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STRANGE RESULT OF AN ATTEMPT TO PRODUCE NICKEL POWDER ELECTRICALLY

IN attempting to produce nickel powder by rapidly electroplating the metal on a copper sheet, Dr. Oliver P. Watts, professor of electrochemistry at the University of Wisconsin, ran upon a strange phenomenon which he reported to the Detroit meeting of the Electrochemical Society.

A coating of nickel appeared on the back of the copper but none on the front. This, he said, was contrary to all recorded experience with plating solutions. Furthermore, no nickel powder was produced.

Dr. Watts had tried to utilize that "bugbear" of the plater, the "burned" deposit, by passing a very large current of electricity through a dilute solution of nickel sulphate. This should have done the trick, because too heavy a current produces a crumbly deposit which frequently drops off. To increase the conductivity of the solution and thereby increase the current, Dr. Watts had added a large amount of sodium sulphate to the solution and also heated it. Such "conducting salts" are frequently used. To his surprise he got only a film of alkali on the front of the plate, but a good adhering coat of nickel on the back. Measurements showed that three quarters of the current had been employed in depositing the alkali and only a quarter in depositing the nickel. The latter part of the current had to pass around the edges of the plate to reach the back. Usually in electroplating the front of an object is more heavily plated than the back. Other metals and other solutions were tried and it was found that the same thing could be done with cobalt and iron, but not as yet with tin, zinc or copper.

As a possible commercial use of this curious phenomenon, Dr. Watts suggests that the solution might be so regulated as to plate front and back equally, but so far he has been unable to get any happy medium between a thicker coat on the front and none at all there.

REAPPEARANCE OF SCHWASSMANN-WACHMANN COMET

A NEW comet announced by L. Oterma at the Observatory of the University of Turku, Finland, reported to Harvard Observatory through Lundmark, Sweden, is none other than the famous Schwassmann-Wachmann Comet No. 1 which has been under constant observation by American astronomers for the past 15 years.

This is not the first time that this comet has been mistaken for a new one. On August 29, 1941, Dr. G. Neujmin, of the Simeis Observatory in the Crimea, observed it and announced a new comet. But only a few weeks before Professor G. Van Biesbroeck had observed it at the Yerkes Observatory. This time again it was observed only shortly before being mistaken for new, namely, on September 6 at the McDonald Observatory. Dr. Van Biesbroeck has recently calculated its positions for the last four months of this year.

This comet is one of the most remarkable known. Its orbit is nearly circular, lying wholly between the orbits of Jupiter and Saturn about 500,000,000 miles from the sun—five times the distance of the earth from the sun. From time to time, the comet, for some unknown reason, increases in brightness, although never becoming visible to the unaided eye. It was during one of these flare-ups that it was discovered in 1927 by the two German astronomers whose name it bears, and it was at a flare-up on each occasion that it was mistaken for a new one.

Because of its nearly circular orbit, the comet is seldom beyond reach of our powerful telescopes and our photographic plates. It descends at times to the 18th magnitude, at other times brightens, as at present, to the 12th magnitude, 250 times as bright. It shows at present a sharp nucleus surrounded by a nebulous envelope. At other times it appears like a faint star.

AUTUMN COLORS

THE bright leaf colors that everybody admires in the autumn are actually there all summer. They are not usually visible until shorter, cooler days come because they are masked by the stronger green of the more abundant chlorophyll pigment, which crowds them into the background. One of the autumnal changes in the plant is the chemical breakdown of the chlorophyll, which becomes colorless, thus permitting the reds and oranges to shine forth.

Leaf colors are of two distinct classes. The purples and purple-reds are due to a soluble type of pigment that is present in the plant sap. It is the same stuff that makes beets red and some kinds of cabbage purple. The yellows and bright reds are due to pigments of the carotin type, which exist in solid little lumps embedded in the living protoplasm of the cells. They are not as easily soluble as the purple pigment in the sap, and won't come out if you soak the leaves in hot water.

Combinations of the purples, purple-reds, oranges and true reds make all the varied, mottled colors we find in autumn leaves—and in the skins of autumn fruits as well. Leaves of a clear yellow, such as you sometimes find on hard maples, have no purple pigment in the sap. Leaves like those of sumac and sweetgum, of a strong, deep wine-red, are colored by a combination of purple sap-pigment and red carotin in the cells. The changes that may be rung on this color-chime are literally endless.

Even more remarkable than the wonder of leaf coloring, though much less conspicuous, is the provision made by the leaves for their falling off. They do not just snap off and drop, as a dead twig might. That would leave the tree covered with thousands of tiny, open wounds through which bacteria and fungus spores might enter, to cause disease and decay. At the point where the leaf-stem is later to detach itself from the twig, a double layer of specialized, corky cells forms, finally cutting off the sap flow to and from the leaf. When it is complete, the union between the two layers becomes dried out and weak, and finally a little puff of wind finishes the job, letting the dead leaf drift down to earth.

Botanists have given this double layer a special name, "absciss layer." But that is only Latin for cut-off layer, and that is exactly what its function is. The tree or shrub is thus able to bandage its wounds before they actually exist. That is a trick that surgeons and first-aiders would give a good deal to be able to do for humans. —FRANK THONE.

IMMUNE SERUM IN THE TREATMENT OF INFLUENZA

IF an influenza epidemic strikes this winter, the use of immune serum from the blood of the first patients attacked "should be considered" for treatment and prevention and for further studies of influenza prevention, according to a report made by Dr. Joseph Stokes, Jr., of the School of Medicine of the University of Pennsylvania, at the meeting of the Medical Society of the District of Columbia.

Dr. Stokes's cautiously worded advice to his fellow physicians was based on extensive experiments with mice in which relatively small amounts of immune serum protected mice against influenza virus when the protective serum was inhaled by mice. Somewhat larger amounts of the immune serum were required when the serum was injected. In treatment of the mice, the immune serum had to be given within six hours after infection with influenza virus.

Immune serum, from the blood of persons who have just had influenza, contains substances called antibodies which are defensive forces of the body for fighting off the virus. Instead of borrowing these defensive forces from some one who has already had the disease, it is possible to build them up in a person's own blood by vaccination with influenza virus. Dr. Stokes recently reported that such a vaccine protected 43 out of 44 boys who were directly exposed to influenza virus in an experimental study.

The third method of protection against influenza epidemics described by Dr. Stokes consists in sterilizing the air of hospital wards, school rooms, barracks or similar places where large numbers of people congregate. This sterilization may be done by ultraviolet rays or by spraying propylene glycol vapor into the room. The latter seemed to be somewhat more effective than the ultraviolet rays.

Neither of these air sterilization methods, however, can be entirely relied on to stop an influenza pandemic such as swept the world in 1918. The reason, Dr. Stokes explained, is that in pandemics, the travel of the virus through the air may not be the chief manner in which the disease is spread. In pandemics, the disease breaks out suddenly in many widely separated places at the same time. Virus spread through the air is more a factor in epidemics such as those of recent years which traveled across this country in a few weeks.—JANE STAFFORD.

ITEMS

A NEW electronic instrument is being used in flight tests of airplanes which records temperature and pressure changes at the rate of 144 readings every three or four minutes. Developed by the Brown Instrument Company, Philadelphia, this flight recorder replaces three or more men who needed half a minute to write down each reading manually. It was first used on the world's largest plane, the Douglas B19; the recorder automatically printed on paper, during the test flight, the temperatures of all 72 cylinders of the four motors, changing temperatures of the carburetor, exhaust, and of the oil in the fuel lines, and the pressures on wing struts, bulkheads and tail surfaces. In the case of single-seater pursuit ships, the recorder made records that otherwise could not be obtained because test engineers in addition to the pilot could not be carried aloft.

THICK and extra hard coatings of nickel can be formed by adding ammonium salts to the plating bath, and properly proportioning the other ingredients, Dr. W. A. Wesley, assistant director, and E. J. Roehl, research chemist, of the Research Laboratory of the International Nickel Company of Bayonne, N. J., reported to the Detroit meeting of the Electrochemical Society. Many new problems arising in defense activities, the investigators said, involve surfacing of parts to resist wear and corrosion, and the salvaging of worn and mismachined parts, by the electrodeposition of heavy metal layers. The coatings must be hard, have strength, ductility, machinability, adhere strongly, and have a heat expansion close to that of steel. Furthermore, the deposits must not be in layers such as the old "hard baths" gave, but must be homogeneous.

ASTRINGENTS, chemical substances such as are used in so-called "skin tighteners," may enhance the effect of germicides and disinfectants, it was reported before the Denver meeting of the American Pharmaceutical Association. Much used but long in ill repute as antiseptics, the astringents now take their place as an adjunct to other antiseptics. The double action of the two is often desired by physicians but the boost given to germ-killing power of antiseptics by the astringents had not been fully realized. Research evidence presented by Joseph B. Sprowls and Charles F. Poe, of Boulder, Colo., indicates that such chemicals as tannic acid, widely used for burns, has a beneficial effect on the action of several common antiseptics. Development of a single-dose emergency hypodermic unit at the request of the War Department was also reported to the pharmacists by J. D. Hulsmann and F. W. Nitardy, of Brooklyn.

How much water there is in a jelly-fish is the subject of discussion in England even during war time. Dr. A. G. Lowndes, at the Plymouth Biological Laboratory, has determined that jelly-fish in the ocean near Plymouth are composed of about 96 per cent. water, 3 per cent. salts and a trace of fat. The amount of protein, 0.67 per cent., indicates that the animal has only about 4 per cent. protoplasm, the stuff of life. Text-books have long told that jelly-fish contain 99.8 per cent. water, but while they are very liquid, their water content is not as high as that. Most marine animals contain about 80 per cent. water and 15 per cent. protein.