

## SCIENTIFIC MISCELLANY.

A pine and a cypress lately brought from Japan to England are 30 and 40 years old respectively, but are only 6 and 9 inches high. They were artificially dwarfed.

The cooling of the earth is calculated by Mr. R. S. Woodward to be shortening our day not more than half a second in ten million years; falls of meteorites, vastly less.

A durable transparent coating for wood is obtained, according to a German process, by digesting coarsely powdered petroleum asphalt in benzine for one or two days, the well-closed vessel to be in a warm place. A yellowish-brown dye is extracted, which penetrates the wood deeply, protecting it from weather and other destroyers, and which may be washed.

While in South Africa Maj. H. A. Cummings found that the air of the Pretoria valley becomes very hot and dry, and the severe storms generated include whirlwinds carrying dust, paper, leaves, etc. From a gelatine plate exposed one second to a dust storm thousands of colonies of bacteria were developed. It is believed that fevers are spread in this way, and the possible distribution of tropical epidemics is appalling.

A step toward the direct conversion of heat into electricity seems to have been taken in recent German experiments. Accumulators were charged, then heated from 14 degrees C to 45 degrees C (57 degrees to 113 degrees F.), and the result was an increase in their output of 50 per cent. It is evident that the discharge of more current than was received must have been due to change of the heat energy into electrical energy.

The new nebula in Perseus is regarded by Sir Norman Lockyer as confirming his "meteoric theory" of the origin of worlds. Instead of accounting for the observed changes by supposing that a gaseous mass is spreading outward from the central star at the inconceivable velocity of 2,000 miles or more a second, he assumes that the nebula existed before it was seen, and that it is a vast swarm of meteorites, or system of such swarms, of which parts have been made successively visible by collisions with other swarms of fragments. The effect of such collisions would be a flashing into light of the previously invisible masses. The most violent of these collisions brought the "new star" to our notice some months ago, the less violent have produced very faint light, and probably much of the nebula—extending over distances hundreds of times as great as that of the sun from the earth—is still dark.

The heights of appearance and disappearance of eight meteors were measured last August at two French observatories, the highest record being 74 miles and lowest 10 miles.

Certain nervous persons are supposed by F. Larroque to act as receivers for Hertzian waves, which cause them to feel the approach of a storm even under a clear sky. On two occasions last June, instrumental tests proved the presence of such waves while the storm was raging at a distance.

The whitening of hair, so familiar to us, has not been easy to explain. In a recent study of the subject, E. Metchnikoff has found that pigment atrophy of the hair is due to action of phagocytes, or white blood corpuscles, which absorb the pigment and transfer it elsewhere. In whitening hair and its roots the phagocytes filled with pigment are numerous, while they gradually disappear as the process progresses, and are almost completely absent in perfectly white hair. This discovery of the part played by phagocytes shows, for instance, that the sudden turning white of hair in a single night, or in a few days, is a result of increased activity set up in the phagocytes of the hair.

To utilize the vast energy of the earth's motion is now a dream of science. The late Prof. G. F. Fitzgerald supposed that the magnetic field of a charged condenser, with plates edgewise to the motion through the ether, might be traced to the earth's motion, and an experiment has been made by Dr. F. T. Troutman, F. R. S., to settle this point. The results have been negative. It is now pointed out that if the charging battery is responsible for the energy of the magnetic field, there are reasons for believing that the earth's motion tends to turn a charged condenser at right angles to itself, and a test is proposed with a delicately suspended condenser charged to a high voltage. If the expected result is obtained, continuous rotation will be possible from the power of the earth.

A new process recovers tin from waste tin-plate, and at the same time supplies an inexpensive electric battery. A suitable containing vessel is divided by a porous partition—which for cheapness may even be made of wicker-work. One side is filled with coal, which acts as cathode, the other side with the waste tin-plate, to serve as anode, and sea water or salt solution is used as charging liquid. The current from a number of such cells may be made to work an electric bath. The iron of the plates dissolves to ferric chloride, and the tin partly falls to the bottom and partly passes to the cathode.

In the ordinary arc lamp the carbons are heated to about 3,000 degrees, but in the new lamp of Dr. Bang, the Danish physician, they are kept so cool that they can be touched with the fingers while the lamp is burning. The cooling is due to the use of hollow carbons, through which a strong current of water is kept passing. The effect is remarkable, nearly the entire energy of the electric current being removed to the light arc between the two electrodes, while the latter are consumed so slowly that the usual automatic adjustment is unnecessary. For physicians' use numerous advantages are claimed. The cold light kills bacteria in one-eighteenth of the time required by the ordinary arc lamp, the patients can be placed much nearer the light than hitherto, and metallic electrodes—silver, iron, etc.—can be employed without risk of melting. The lamp being small and handy and consuming little electricity, it is expected to prove specially useful in other fields.

## VIEWS OF A RAILROAD MAN.

Paul Morton, vice-president of the Atchison, Topeka and Santa Fe Railway, in a recent address before one of the departments of the University of Chicago, discussing railway rates, argued for pooling privileges. The prohibition of pooling under the Interstate Commerce law, Mr. Morton said, "has resulted in a continuation of preferential rates, mostly of a secret nature, which are a menace to justice and fair play, and which ought to be obliterated." He thought that one of three contingencies faces the railways:

"(1.) The legalization of pooling, whereby the railroads may make enforceable contracts between themselves for a division of the business based on reasonable rates; or,

"(2.) The unification of ownership, which, in the absence of the first proposition, is making rapid strides; or,

"(3.) The taking over of the railroads by the government to own and operate them as is done in Germany and some other European countries.

"I have always been an advocate of legalized pooling, because I believe it will go a long way toward insuring a maintenance of tariffs and thereby prevent favoritism and inside rates to large shippers and great cities. I believe that the very foundation of the state itself is threatened by any long-continued discrimination against the small shipper and the small town." In arguing for pooling, Mr. Morton said: "I can see no good reason why Congress should not legalize pooling, as long as rates are reasonable. Rates can become unreasonable, and there is as much to fear from their being unreasonably low as unreasonably high. They can be so low as to be unremunerative; thereby