SCIENTIFIC MISCELLANY.

A shark's tooth has been found in a submarine cable at a depth of 350 fathoms. Five varieties of shark are known to go as deep as 300 fathoms, and one reaches 500 fathoms.

Vaccination of plants is the idea of a French botanist. Parasitic diseases —microbial or fungoid—harm through the poison they cause the tissues to absorb, and inoculation with suitable cultures makes the tissues proof against absorption.

Of the many substitutes for olive oil, the favorite is cotton-seed oil, but German experiments are reported to have shown a formidable rival in sunflower-seed oil. This cheap material promises to become quite important. It is adapted for many uses, and seems to be especially desirable as a lamp oil, for dyeing purposes and for soap making.

As a result of bad roads and heavy transportation, army horses in Argentina have been overworked during the rainy season, and many of them have been exhausted or fallen ready victims to disease. To give greater endurance, sugar has been added to the food of the animals. The effects have been quite surprising, and it is reported that not only has fatigue been overcome by two ounces of sugar in the daily food, but that animals that had become quite useless regained strength and capacity for work.

Stonehenge, the mysterious monument of Salisbury Plain, seems to have been originally a circular roofed temple, with thirty huge upright stones in its outer wall and an inner horse shoe structure of ten even larger stones. The outer diameter was about 100 feet, the whole being surrounded by a circular earthen bank about 300 feet in diameter. An avenue runs from the center to a single stone about 250 feet towards the northeast, and Sir Norman Lockyer and Mr. F. C. Penrose suppose this to have originally pointed to sunrise on the year's longest day. From the changes in the point of sunrise, they fix Stonehenge's date at 1680, B. C., with a possible error of 200 years. Polished flints found in the late raising of one of the monoliths indicate that the stones were trimmed before bronze implements appeared, and that the work must have been done before 1500, B. C.

A new field has been opened to florists by late experiments. Plants are made to blossom out of season by giving them a period of rest, like that of winter, and the usual method is to expose them to frost, causing the leaves to fall, after which they grow as in spring. The plan is inconvenient and somewhat uncertain. In 1895 Prof. Johannsen showed that exposure to ether vapors has the same effect as cold, and Prof. Albert Maximene has now brought forward proof that the process is practicable. The plants are placed for fifty hours in a tight box containing ether vapor, the soil under them being kept dry. The leaves fall and the flow of sap is arrested, when warmth and moisture cause a rapid development of new leaves and blossoms as in spring. Full blown lilacs have been shown in September, a month after etherizing. The process is most effective from July to September, and it is at present adapted only to plants that flower in spring on the previous year's wood and form buds as early as July. These include such shrubs as the azalea, spirea, snowball, etc.

The origin of pearls has been a subject of much speculation. About 150 years ago Filippi of Turin announced that a living organism forms the nucleus; and in a recent investigation M. Raphael Dubois, a French naturalist, has shown that all pearls found in a common pearl-bearing mollusk are cysts enclosing distomes, small marine worms. In the month of August, when few pearls are obtained, the tiny young distomes, a fiftieth of an inch in diameter, are to be seen instead as reddish yellow points. These become gradually coated with carbonate of lime, in an early stage appearing as black specks, and later as brilliant pearls, which remain until the following summer, when they drop to pieces and the parasite resumes activity and reproduces its kind. But if the parasite dies the crust continues to grow, a large and beautiful pearl, being but the sarcophagus of a long-dead worm. Just how nearly universal this cause of the formation of pearls may be does not appear, but experiments with fresh water pearls show an egg as nucleus.

Cheap oxygen will effect enormous saving in fuel, especially in metallurgical operations, and will doubtless revolutionize some industries. The separation apparatus of M. Raoul Pictet, the Geneva physicist, is in the form of ten pan-like stills, one upon another. A vertical pipe passes through the center of the entire series, and each still holds a supply coil connecting with a supply main at one side of the apparatus and the central pipe, and a discharge coil through which the evaporated gases escape. These coils are long and are so arranged that the evaporating gases abstract heat from the incoming air. At starting, the stills are filled with liquid air, and ordinary air, previously dried by cooling below the freezing point of water, is pumped through the supply coils at a pressure of 30 to 40 pounds per square inch, and liquifies as it reaches the central pipe, keeping up the supply. The liquified air passes to the top of the apparatus, where a filter removes the frozen carbonic acid. It then enters the top still, overflowing into each of the others in turn, and evaporating as it passes downward, the pressure being now that of the atmosphere. The boiling point of nitrogen being 195 degrees C. below zero, 12 degrees lower than that of oxygen, the gas first passing off is nearly pure nitrogen. Even at the fifth still the discharge is 90 per cent nitrogen, but from the three lowest stills it is 55 per cent oxygen, the ordinary product for the market. From the bottom still alone, oxygen of about 90 per cent may be had. It is estimated that a plant treating 500 tons of air per day would yield 110 tons of 50 per cent oxygen at a cost of three cents per 1,000 cubic feet, or 90 per cent oxygen at seven cents, and that the solid carbonic acid would probably pay this cost. About 700 horse-power would be needed to operate such a plant.
