

NIGHT SKY—SEPTEMBER AND OCTOBER.*

BY RICHARD A. PROCTOR.

Low down between north and northwest we find the seven stars of the Dipper, the Pointers on the right nearly due north. They direct us to the Pole Star. The Guardians of the Pole, β and γ of the Little Bear (*Ursa Minor*), lie in a direction from the Pole Star corresponding to that of the minute hand of a clock about 17 minutes before an hour. Between the Pointers and the Pole Star we find the tip of the Dragon's tail, and sweep round the Little Bear with the Dragon's long train of third magnitude stars, till we come, after a bend, to the Dragon's head, with the two bright eyes, α and β (part of the Dragon's nose has been borrowed by Hercules). These two stars are almost exactly midway between the horizon and the point overhead, and nearly northwest. King Cepheus—not a very conspicuous constellation—lies between the point overhead and the Little Bear.

Low down in the northwest we find the head of the Herdsman (*Bootes*). The Crown (*Corona Borealis*), which no one can mistake, lies on his left, and close by is the setting head of the Serpent. Above these three groups we see Hercules—the Kneeler—his head at α , his upraised club by γ . Above the head of Hercules we find the Lyre, with the bright star Vega; and above that the Swan.

Passing southward, we see the Serpent Holder (*Serpentarius* or *Ophiuchus*), beyond whom lies the Serpent's tail, a most inconvenient arrangement, as the Serpent is divided into two parts. Almost exactly southeast, and low down, are the stars of the Archer (*Sagittarius*); while above, in the mid-sky, we see the Eagle (*Aquila*), with the bright Altair. Note the neat little constellation, the Dolphin (*Delphinus*), close by.

Due south is the Crane (*Grus*); above it the Southern Fish, with the bright star Fomalhaut. Above that the Sea Goat (*Capricornus*), and on the left of this the Water Bearer (*Aquarius*); one can recognize his water pitcher, marked by the stars β , γ , and α .

Toward the west, high up, is the Winged Horse (*Pegasus*); he is upside down just now. Below lies the Whale (*Cetus*), or rather the Sea Monster. I have my own notion about Cetus, regarding him as an ichthyosaur (but that is neither here nor there). The star α of this constellation is called Mira; it is a wonderful variable star. The Fishes (*Pisces*) may be seen between the Whale and Pegasus. Few constellations have suffered more than Pisces by the breaking up of star groups. The fishes themselves are now lost in Andromeda and Pegasus.

Note how on the left of Pisces the Ram (*Aries*) "bears aloft" Andromeda, the Chained Lady (whose head lies at α), as Milton set Aries doing long since. The Triangle serves only as a saddle. Between Andromeda and her father, Cepheus, we find her mother, Cassiopeia, or rather Cassiopeia's Chair. (Of course β , γ , and α mark the chair's back.) Perseus, the Rescuer, lies below; β is the famous variable *Algol*. Below him lies the Bull (*Taurus*), with the Pleiades and the bright Aldebaran. Low down, to the left of the Bull, we find the Charioteer (*Auriga*), with the bright Capella. And lastly, any one who likes may admire the Camelopard (*Camelopardalis*), between the Great Bear, Cepheus, and the Charioteer.

WILLIAMS & ORTON MFG. CO., Sterling, Ill., write, on the 18th of September, in remitting the payment of a bill for advertisement in SCIENTIFIC AMERICAN:

"Can't keep up with orders for gas engines. Inquiries from SCIENTIFIC AMERICAN inundate us."

This sounds well for the demand for gas engines, and also for the SCIENTIFIC AMERICAN as an advertising medium.

* For details about the various constellations, the reader is referred to the author's "Easy Star Lessons," published by Putnam's Sons.

Heat of Combustion.

The quantities of heat generated by the combustion in oxygen of one gramme of hydrogen and of carbon are stated to be as follows, the unit employed being the quantity of heat which is required to raise the temperature of one gramme of water from 0 deg. to 1 deg. Centigrade: Hydrogen, 33,881, according to Andrews, and 33,462, according to Favre and Silbermann. Carbon—product CO_2 —wood charcoal, 7,900 Andrews, 8,080 Favre and Silbermann. The percentage composition of a fuel having been ascertained by analysis, its calorific power can, therefore, be determined by calculation. Thus, in the case of a fuel consisting only of carbon and hydrogen, if we multiply the amount of carbon and the amount of hydrogen by the respective numbers expressing the calorific power of carbon and of hydrogen, and add the products, the sum represents the relative calorific power of the fuel. When oxygen is present in the fuel, a deduction has to be made; and if we assume that it is the hydrogen which is rendered ineffective by combination with the oxygen, then, as in water, the oxygen is combined with one-eighth of its weight of hydrogen, we have to deduct from the hydrogen of the fuel one-eighth of its weight of oxygen.

To Clean Woolen Fabrics.

The *Leipziger Muster-Zeitung für Faerberei*, which is likely to be good authority on such subjects, expresses its views on cleaning woollens as follows:

Opinions on the best methods of cleaning woollens are so infinitely different, and so various and contradictory are the statements of practical papers on this point, that it appears to me, says the editor, a remunerative and interesting task to examine the matter thoroughly. I tried the various degrees of heat, from the hottest to the coolest temperature, and I employed all the favorite cleaning materials one after the other—soap, borax, ammonia, benzine, and mixtures of these articles. The results were so decided, and so plainly marked, that the following conclusions must be regarded as definitely established:

1. The liquid used for washing must be as hot as possible.

2. For the removal of greasy dirt, sweat, etc., borax is of so little value that its application would be mere waste. Soap lye alone is better, but the preference must be given to soap lye along with ammonia. This mixture works wonders by quickly dissolving dirt from particular parts of underclothing which are hard to

cleanse. It raises and revives even bright colors, and is altogether excellent.

3. On the other hand, for cleaning white woolen goods there is nothing which even approaches borax. Soap lye and borax, applied boiling hot, gives white woollens a looseness and a dazzling whiteness which they often do not possess when new.

4. If shrinking is to be entirely avoided, the drying must be accelerated by repeatedly pressing the woollens between soft cloths. In no case should woollens be let dry in the sun, as in this case they become dry and hard. They are best dried in a moderate current of air, and in cold weather in a warm place, not too near the stove.

For colored goods there should be prepared a lye of seven quarts of soft water and two ounces of the best soft soap, the quantities being, of course, modified according to judgment and the dirtiness of the articles. The soap is dissolved over the fire, and the lye, properly stirred up, is divided into two vessels, to one of which is added a teaspoonful of ammonia for each quart of lye. The woollens must be entered at a heat which the hand cannot bear, and the fabric must consequently be turned and pressed with smooth wooden stirrers. They are then pressed out as far as possible, and transferred to the

second lye, containing no ammonia, and which by this time has become so cool that the articles can be pressed by hand, but no twisting or wringing must take place. They are then pressed between three or four soft dry towels, till the latter no longer become wet.

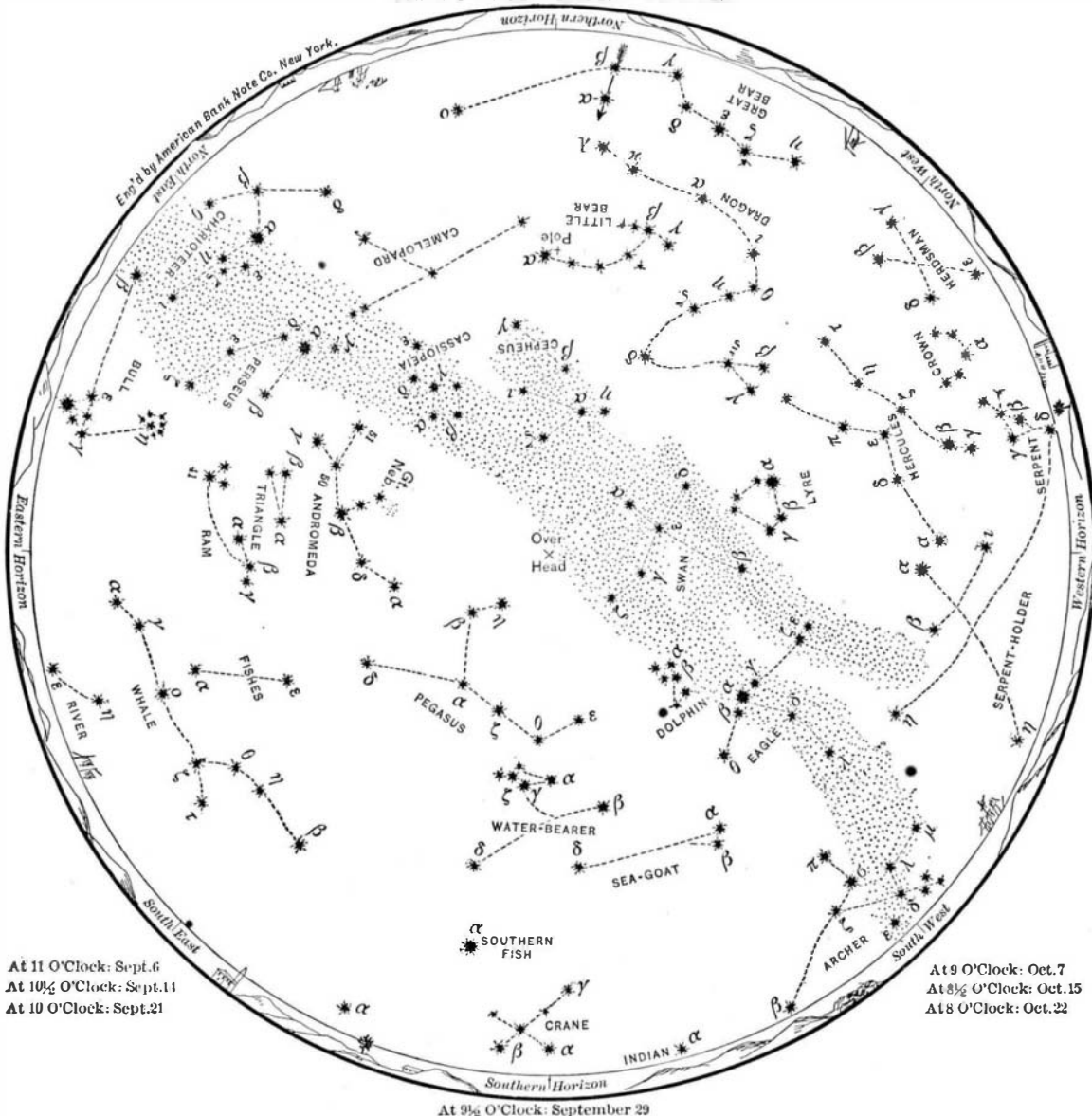
For white woollens there is added, instead of ammonia, a teaspoonful of powdered borax to each quart of soap lye, and the operation is otherwise conducted exactly as above described. If the second lye is too soapy, it may be diluted with a little hot water.

After two or three lots of woollens have thus been washed, the lye must be heated again—the first lot being put aside to settle, the second being made first—with the addition of ammonia or borax, as the case may be, and fresh lye made for the second.

International Exhibition in Spain.

An international exhibition, under the auspices of the Spanish government, will be held at Barcelona, from September, 1887, until April, 1888. The exhibition will include all things connected with agriculture, industry, commerce, navigation, electricity, and education. In order to encourage the display of novelties, the government will guarantee the protection of Spain to the exhibitors of inventions capable of being patented, and of drawings, models, and trade marks.

NIGHT SKY: SEPTEMBER & OCTOBER



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.

Calculated on the basis of the figures of Favre and Silbermann already given, the evaporation unit for hydrogen is 62,658, and for carbon 14,691.

The Ruby-throated Hummingbird.

(TROCHILUS COLUBRIS.)

This, the smallest of our northern feathered beauties, is about three and a half inches long. His plumage is golden green above, golden red about the throat, purple brown on the wings and tail, and white beneath. All these hues have a brilliant metallic luster, which changes with every movement. Although he is small, he is very brave, and has no fear of any larger bird. He has even been known to alight on the head of an eagle and pull the white feathers out in mouthfuls, while the royal bird goes screaming through the air in unsuccessful attempts to get rid of his small tormentor. The nest is very small, being about an inch and a half in diameter. It is usually placed on the top of a bough, and rarely at the sides of the trunk. The outside is so nicely covered with lichens and bark that it resembles very closely a knob of the tree. The inside is composed of vegetable down, such as that of the downy thistle. The nesting place varies; sometimes an old apple tree is selected as a place of residence, and then again a low shrub in some garden. The eggs, two in number, are pearly white.—*Nat. Companion*.