

## Notes.

M. DUMAS recommends water saturated with alum for extinguishing fires, its value being supposed to be due to the objects wet with it, which prevents contact with the oxygen of the air, and thus diminishes the rapidity of the combustion. The Minister of the Interior has recommended that the firemen of the French towns be supplied with facilities to use such solutions of alum.

FOR CONVERTING A PHOTOGRAPHIC NEGATIVE INTO A POSITIVE, Capt. Bing coats the back of the negative with soluble bitumen or asphaltum, and exposes it to light through the negative. The parts through which the light penetrates become insoluble, and the remainder of the asphaltum is dissolved off with any of the usual solvents, leaving a positive. The silver negative is thereupon dissolved off with chloride of copper and a fixing agent, such as cyanide or hypo.

THE COLOUR OF WATER.—Experiments made by J. Aitken confirm the usual notion that pure water has a blue tint; but he finds that the theory of selective reflection is insufficient to account for all the variations as to tint met with in the case of natural accumulations of water. Whitish particles are suspended in the water of the Mediterranean, and the tint varies from deep blue to chalky blue-green, according to the proportion in which these particles may be present.

ELECTRICAL PHENOMENA IN PLANTS.—M. Kunkelo has found that the veins of the leaf are generally electrified positively with respect to the remainder. When a plant is broken or bent, the electrode, if placed in the neighbourhood of the break or bent is negative. Dr. Sanderson has pointed out analogous phenomena in the leaf of the *Dionée* fly-trap; the lower surface of the sensitive lobe of the leaf is electro-negative with respect to the upper surface, at the instant the leaf is irritated; at the end of half a second, the upper surface becomes in turn electro-negative and remains so for some time.

LIQUEFACTION OF OZONE.—A few years ago, Pictet, of Geneva, succeeded in liquefying several gases which thus far had been considered to be beyond the possibility of being liquefied; it was principally oxygen and hydrogen to which his attention was directed; now the report comes that Hauteville has succeeded in liquefying that peculiar allotropic form of oxygen called ozone, to a liquid of a beautiful blue color. The agent of course, is also pressure and cold. The pressure being some 125 atmospheres or 1800 lbs. to the square inch in connection with an artificial cold of many degrees below zero, Fahrenheit.

AURORA BOREALIS (Northern Lights).—According to Nordenskjöld the aurora borealis is a permanent natural phenomenon in the polar regions. It appears every night and always in the same parts of the sky. The centre of the aurora is a little to the north of the magnetic pole in a plane perpendicular to the polar axis. This would be something like one of Saturn's rings, but of a very different composition and with frequent changes of brilliancy and form.

The Abbé Moigno, however, considers the above hypothesis to be improbable.

At the meeting of the Paris Academy on Monday, M. Dumas stated that at the very beginning of its work, the Academical Commission for the destruction of the Phylloxera proposed to arrange for the immediate destruction by fire of each plant proved to be infested. Objections were made to this scheme grounded on the state of French legislation on rural property, and the Academical Commission desisted. M. Dumas states that he has in hand an official report from Switzerland establishing the soundness of the views taken by the Academy on this important question. The cantons of Geneva, Vaul, and Lucerne having resorted to the destroying process, all the vines, of which the value exceeds £40,000,000, had been saved at the expense of a few thousand pounds. A special tax had been imposed on the proprietors of vines for compensation to the owners of the destroyed plants.

THE RANGE OF SOUNDS IN AIR.—M. Allard in his investigations as to the range of sounds in air observes that in seeking to establish for sonorous ranges, a formula analogous to that which gives the ranges of light, it is necessary to assume that the intensity of the sound is proportional to the work expended in producing it. From a large number of experiments M. Allard deduces that the intensity of the sound in the air decreases more rapidly than as the square of the distance.

He considers that a second cause of enfeeblement of the sound lies in the action of the air itself which, when it is non-homogeneous, reflects and disperses a part of the vibratory movements of the wave.

Besides, these experiments have demonstrated that a given sound, apart from the influence of the wind, may have very different ranges, varying, e.g., from 2 to 20 nautical miles; differences which may be explained by supposing the coefficient of acoustic transparency to be variable within certain limits. Finally, the work required rapidly increases for small augmentations of range, and the differences of range for different pitches within the octave, are very slightly sensible.

NEW ANTISEPTICS.—At the last Annual meeting of the British Medical Association, M. Mayo Robson described a series of experiments made by him to verify the efficacy of atmospheres charged with volatile antiseptics to prevent the development of life in putrescible liquids. The results are very favourable. Bottles containing an infusion of dead grass, suspended in open large-necked jars, in which a little of the oil of the *Eucalyptus* had been poured, remained perfectly limpid, while phials of the same infusion exposed in the open air and even protected by cotton cloth become thick and covered with mould in a few hours. These vapours in fact are fatal to the germs of bacteria, and probably also to the germs of fevers and infectious diseases. As these vapours are not hurtful to respiration, it is to be hoped that hospital experience will confirm the anticipations of M. Robson. *Eucalyptus* oil is abundant and cheap. Many surgeons have employed it in their operations, the method of application being as follows:

Air is first received in a vessel filled with cotton, then in others filled with pumice-stone saturated with *Eucalyptus* oil. The air is thus deprived of all germs, and is blown upon the wound.

DR. KING, the Superintendent of the Royal Botanic Gardens, Calcutta, has recently issued his report for the year 1881-82. The Calcutta Garden may be said to be the centre of botanical work in India, and none can probably claim a greater antiquity, as the report before us is stated to be the ninety-fifth annual report of these Gardens. Like its predecessors the report opens with a description of the changes and improvements in the Garden itself, points which are, of course, only of local interest. On the subject of india-rubber yielding plants—a subject of very great importance—Dr. King says: "Clara rubber (*Manihot Glaziovii*) continues to grow well here; our trees are beginning to seed, and from their produce I was able to distribute during the year a good many seedlings to tea-planters in Assam, Chittagong, and elsewhere. A species of *Landolphia*, which is one of the sources of the rubber collected in Eastern Africa, has (thanks to the exertions of Sir John Kirk, Her Majesty's Consul-General at Zanzibar) been introduced in the Garden. From the seeds sent by Sir John Kirk a number of young plants have been raised, and these at present look very healthy. The cultivation of the plant yielding Para rubber (*Hevea Brasiliensis*) has been abandoned, as the Bengal climate proves quite unsuitable for it. Of *Castilloa*, another South American rubber-yielder, we have as yet only eight plants, but it is being propagated as fast as possible." Another important subject is that of the production of materials for paper-making, and of these plantain fibre seems to have occupied some attention. It seems that during the dry months, simple exposure of the sliced stems to the sun is a sufficient preparation for the paper-maker, provided the paper-mill be on the spot. What is still wanted is some cheap mode of removing the useless cellular tissue, so that the fibre may be shipped to England without the risk of fermentation during the voyage. The cultivation of the plantain for its fruit is so universal over the warmer and damper parts of India, and its growth is so rapid, that the conversion into a marketable commodity of the stems at present thrown away as useless would be an appreciable addition to the wealth of the country. The paper mulberry of China and Japan (*Broussonetia papyrifera*) is being tried in the Garden, as well as in the Cinchona plantations in Sikkim, as it is well known that the bark yields a splendid paper material. A plant which appears to be at present unknown, but which Dr. King thinks will prove a species of *Eriophorum*, is also favourably reported upon. Under the head of "Other Economic Plants," mahogany, the rain-tree, and the Divi Divi, are said to be in considerable demand. A large interchange of seeds and plants has been effected during the year, with other parts of India, as well as with England and the Colonies.