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through interstellar space at a rate which throws the "winged lightning" altogether into the shade. But the theory that their tails are part of the solid substance which has been vaporized by the heat generated from rapid motion is "not proven" at present, any more than is the rival doctrine which ascribes the tail to the fact that proximity to the sun causes the body to dissolve. Dr. Tyndall's ingenious theory is to the effect that the cometary appendage is a sort of illuminated cloud, formed by the effect of the sun's rays passing through the head of the comet. In that case the tail would be scarcely more than an optical illusion, and a collision with it would be not much more dangerous than collision with a moonbeam. But even granted that there is little solidity about the monster's "tail" or "head," there is still the bright, round nucleus or head of the comet to be taken into consideration. Some astronomers assert that the head can hardly be thicker than the tail, and stars have been seen through it, while a transparent body, unless it be like glass, cannot be gifted with much solidity. But it seems doubtful whether there is sufficient evidence for the cometary nucleus being so thin as to be really transparent. A more valid argument against a comet possessing much density is that no planet has ever been known to be in the slightest degree affected by the neighbourhood of one of these rovers of the firmament. They are themselves readily diverted out of their course, but have no apparent power to attract other heavenly bodies. Lexell's comet was making post-haste for the sun, when it came rather too near Jupiter, and that gigantic planet exercised such an influence that the creature was at once shunted off into space, and has never been heard of since. Hence there seems considerable ground for believing that comets are worse to look at than they would prove in an actual collision. The chances are that even the nucleus of a comet would not destroy all living creatures on the earth, if we were unfortunate enough to pass through it or bump up against it. Hence, supposing the coming comet to fall into the sun in the course of a year or so, there is some reason for hoping that the consequences would be rather interesting than disastrous. Probably the nucleus is no more than a fine mist; but suppose it is a good deal more? To predicate solidity of a body of the immense size of a comet is appalling. Were it in that case to be precipitated into the sun the increase of heat produced might be absolutely fatal to all organic life on our planet. We might suffer from torrid tropical weather in December, and our July and August would be absolutely intolerable even to a salamander. The vast icebergs of the Polar Seas would suddenly melt, and the whole world would be infallibly flooded, and human beings, if not previously scorched to death, would be drowned. The mere flare up at the moment when the comet was swallowed in the solar furnace might be so enormous as to shrivel our little planet into a red-hot circular cinder.

THE CLIMATE OF RHODE ISLAND.

J. A. P., of Cincinnati, asks whether it is true that the climate of Rhode Island is becoming milder and whether or not Narraganset Bay was ever so frozen over that wood could be brought on the ice from old Fort Adams to Newport. The answer to the last question will explain the reason for the moist temperate climate of Rhode Island. That there has been much change of climate, I do not believe, although the denuding of any country results in hotter summers and colder winters. But an exceptional cold snap in any year does not prove anything. Very cold winters usually follow very mild ones, and the freezing over of the

Bay in question one winter would simply show that there had been an unusually high range of temperatures previously. It is not impossible for the Narraganset Bay to have been frozen over, no more wonderful an occurrence than the freezing over of the Sea of Marmora in 401, or of the Hellespont in 702.

A HIGHER EVOLUTION.

Dr. C. C. Bennet asks the following question:

"It has been said that at the beginning of the carboniferous era no air-breathing animal could exist, that the immense coal-forming ferns, absorbing the carbonic acid gas so defiled the atmosphere that first amphibious, and then by degrees, more perfectly developed land animals, up to man, came into existence. The question now is, in your opinion, does that exhalation still go on, (equivalent), promising therewith a higher evolution of life?"

This is entirely too deep for us. It is a question that should be referred to Mr. Tyndall. As far as we know the atmosphere was perfectly adapted to our use although we would think this was not the general opinion in this country from the care usually taken to prevent its penetrating into houses in summer as well as winter and the waste of their stifling gas emitting coal stove.

Fortunately man is so constituted that he can become used to everything, so that the city alderman, who has never been into the country, actually revives the delightful odor of reeking chimneys and the occasional whiffs of sewer gas, which the convenient air holes at the edge of the sidewalk, provide for the wayfarer.

As men know more they will not be satisfied until in city and country they obtain the full benefit of the pure breath of heaven.

THE VAPOR SUPPLY.

Mr. Theodore A. Kingsley asks where the vapour supply for the North Temperate Zone comes from? This question perhaps may best be answered by the application of several well known general rules which may be summarized as follows: Winds traversing a considerable extent of ocean carry with them a moderate rainfall; if they advance into colder regions, the vapor is more rapidly precipitated and the rainfall is increased; if they are intercepted by a range of mountains, the rainfall on the windward side is thereby increased and that on the leeward side diminished; if but a small extent of water has been traversed by the wind, the rainfall is not large; if the breeze passes into a warmer climate the rainfall is lessened or reduced to nothing.

The application of these rules will explain the peculiarly moist climate of the west of Ireland to which the rain is carried from the breeze from the south east over the Atlantic and the dryness of California, where the prevailing breeze comes from the cold and dry slopes of Alaska. These illustrations are very extreme ones, but the principle applies equally well to any section of country. The prevailing winds and the extent of water they traverse rule the rainfall.

Editor Bulletin.

Sometime ago you said in one of your BULLETINS that you wanted each subscriber to ask one question. What is Zodiacal Light? By answering the above you will greatly oblige, Yours truly,

HENRY H. EMERSON.

REPLY.—Zodiacal Light is the faint nebulous aurora which accompanies the sun, and is visible immediately before sunrise, is after sunset in the place the sun is about to be visible, is in the one it has just vacated. It is best observed about the beginning of March or towards the vernal equinox, when the pyramids of Zodiacal Light is directed to a point nearer

the zenith than at any other season of the year. On its discovery it was supposed to be the atmosphere of the sun, and now, while this theory is no longer held, astronomers have not been able to decide what the cause of it really is.

Preparing Skeleton Leaves.

A correspondent of *Knowledge* gives these directions for preparing skeleton leaves: Take a large saucepan of cold water, and a piece of scrubbing soap about four inches square, cut into small slices. Gather mature leaves, seed-vessels, etc.; put some soap into the water, then a layer of leaves one by one, then more soap, then leaves and so on. Put on a lid, set the pan by the side of a fire, and let it simmer. After an hour take out a few leaves, and try them between the thumb and finger; if the pulp separates readily from the fibre, remove them from the fire; if not, let the pan remain. Some leaves, such as ivy, orange, etc., are done in an hour or two; others of a tougher fibre take half a day. Seed vessels of mallow or campanula take a short time. Large poppy or stramonium requires perhaps two days. Now lay a leaf upon a plate, under a tap of running water, and beat it with sharp strokes with a hard brush—say a tooth brush; the green matter will run off with the water. When the skeleton is quite clean, dry it upon blotting paper.

To bleach the specimens put a quarter of a pound of chloride of lime into a large bottle of water, cork it, and let it stand some days. Strain it, and mix with more water in a basin; immerse the leaves, etc. Again carefully watch and remove them as soon as they are white, for the lime soon renders them brittle and rotten. Wash again in pure water, and dry as before. As the stem usually comes away from most leaves, it is well to boil several stalks separately, and after bleaching to mount the leaves by gumming them to the stems.

The Forests of Louisiana.

Louisiana, according to the *New Orleans Democrat*, possesses a rich variety of timber. The pine is the most abundant tree in the State, and constitutes over a third of the lumber wood of Louisiana. The cypress is unexcelled for shingles. Walnut and gum are well adapted to cabinet making. The first is master of the furniture field, while the gum has a brilliant future before it, and promises to be its successor at an early day. The cottonwood has been found equal to the famous white pine of Michigan for boxes, and even stronger and more durable. The live oak is admitted the best timber for shipbuilding in the world. Growing in the swamps, it becomes completely impervious to water, and will resist water-rotting longer than any other wood known. The white oak has been found unexcelled for staves for the tougher barrels and casks. In shipping this timber to Europe, New Orleans does a large business. The ash and smaller oaks are unexcelled for fuel; they are firm and hard, and give a long lasting and hot fire. Excellent charcoal is furnished by the pine. These varieties of woods are to be found in nearly every portion of the State, and cover nineteen-twentieths of the forest area of Louisiana. It is estimated, says the *Democrat* that the State of Louisiana contains about 80,000,000,000 feet of good lumber, more than twice as much as Michigan; 300,000,000 cords of wood fuel, worth, when sawed, some fifteen times the assessed value of the State, some \$20,000,000.

True bravery is shown by performing without witness what one might be capable of doing before the world.—[*Rockefoucauld*.