low, straw, and rose. They are found with zircons, platinum, iridium, and other associates of the diamond. They are also found in connection with itacolumite, that peculiar flexible sandstone which is likewise native to North Carolina. So far as known, $500 is the highest price ever paid for any California diamond in the rough. Large numbers, however, have been sold for from $10 to $50, and not a few have brought as much as $100. Among the sapphire gems, a number of excellent specimens have been found, particularly in North Carolina. Probably one of the finest known specimens of emerald green sapphire was found at Jenks Mine, in Franklin County. It is the transparent part of a corundum crystal, 4 by 2 by 1½ inches. It would probably furnish gems to the amount of 100 carats. Being very rare, its value is over $1,000. Fine specimens of chrysoberyl and spinel have been found in various localities in New England, New York, and the Southern States. The Platte Mountains, in Colorado, have afforded the best crystals of topaz. One of these weighs 125 carats, and is as fine a gem of any kind as America has ever produced. The crystals gathered from this one locality, during a period of fourteen months, have sold for nearly a thousand dollars. Emeralds, beryls, and some of the less commonly known minerals, such as zircon, tourmaline, and staurolite, have been found in small quantities, but have not proved of much importance as gems. In garnets, however, America has produced stones comparable with the best products of Africa and the East. Thoughsmallerthan those found in the diamond mines of the Cape of Good Hope, the garnets of the Colorado River plateau are unsurpassed in color and clearness. The Cape garnets retain their dark color by artificial light, but in the American nothing but the clear blood color is visible. As a mineral they are found all over the United States, wher ever the older formations are exposed, but it is only occasionally that they are sufficiently transparent to rank as gems.

It is in the group of silicates that we find the largest value among American gem minerals. In transparent quartz, particularly fine crystals have been found in New York. The purple variety, the well known amethyst, is quite common in New England, one specimen found near Cheshire, Conn., being almost equal in color to the much praised Siberian gems. Several southern localities likewise afford excellent specimens. The most remarkable native amethyst is that recently deposited in the National Museum by Dr. Lucas. It is a turtle-shaped prehistoric cutting, which measures 2¾ inches in length, 2 inches in width, and 1½ inches in thickness. The whole stone is transparent and without a flaw. Smoky quartz has returned the largest revenue of any of the gem stones, amounting, in 1884, to $10,000. The finest specimens are those from Bear Creek, Colorado, where finely developed crystals, from an inch to over four feet in length, have been found. In many of the specimens, included minerals, such as rutile, asbestos, and gothite, add much to their beauty and value. Quartz crystals containing fluid cavities with moving bubbles are of particular interest, and have been found in a number of localities. There are in addition a large number of less valuable stones, whose beauty still attracts admiration. The beautiful green variety of feldspar known as Amazon stone, which has been found in fine crystals at Pike's Peak, is much prized as cabinet specimens. The numerous varieties of silicified wood have afforded as pretty specimens as can be found the world over. Numbers of minerals also, which have but a nominal value in themselves, are made up into attractive articles. Anthracite is carved and turned into a variety of pretty trinkets, of which $2,500 to $3,000 worth are sold annually. Pipestone, from those red pipestone quarries in Minnesota which are so well known to readers of "Hiawatha" as having afforded the material of the famous peace pipe smoked by Gitche-Manitou, the Mighty, is still used for the same purpose, only that the pipes sell for $1 to $20 apiece, according to the carving, and circulate strictly among mortals.

There are many inducements for a systematic search for precious stones. Though we produced but $28,650 worth of gems proper, we imported during the same year diamonds and other precious stones to the amount of over $9,000,000. A more intimate knowledge of American resources will probably, in time, somewhat reduce this undesirable proportion between the native and imported gems.

Historical Electrical Apparatus.

In a lecture delivered before the Franklin Institute, Philadelphia, Mr. C. J. Kintner, chief examiner of the Department of Electricity, in the United States Patent Office, spoke of a number of notable pieces of electrical apparatus in the possession of the office, and of the wonderful increase in the growth of the business of this department during the past few years.

Prior to the year 1881, electrical apparatus was only a sub-department under the general classification of philosophical instruments. In that year, it was made into a separate class. Since then, the number of inventions has multiplied so rapidly that during the past year the electrical department was given nine classes in place of one. The greatest epoch in the history of the art was in 1876. Before that time, there had been but 1,973 patents taken out for electrical inventions. Since then there have been 8,000 new patents. It was in 1833 that the first patent in this department was granted to D. Harrington, a Philadelphian, for an invention meant to cure disease by an application of electricity. Two more patents were granted to the same inventor for similar devices, but these three were the only electrical patents granted before the regular establishment of the Patent Office, in 1836. Among the most famous of the models in the possession of the Government, Mr. Kintner mentioned Morse's telegraph instrument, which, he stated, was, like all that inventor's models, a marvel of good workmanship and performance. Bell's telephone, the Brush electric light, and many other devices not so well known to the general public, make up a list of inventions upon which large industrial operations have been based and to which our present progress is largely attributable.

THE surplus of the Ætna Insurance Company is now over $3,200,000, which is larger than the capital of any other fire insurance company.

NIGHT SKY—JANUARY AND FEBRUARY.

BY RICHARD A. PROCTOR.

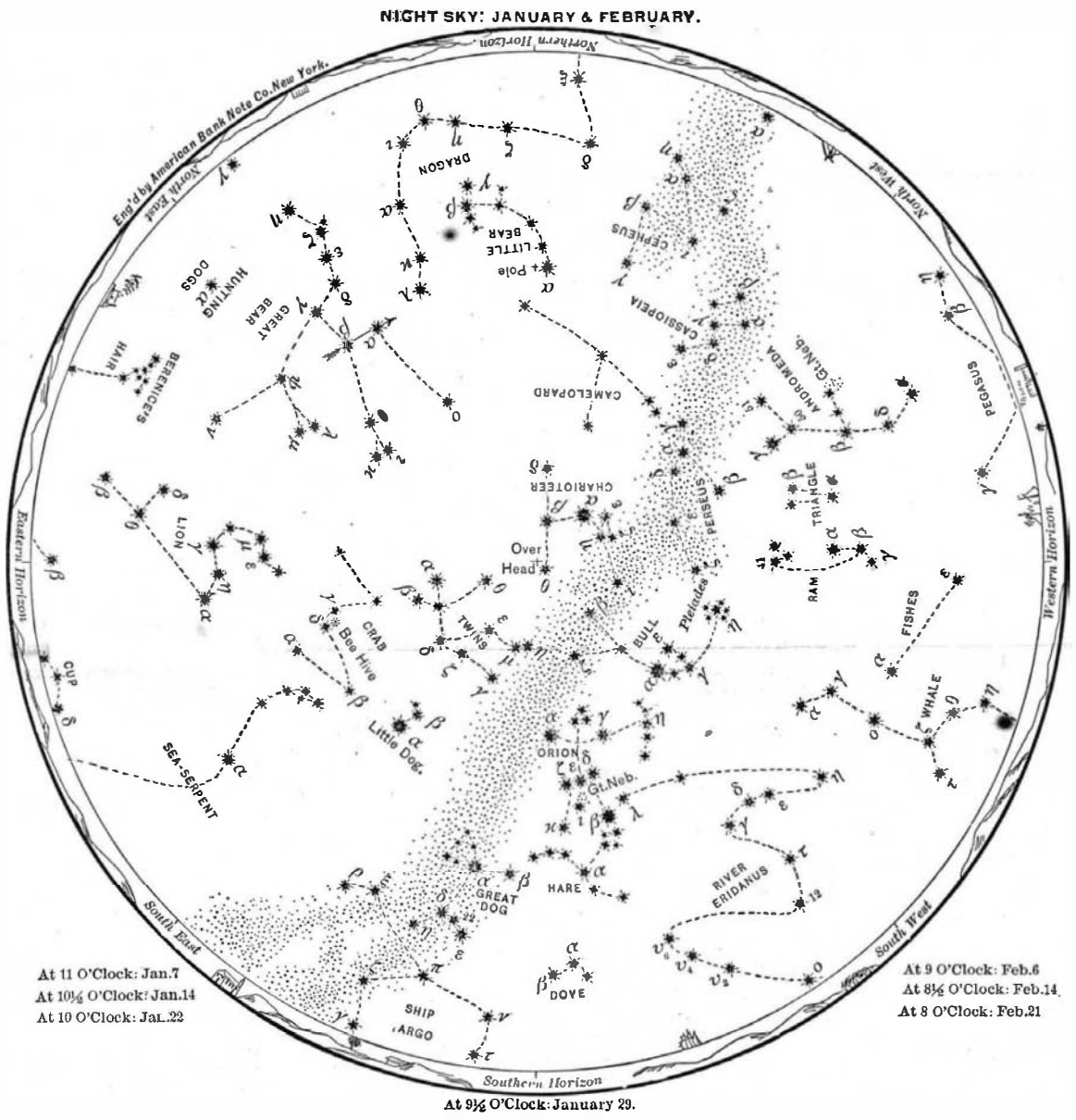
The Great Bear (*Ursa Major*), with its Dipper and Pointers, occupies the northeasterly mid-heaven. A line from the Pole Star (and of the Little Bear, *Ursa Minor*) to the Guardians, β and γ, lies in the position of the minute hand of a clock 18 minutes after an hour. The Camelopard (*Camelopardus*) is above. The Dragon (*Draco*), whose head is below the horizon, curves round the Little Bear to between the Guardians and the Pointers. In the northwest, fairly high up, we find *Cassiopeia*, the Seated Lady, and on her right, lower down, the inconspicuous constellation *Cepheus*. *Andromeda*, the Chained Lady, is on Cassiopeia's left. The Great Nebula will be noticed in the map—it is faintly visible to the naked eye. Above Andromeda is *Perseus*, the Rescuing Knight, and above him the Charioteer (*Auriga*), nearly overhead. On the left of Andromeda is *Aries*, the Ram, the small constellation, the Triangle, lying between them.

Toward the southwest, the Whale (*Cetus*) is beginning to set. The River (*Eridanus*) occupies the lower part of the southwesterly sky, and extends also to the mid-heavens in that direction. The Dove (*Columba*) is nearly due south, and at its best—which is not saying much. Above is the Hare (*Lepus*), on which *Orion* treads. The giant now presents his noblest aspect—prince of all the constellations, as he is. He faces the Bull (*Taurus*), known by the Pleiads and the bright Aldebaran.

Close by the poor Hare, on the left, leaps *Canis Major*, the Greater Dog, with the bright Sirius, which "bickers into green and emerald." The stern of the star ship Argo is nearing the south.

Very high in the southeast we find the Twins (*Gemini*), with the twin stars, Castor and Pollux (α and β); and below them the Little Dog (*Canis Minor*). The Sea Serpent (*Hydra*) is rearing its tall neck above the eastern horizon (by south), as if aiming either for the Little Dog or for the Crab (*Cancer*), now high up in the east, with its pretty Beehive cluster showing well in clear weather. The Lion (*Leo*) is due east, the Sickle (marked by the stars α, η, γ, μ, and ε) being easily recognized.

Queen Berenice's Hair (*Coma Berenices*, not *Berenicis*, as often ignorantly given) is in the northeast. It used to mark the tip of the real Lion's tail, just as the stars of the Crab marked his head. The Hunting Dogs occupy the space between Berenice's Hair and the Great Bear.



In the map, stars of the first magnitude are eight-pointed; second magnitude, six-pointed; third magnitude, five-pointed; fourth magnitude (a few), four-pointed; fifth magnitude (very few), three-pointed, counting the points only as shown in the solid outline, without the intermediate lines signifying star rays.

Cement for Cast Iron.

A correspondent of the *English Mechanic* says that he used the following recipe with the greatest success for the cementing of iron railing tops, iron gratings to stoves, etc., and with such effect as to resist the blows of a sledge hammer: Take equal parts of sulphur and white lead, with about a sixth of borax; incorporate the three so as to form one homogeneous mass. When going to apply it, wet it with strong sulphuric acid and place a thin layer of it between the two pieces of iron, which should then be pressed together. In five days it will be perfectly dry, all traces of the cement having vanished, and the iron will have the appearance of having been welded together.

The American Exhibition in London.

The Executive Council of the American Exhibition Company have announced that the time for the opening of the exhibition has been postponed a year, and that May, 1887, has been chosen as a more favorable time. This change has been made because the Colonial and Indian Exhibition will be held next spring in London, and it is naturally thought that the simultaneous occurrence of the two exhibitions would interfere with the success of the American enterprise. Minister Phelps, Consul-General Waller, and other prominent Americans have advised the postponement.