

Exploring Public Engagement With Real-Time Experimentation in Different Public Venues

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SCIENTIFIC BACKGROUND

In 1953, chemist Stanley Miller demonstrated that it was possible to produce amino acids by adding heat and electricity to a mixture of ammonia, methane, hydrogen and water vapor.

We have updated and aesthetized the apparatus used by Miller to carry out new experiments by recreating a primordial "ocean", adding minerals and permitting replenishment of gases and liquids.

GOALS

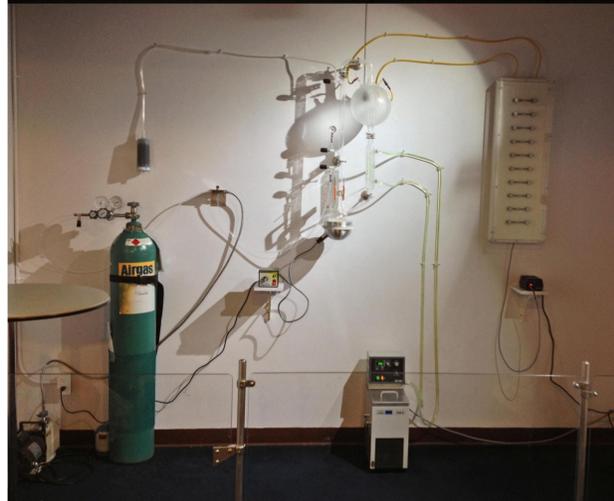
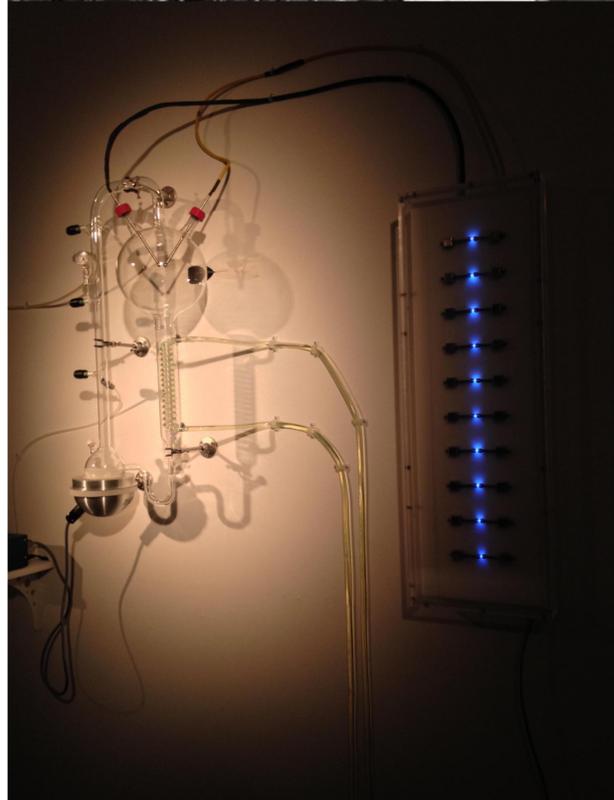
GOAL 1) To explore new ways to attract public interest in science by performing previously untried novel variations of the Miller experiment, in real-time, in public settings with an onsite performance component

GOAL 2) To explore how venue affects visitor profiles and responses with regard to prior science and art experiences by installing an identical apparatus in science, art, and art-science venues

GOAL 3) To explore the problems associated with data transformation as a means to communicate experimental results to both scientific and non-scientific (especially artistic) audiences.

METHODS

- 1) Perform novel Miller-type experiments in public venues
- 2) Use trained volunteers to draw samples and perform simple tests on them (ninhydrin for presence of amino acids; luciferin-luciferase for ATP; pH)
- 3) Use mass spectrometry, capillary electrophoresis and UV spectrometry to analyze samples
- 4) Transform data into artistic forms for public presentation
- 5) Survey visitors about artistic and scientific educational backgrounds; number of art and science venues visited per year; impact of exhibit; number of visits to exhibit; interest in viewing similar, live experiments in a similar venue



VENUES

- 1) Michigan State University Art Museum
- 2) Michigan State University Science Museum
- 3) Reuben Fleet Science Center, San Diego
- 4) Beall Center for Art and Technology, UC Irvine
- 5) Williamson Art Gallery, Art College School of Design

EDUCATIONAL OUTCOMES (Goals 1 and 2)

127 surveys from 4 venues: 52 from arts venues; 75 from science venues

- 1) Visitors to the exhibit made three times more visits to art museums or art galleries in the past five years than to science museums.
- 2) Half or the respondents to our survey (95% of those answering the question) would like to see other live experiments in the spaces where we exhibited,
- 3) 30% of the respondents were repeat visitors to our exhibit within a four week period
- 4) People visiting arts venues much less likely to visit science centers than those visiting a science venue
- 5) People visiting arts venues as likely to be scientists and engineers as artists

FAILURE (Goal 3)

Proved impossible to obtain samples, analyze and convert them into artistic forms and return them to the venues efficiently.

SCIENTIFIC OUTCOMES

- 1) Replenishment of gases and liquids vastly increased amino acid yields
- 2) Pentose and hexose sugars produced
- 3) ATP produced (femtomolar concentrations)
- 4) Possible evidence of lipids and steroids

FUNDING

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ADDITIONAL RESOURCES:

Website: <http://adamwbrown.net>