SCIENTIFIC NEWS.

A puzzle for horticulturists has been forwarded by the French Bishop of Canton to the *Jardins d'Acclimatation* in Paris, in the shape of a plant which changes color three times a day. There is nothing remarkable in the hues of this vegetable chameleon, but the regularity with which the changes take place is extremely curious.

The *Société d'Encouragement* has offered the following prizes for chemical discoveries:—Best commercial process for the preparation of oxygen gas, 2000 fr., 1874. Artificial preparation of the fatty acids or of matters allied to wax, 4000 fr., 1874. Disinfection of gas residues, 3000 fr., 1874. Disinfection and prompt clarification of sewage, 1000 fr., 1875. Ink not attacking metallic pens, 1000 fr., 1875. Economical production and application of ozone, 3000 fr., 1875. Fixation of atmospheric nitrogen, either as nitric acid, ammonia, or cyanogen, 2000 fr., 1876. Artificial production of graphite, suitable for lead pencils, 3000 fr., 1877. Artificial preparation of a compact black diamond, 3000 fr., 1877. Industrial application of oxygenated water, 2000 fr., 1878.

A remarkable paper has recently been contributed to a German magazine, by Prof. Mohr, showing not only that the sap does not freeze in trees and plants which live through hard winters, but also the reason why it does not freeze. He says that though it is true water, as we generally see and understand it, freezes at thirty-two degrees, it does not do so when its particles are finely divided. Tropical plants have large cells, and these are the ones in which the sap freezes; but in plants with very small cells in which the liquid particles are finely divided, there is no freezing of the liquids until after the structure has received injury of some sort. This is true, he says, of insects and insect pupæ. They never freeze; but cut one apart, soon after the humors solidify, and on thawing life revives.

The French are determined to do their best in the now rapidly approaching Transit of Venus. They will have stations at Yokohama, Amsterdam Island, St. Paul in the Indian Ocean, Chee-foo, Pekin, Noumea, Shanghai, Tahiti, the Macdonald Islands, and the Marquesas. Photographing will form a principal feature of the expeditions, and in order to insure as far as possible the success of this branch, a small observatory has been erected at the Luxembourg for the purpose of experimenting and agreeing upon the best process of manipulation in order to obtain photographs of the requisite delicacy.

In the *Bulletin* of the Chemical Society of Paris, there is a description of a curious process for obtaining colouring matter from organic bodies. Any vegetable matter—such as sawdust, bran, humus, tannin, aloes, &c.—is acted on by sulphur and caustic soda in a furnace. Sulphuretted hydrogen is liberated in large quantities, and the vegetable substance, whatever it may be, is rendered soluble in water, to which it imparts a strong colour, varying with the substance employed. These solutions are employed as dyes, which are fixed by passing the fabric through boiling bichromate of potash.

The following information will be of interest and importance to the possessors of fir trees, of which there are many in Scotland. In the juice of fir trees, between the wood and the bark, there is a crystalline substance called coniferin. This is what chemists call a glucoside—that is, a substance which readily breaks up into grape sugar, and some other variable substance. When this coniferin is acted upon by oxidizing agencies, it is easily converted to vanillin, or the chemical principle of vanilla. A few grains of this chemical principle is sufficient to flavour at least a dozen ice puddings. The juice of an ordinary sized fir tree contains enough coniferin to make five guineas worth of vanillin. This last triumph of chemistry is the result of researches made in Dr. Hoffman's laboratory at Berlin, and communicated in a letter which has been placed at our disposal by a gentleman who was formerly professor of chemistry in Edinburgh.

In answer to numerous inquiries, Mr. S. P. Sharples, Massachusetts State assayer, has given in the *Boston Journal of Chemistry* a brief description of the process of nickel plating. The patent is still before the courts, and no decision has been reached in regard to it. The double sulphate of nickel and ammonium, which is the salt that is generally used, may now be had in commerce almost pure. It is manufactured on a large scale by Mr. Joseph Wharton, of Camden, N.J., who controls the American nickel market. Cast nickel plates for anodes may be obtained from the same source, the anodes should considerably exceed in size the articles to be covered with nickel. Any common form of battery may be used. Three Daniell's or Smee's cells, or two Bunsen's, connected for intensity, will be found to be sufficient. The battery power must not be too strong, or the deposited nickel will be black. A strong solution of the sulphate is made and placed in any suitable vessel; a glazed stoneware pot answers very well if the articles to be covered are small. Across the top of this are placed two heavy copper wires, to one of which the articles to be covered are suspended, to the other the anode. The wire leading from the zinc of the battery must then be connected with the wire from which the articles are suspended, the other battery wire being connected with the anode. In order to prepare the articles for coating, they must be well cleaned by first scrubbing them with caustic soda or potash, to remove any grease, and then dipping them for an instant in *aqua regia* and afterwards washing thoroughly with water, taking care that the hand does not come in contact with any part of them. This is accomplished by fastening a flexible copper wire around them, and handling them by means of it. The wire serves afterwards to suspend them in the bath. If the articles are made of iron or steel, they must be first covered with a thin coat of copper. This is best done by the cyanide bath, which is prepared by dissolving precipitated oxide of copper in cyanide of potassium. A copper plate is used as an anode. After they are removed from the copper bath, they must be washed quickly with water and placed in the nickel bath; if allowed to dry or become tarnished, the nickel will not adhere. Great care must be used through the whole process to keep all grease, dust, or other dirt from the articles to be covered, or else the result will be unsatisfactory. The whole process is one of the most difficult that is used in the arts, it being far easier to gild, silver, or copper an article than to nickel it; but if due care be taken the results will amply pay for the trouble.

Another Balloon Expedition.—The failure of all North Pole expeditions to discover the secret of the Arctic regions has stimulated the Aeronautic Society of Paris to attempt an Arctic balloon voyage. Extravagant as the notion may appear, it is not more extravagant than Prof. Wise's project of crossing the Atlantic Ocean in a balloon. One advantage of an aerial North Pole voyage is the temperature of the Arctic regions, which prevents the escape of gas from the balloon to such a degree that it is supposed to be quite feasible to construct a balloon which will last a three month's voyage. Another advantage is the absence of darkness in the Northern regions. If the balloon leaves in the summer time, the sun will illumine the heavens during the whole trip. Then, again, the permanency in the direction of the winds around the regions of the North Pole would be another point in favour of the trip to the North Pole over that across the Atlantic. The size of the proposed balloon is fixed at about 18,000 cubic metres. It is calculated to carry ten men, three months' provisions, apart from the ballast, a number of instruments, an anchor, and a dragging rope, which will touch the ground should the balloon sink too near to the earth. An ingenious arrangement has also been made to prevent the balloon from rising higher than 800 metres, or about 2,500 feet. The boat of the balloon is to be lined with sheepskins and heated with lamps, so that even if the temperature should fall to 32 deg. below zero outside, it will be 5 deg. above zero inside. A vessel is to carry the men, the balloon, and the ingredients for the manufacture of the necessary amount of gas to about seventeenth degree of latitude. This will have a trip of about 300 miles to the North Pole for the balloon to accomplish, and the voyage there and back could be made within twenty days. Everything, however, is to be prepared for a full three months' trip. The enterprise is exciting unusual interest amongst the scientific men of Europe, and is, indeed, one of the most wonderful schemes ever conceived by the human mind.

A large number of sewing machines are sent from Canada to South America. One house proposes to send an Agent to Lima.