

# And He Lighted the Lamps

—Exod. 40.25.

By Robert H. Moulton

**W**HEN the world was young and civilization was in the learning-to-walk stage of its development primitive man realized a need for something which would enable him to finish the task arrested by darkness. Of that need artificial illumination was born. All through the ages they have come together, civilization and lighting. Every forward step in the progress of culture has been marked by an advance in illumination. The way to our civilization of today lies parallel to the way to better light.

A stick from the fire was no doubt the first lighting unit, for when man in the earliest ages made nocturnal excursions into the surrounding gloom and needed illumination, he snatched up a piece of burning wood from the camp-fire. Yet there is plenty of evidence that crude forms of oil-lamps came into use long before history was begun. Shells and hollow stones, even the skulls of animals, were filled with oil, extracted from olives, nuts or vegetables, and this oil, burning without a wick, furnished a feeble, flickering light accompanied by an unpleasant odor.

In the course of time some one thought of a wick, and the earliest form of this improvement in illumination was a floating wick of moss or fiber. In the Orkney islands the stormy petrel, with a wick in its bill is used as a candle today. The carcass of an oil fish is similarly used in Alaska. Candles were preceded by splints, but both were used during the same period. Gas illumination was the next step, appearing less than a century before the electric lamp proved commercially successful.

In the ruins of Fara, Babylonia, 3,000 B. C., was found the earliest stone lamp of which there is any record. This was merely a crude saucer-shaped affair, about four inches in diameter, cut from alabaster. An improvement over the stone lamp was the pottery lamp, which could be more easily shaped, and specimens of around 300 B. C., have been found. A form called the "Virgin's lamp," used in Bible times consisted of a small hollow vessel, with an opening in the top for the wick, which could be carried in the hand. Within the next half century, about 200 A. D., these pottery lamps had been greatly improved in appearance, for by then they had begun to assume regular forms, with handles and some attempt at decoration. Two hundred years later bronze lamps made their appearance. A modification of this type, known as the Florentine lamp, which could be suspended by chains, followed a few hundred years later.

In the early part of the fifteenth century, about the time that Columbus was discovering the Americas, the Venetian stand lamp was widely used in the Mediterranean countries of Europe. Its graceful and artistic utility is characteristic of the Renaissance during which it was in vogue.

The Flemish oil lamp, 1,600 A. D., forms as sharp a contrast to the Venetian lamp as does the Reformation period, of which the former was a development, to the Renaissance period of the latter. Lamps of this type may still be found in use among the poorer classes of continental Europe.

The candle is really a form of oil lamp in which the oil or grease in solid form is melted by the flame as it is used. It was formerly made from animal fats, but is now made of wax from berries and paraffin. Whale oil was the chief illuminating oil for many years. Benjamin Franklin discovered that two wicks gave more than twice the light of one, and this led to the Franklin double-burners. Camphene, a patent fluid used about 1850, was a

mixture of turpentine and alcohol. It gave a much brighter light than whale oil, but was dangerous on account of its explosive nature, and consequently was never very popular.

Kerosene was first procurable in commercial quantities about the time of the Civil war, and the ordinary kerosene lamp is still the chief illuminant in territories where electricity and gas are not as yet available.

In 1879 came the "incandescent" electric lamp invented by Thomas A. Edison. In the autumn of 1877 Edison announced his intention immediately to devote himself to the problem of producing a commercially practicable electric lamp.

His triumph came on October 21, 1879. On that date, after persistent labor, Edison succeeded in carbonizing a piece of cotton sewing thread bent into a loop of horse-shoe shape. This he sealed in a glass bulb which had been exhausted until a very high vacuum was produced. For forty hours after the circuit was closed, the brightly incandescent filament remained intact.

Not being satisfied with this form of filament Edison began to carbonize everything in nature that he could think of. He wanted a material that, when carbonized, would be uniform and homogeneous. As he looked

around his laboratory one day, he saw an ordinary palm leaf fan upon a table. After a study of the texture of the binding, he asked one of his assistants to carbonize filaments made from the rim. He was so impressed with the result of this experiment that he sent men all over the world to secure specimens of bamboo. A certain variety of Japanese bamboo was finally adopted, and for nearly nine years all Edison lamps had bamboo filaments.

In 1907, the pressed tungsten lamp was placed on the market, but scientists did not stop here; the goal was ductile tungsten. Tungsten is not a rare metal, but it was not largely used owing to the fact that no method had been discovered by which its natural hard and brittle state could be changed. Tungsten is now produced in a ductile form and can be drawn into a wire which has a tensile strength varying from 400,000 to 500,000 pounds a square inch.

In 1911, the wire-drawn lamp with which we are all familiar made its appearance. This lamp, which gives three times as much light as the carbon lamp, contains a filament of drawn tungsten wire within a bulb of clear glass from which the air has been exhausted. In 1914 the gas-filled lamp was produced.

## NEW MEMORIAL TO GRANT



**A**PRIL 27, 1922, Ulysses Simpson Grant was born in Point Pleasant, Clermont county, Ohio. The one hundredth anniversary of his birth will be observed in Washington by the unveiling of a statue in the botanical gardens. There will be elaborate ceremonies. Vice President Coolidge will be the principal speaker. The photograph shows the Grant statue, with the capitol dome in the background.

The completed memorial is the result of twenty years' effort by the designer and sculptor, Henry Merwin Shrady of New York, whose father, Dr. George F. Shrady attended President Grant up to the time of his death.

The work is pyramidal in outline, with all the minor figures and groups sweeping up to the central character, General Grant sitting astride his horse in the center of the memorial. At the opposite ends are two groups, one a cavalry detail going into action, and the other a field battery going into action. Each group faces the central figure.

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**Recommends the Vegetable Compound**

New Orleans, La.—"I have found relief from my troubles by taking Lydia E. Pinkham's Vegetable Compound and I praise it wherever I go. I could not do my work as it should be done for I would sometimes have to lie down because of the pains I had. A friend induced me to take your Vegetable Compound and I have got great results from it. I keep house and am able to do all my own work. I recommend your Vegetable Compound to my friends who have troubles similar to mine."—Mrs. T. FORTNER, 1915 N. Derbigny St., New Orleans, La.

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