refuge in deeper, colder water during the storms. Local landowners also installed dozens of raingardens in their backyards to help protect and improve this unique little stream.

Unforgettable Flood

Today, you'll be biking through the Cedar River watershed, one of the areas hit hardest by the **Iowa flood of 2008**. In Cedar Rapids, the Cedar River was over flood stage for more than 10 days. At its peak, the river level was over 30 feet (18 feet over flood stage) with a flow of 130,000 cubic feet of water per second (cfs). Think of one cubic foot as approximately the size of a basketball – 130,000 basketballs flowing past you every second!