French Torpedo Experiments.

The *Temps*, of Paris, gives an account of a series of torpedo experiments which have been lately carried out under the direction of the French Minister of Marine, and which, according to that paper, proved far more successful than those performed by the British fleet in Bantry Bay. It would appear that the new minister, Admiral Aube, is desirous of investigating the efficiency of the torpedo service; and with that object he dispatched a number of boats from Cherbourg to Toulon *via* the Straits of Gibraltar, to test their sea-going qualities. The trial was most satisfactory, with one exception; the vessels proved very seaworthy, and passed through the Bay of Biscay successfully. But the crews found their quarters most unpleasant; the continual vibration, the cramped accommodation, the want of fresh air, and the general discomfort were such that after thirty-six hours the men were completely fatigued, and needed to run to port for rest. Hence it seemed proved that such boats were only fitted for operations near their base, and could not be sent on long independent cruises. But when the firing experiments were made, the results were altogether successful. On the 2d of March an attack was made on the ironclad Amiral Duperre, off the Hyeres Islands, under several different conditions. Two torpedo boats, Nos. 58 and 59, were moored by three cables, while the vessel steamed past them at the rate of 14 to 14½ knots per hour. They launched six torpedoes at her at different angles, some directed at the mast, and others at various parts of the ship. All these missiles struck the vessel and exploded their fuses. The next experiment consisted in boat No. 58 meeting the ironclad stem on, the former at the rate of nine knots and the latter at 14½. When a distance of 500 yards separated the two, the torpedo was ejected from its tube, and struck the ship. 11 meters behind the spur, exploding its mimic charge. Two first-class boats, Nos. 63 and 64, were then brought into action. The former advanced toward the bows of the Amiral Duperre at the rate of 12 knots, the large vessel steaming at the same time at 14 knots. The missile again struck, and when the second boat executed a similar maneuver, its projectile only missed by a few yards.

As far as they go, these trials are most satisfactory, and confirm the opinion that the torpedo boat will be the prominent feature in the naval battles of the future. But, says *Engineering*, when our contemporary goes on to suggest that the poorer results obtained in Bantry Bay were owing to the English torpedoes being badly equipped or unskillfully worked, he shows that he fails to appreciate the different conditions of the two cases. He might as well compare the shooting at Wimbledon with the waste of lead in a battle. In the placid waters of the Mediterranean, the torpedo had every advantage; in the first trial, the boats were securely moored, and in the others the speeds were evidently settled beforehand. The whole programme was arranged, and was carried out without hurry or excitement.

But in Bantry Bay there was no indulgence extended to the torpedo. The course of the Polyphemus was not known; she was to make a rush at the boom, but could choose her own direction and speed, so that the officers in charge of the boats had to be on the alert to select the most fitting opportunity, and had at the same time to determine what allowance must be made for speed. No wonder the theory that the wave which preceded the vessel deflected the missiles was advanced, and received great prominence in the newspaper accounts which appeared, a theory which our contemporary declares to be now exploded. If the French Minister of Marine will repeat his experiments under conditions more nearly resembling a battle, he will probably find some new hypothesis advanced to explain the poorer results which will be obtained.

A Magnesium Lamp.

A simple method of producing a powerful magnesium light for experimental purposes is described by a correspondent of the *Photographic News*. It consists of a methylated spirit lamp, the wick of which projects out from the side, near the top, being inclosed in a short spout. The flame of this lamp is made to play upon the bottom of a brass vessel, about the size of an egg-cup, which is intended to contain a mixture of sand and powdered magnesium. There is a small perforation in the bottom of the cup for the continuous escape of the powder, which must be so placed that while it falls into the flame of the spirit lamp, it does not drop upon the wick. The sand-cup arrangement is, in fact, on the hour glass principle. It is essential that the perforated end of the sand-cup should be kept hot by the flame, in order to prevent condensation upon it of water, to which the powder would adhere. A trial will show the required dimensions of the hole in the cup, the proportion of magnesium, and the management of the little apparatus. It is stated, in order to discourage attempts with a very obvious makeshift, that a funnel will not answer in place of the prescribed brass cup, because the neck would become choked with powder and water. The larger the proportion of magnesium that can be satisfactorily burnt in this way, the longer is the flame. With proper management, a magnesium flame 1½ yards long may be obtained. The best way to start the apparatus is to light the spirit lamp first, and then fill the cup with the charge of powder by pouring it in all at once from a sheet of paper, when the metallic flame will forthwith be produced. The same style of apparatus may be found useful for displaying the effects of other powders in a non-luminous flame.

Railroad Tie Plantations.

Hon. R. W. Phipps, Forestry Commissioner of Ontario, in a letter from Southern Kansas to the Toronto *Globe* writes:

"One railroad board here, knowing that the growing of wood, when set about in earnest, is neither a slow nor difficult task, has established in Kansas the largest artificial plantation of forest trees in North America. These railway gentlemen themselves gave out the contract for planting over a square mile of land with young saplings of the catalpa and ailantus; and their president, observing the success of their experiment, and impressed with its probable excellent financial results, has had planted at his own expense, as a speculation, as much more. These are situated near the little town of Farlington, Kan."

NIGHT SKY—MARCH AND APRIL.

BY RICHARD A. PROCTOR.

The Great Bear (*Ursa Major*) is now nearing the point overhead, the Pointers (α and β) aiming almost directly downward toward the Pole Star. The line from this star (α of the Little Bear, *Ursa Minor*) to the Guardians (β and γ) is now in the position of the minute hand of a clock about 13 min. after an hour.

Cepheus lies north, low down, *Cassiopeia* on his left, the Cameleopard above her, *Andromeda* just setting, almost due northwest, on the left. Perseus is due northwest, rather low, the Charioteer (*Auriga*) on his left, but higher. Setting between west and northwest we see the Bull (*Taurus*), with the Pleiades and the ruddy Aldebaran. *Orion* is almost prone in his descent toward his western grave. The Twins (*Gemini*) are due west, in the mid-heavens; the Little Dog (*Canis Minor*) beside them on their left, the Crab (*Cancer*) above, the Greater Dog (*Canis Major*) below, chasing the Hare (*Lepus*) below the horizon. Just behind the Dog the poop of the Great Ship (*Argo*) is also setting.

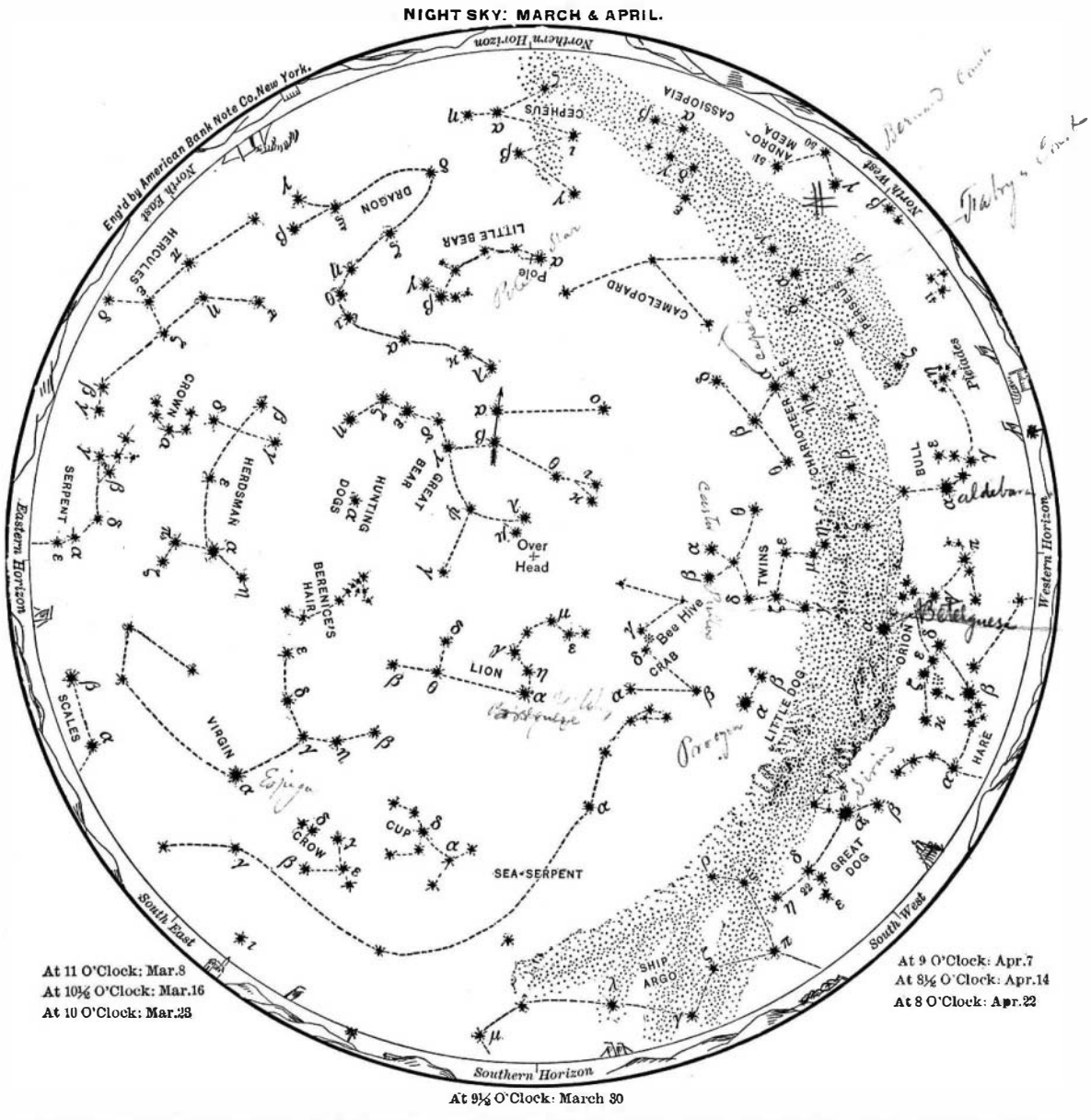
The Sea Serpent (*Hydra*) now shows his full length, rearing his head high in the south. Observe the darkness of the region around his heart, α, Alfard, the Solitary One. The Cup (*Crater*) and Crow (*Corvus*) stand on his back.

The Sickle in the Lion (*Leo*) now stands with handle upright, due south. Below the tail stars of the Lion we see the Virgin (*Virgo*), with the bright *Spica Azimech*. The set of five third magnitude stars above was called by the Arabs, for reasons not explained, the "Retreat of the Howling She Dogs."

Behind the Lion, due east and high up, we see *Coma Berenices*, the hair of Queen Berenice, between which and the tail of the Great Bear we see in the chart one star only of the Hunting Dogs (*Canes Venatici*).

The Herdsman (*Bootes*), still on his back, pursues in that striking and effective position the Great Bear. Below the shoulder stars of the Herdsman we see the Crown (*Corona Borealis*), near which, on the right, low down and due east, the head of the Serpent (*Serpens*) is rising. *Hercules* is also rising, but in the northeast.

Lastly, the stars of the Dragon (*Draco*) can be seen curving from between the Pointers and the Pole, round the Little Bear, then back toward Hercules, the head of the Dragon, with α, the bright eyes, β and γ, being rather low down, and somewhat north of northeast.



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.

Hints to Draughtsmen.

Draughtsmen, as well as others, have their little kinks, and the publishing of these kinks often helps others. A practical draughtsman in *Wood and Iron* gives the following simple suggestions, which will likely prove useful to some reader. In mixing up inks, the process is very much expedited by heating the dish and water in which it is mixed before commencing. It often happens in the summer that the flies walk over a tracing and eat off the ink in a very provoking manner. The use of vinegar instead of water will prevent this. In making a tracing, the cloth will take the ink much better if it is rubbed over with chalk. Tracing cloth that has been rolled up may be straightened out effectually and expeditiously by drawing it over the edge of a table or drawing board, holding it down meantime with an ordinary three-cornered scale. When there are a large number of drawings made and kept, a great deal of trouble and confusion can be avoided by making all the drawings on extra standard sizes. If a size of 16 × 24 in. be adopted, then the next larger size would be equal to two of these, or 24 × 32 in. This enlarging or reducing process may be carried as far as the circumstances require, but it is always best to do it by the doubling or halving process if possible.

One of the advantages of standard sizes of drawings is that they may be kept in a case of drawers, the size of which is made to accommodate the standard sizes determined upon.