

Historic Southern Indiana

Interpretation Workshop, March 2-4, 1998

Beams from the Past

Presented By Scott Beam

Artificial Lighting in American History

ABSTRACT: The scientific development of artificial lighting has occurred roughly at the same time span of the founding and growth of the United States. This is a brief introduction to developments in artificial lighting and their historical, environmental and social relevance.

Centuries of Inadequate Artificial Light

Throughout the history of humankind there has been at times impressive mastery over natural resources to benefit people. Ships have carried humans around the world. Rocks and trees have been fashioned into magnificent structures. Crops and livestock were domesticated to better feed everyone. However, most of these great feats have had to occur during daylight hours since no one could master sunlight after sunset.

Fire has for thousands of years been the substitute for sunlight. Though wood and various oils have been used since before the time of Jesus Christ, animal grease was often the fuel of choice for night illumination. Fire, however, is smokey and requires tending to make it useful. This fire principle of artificial light, though thousands of years old, was still in common use on the eve of United States independence. These grease, or "betty," lamps were not necessarily intended to extend the work day. They best functioned to prevent a stubbed toe on the way to the bed chamber.

Early Improvements in Household Illumination

The history of artificial lighting changed forever as a result of the 1787 English patent by John Miles. His innovation was to have a sealed reservoir for the oil which would not spill if upset. This was near the same time that whale oil was discovered to burn brighter than other types of animal grease. The Miles Patent lamp was a breakthrough which caught on in America. Inventors galore started experimenting to see if they too could brightly illuminate the world in a manner unknown for the previous few thousand years. Patent abstracts are full of their experiments. They tried alternate fuels, different wick shapes and quantities, and various adjusting mechanisms. One of the more successful, though short-lived, fuel experiments in the West (known as the Mid-West in the Twentieth century) was camphene, also called burning fluid. Whale oil was prohibitively expensive, since whales are hard to come by in Indiana. Trees, however,

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were more than abundant to make turpentine. After additional refining it becomes camphene which burns as bright as whale oil. There, unfortunately, was a camphene problem. If a spark fell into the font, camphene had a tendency to explode. After many homes and lives were lost camphene was to be avoided.

This era of experimentation, 1820-1845, saw enough desirable grease-burning alternatives created that folks tended to stay up later. This was generally to read, write, sew and do other stationary tasks, since the intensity of light still did not go far beyond its source.

In 1849, building upon the discovery of petroleum and the invention of coal oil (kerosene) ten years previously, kerosene made from petroleum was found to burn brighter and cheaper than other oils available. By the eve of the Civil War kerosene was rather common-place and lamps to use it in were well-developed enough to extend one's lifestyle well past sunset without interruption. It still had its drawbacks; it smelled bad, created soot, had to be refilled and needed a match to be lit, therefore the experiments continued.

A Superior Form of Light

The major breakthrough in artificial lighting occurred when electricity was harnessed. In 1879 Thomas Edison successfully used electricity to get light. Although it required another 50-60 years for electricity to be available to everyone, this became and still the most widely used form of artificial lighting. After decades of development, electric lights are bright enough to finally achieved the goal of light as bright as the sun after sunset.

Environmental Consequences

Although electricity is superior in its illumination and is drastically healthier than previous lights, it does not come without a drawback. It contributes to environmental detachment. The convenience of a wall mounted switch can make it easy to overlook that fuel is still being spent to make the light possible. Our forbearers, up to and even including this century, had to make do with limitations on their daily activities according to available light. Contemporary lifestyles, through technology, no longer have this limitation and we are finding it much easier to be wasteful.

Previous forms of light that required tending gave an incentive to consider things before striking a match, such as; is it dark enough to use this? Does the whole house need to be lit, or just this spot? Is there enough fuel for the light? Do I really feel like refilling the lamp right now? Questions are still appropriate today. Judging how much light is necessary and using only that much would dramatically lessen energy use the world over.

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Sunlight After Sunset

A final lighting wonder that has only become practical in the past two decades is photovoltaic or solar cells. Put them in the sunlight and they directly convert sunshine into electricity. Store the electricity in a battery, then use it later to power a light. In this sense we can truly have healthy and economical sunlight after sunset.

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