

says the New York *World*. It is called a pendulum chronoscope, and has excited widespread interest in the scientific world. It measures accurately down to the one-thousandth part of a second, and is expected to take the place at once of the old-style chronoscopes in scientific laboratories.

The idea of the instrument was originally suggested by Professor Chas. B. Bliss of the School of Pedagogy of the New York university. The machine was made and perfected by J. J. Hogan, the head of the mechanical department of the psychological laboratory of Yale.

Professor E. W. Scripture, of Yale, exhibited it during his final lecture on practical psychology at the Brooklyn Institute. It can be used with the quickness of a stop watch, and neither electrician nor mathematician is needed to operate the instrument.

Constructed on the pendulum principle, it measures the reaction time between sight, hearing or the operation of the will in muscular movement.

The instrument is a mechanical one, with simple electrical attachments. The speed of a cannon ball can be determined by the new timer, and it will tell the lapse of time between the firing of a revolver and the starting of a runner or determine how long it takes a sparrer to deliver a blow.

The new instrument is about two feet high, and is mounted in silver and nickel. It costs about \$200 to construct it.

A simple description of this new instrument is that it consists of a pendulum and a pointer swinging independently on the same axle. The tip of the pointer swings along the face of a curved scale or indicator, which is so graduated that it shows the thousandth of a second.

To measure the time required for the transmission of any given impression, a button is pressed and this sets the pendulum in motion and registers the result on the scale.

It has been demonstrated that on an average the reflex action for sound occupies .130 of a second.

In making a sight test when the pendulum comes in contact with the pointer a black shutter is raised from a light disk. As the disk flashes on his sight the subject touches the button and the pointer is at once stopped. It has been found that .300 of a second is the average time between the exposure of the disk to the sight and the pressure of the button.

When a test for discrimination is made the lifting of the shutter may show either a blue or yellow disk. The button is to be pressed by the subject if the disk is blue; if it is yellow the button is not to be touched. Tests show that on an average it requires about .010 of a second additional to discriminate colors.

The Hipp chronoscope is the one that has hitherto been in use, but it is controlled by delicate clockwork and is easily disarranged.

Professor Scripture maintains that muscular movements are in the domain of psychology proper. Quickness, steadiness and accuracy of movements are regulated by the will, and Professor Scripture said that students should be trained to quickness of thought.

Baseball, football and other athletic sports, he included in psychology.

"One of the greatest psychological studies," he said, "was the game of football." The reason a certain college was defeated for so many years was because of the bad effect on the wills of the players of previous defeats and the conviction of the onlookers that that team would be defeated.

MATERIAL FOR TANNING.

Much has been said and written of the value of cannaigre root as a tanning agent in the manufacture of leather, and after a time we may anticipate that some of the barren wastes of Utah and other parts of the West may be utilized in its cultivation for the supplying of local tanneries. It can be grown with little care and expense, and when there is a market for the root the cultivators of the soil will be as pleased to grow cannaigre as they now are to provide sugar beets for the factory.

The recent search for something to take the place of tannin in leather manufacture has not stopped, however, with the knowledge that gambler, cannaigre, etc., could become available. Among the plants that grow luxuriantly in the West, it has been found that sweet-clover, which sometimes is so abundant as to be classed as a rank weed, can be made to produce, in conjunction with other common plants, a first class tanning material. Upon this subject the following communication, written by M. M. Baldridge, of St. Charles, Illinois, to *Gleanings in Bee Culture* may prove of sufficient interest to lead to further inquiry:

It may surprise many to learn that the sweet-clover plant is of immense value to tanners of leather. A practical tanner, an expert in his profession, assures me that the fraternity can richly afford to pay 10 cents per lb., or \$200 per ton, for the sweet-clover plant when properly prepared for their use. A number of years ago this tanner offered me about 5 cents per lb. for the plant if I would supply him with it, and prepare it as per his instructions; but at that time I did not care to bother with the matter. There may be some practical tanners, or some who may know more or less about tanning the skins of animals, among your readers. If so, and if they should wish to know how to use the sweet-clover plant, as indicated, perhaps I can supply the information. The leather thus made is said to be of superior quality—in fact, when made with japonica and sweet-clover, it is equal to that which is commonly produced from the best quality of oak bark.

KILLED IN THE MINE.

SEATTLE, Wash., April 9.—A Whatcom, Wash., special says:

The *Post-Intelligencer* correspondent returned at 2 a.m. from the scene of a terrible disaster at Blue Canyon mine, fifteen miles from this city on Lake Whatcom, and is in possession of all the particulars now obtainable.

In the blacksmith shop near the entrance to the main tunnel lie the blackened bodies of twenty-three dead miners, while only two of all who were in the mine when the explosion occurred, lived to tell the story of the frightful catastrophe and their own miraculous escape.

The explosion occurred shortly after

3 o'clock, when the shift would have been changed, and the miners were already climbing the steep hill from the bunk house to take the places of the men killed. The disaster was undoubtedly caused by an accumulation of fire damp, which was exploded by a blast in the breast of the gangway. The faces of the men who were working in the breast are badly burned, but a majority of those who were working in the rooms off the gangway were only slightly disfigured by the fire and many of them not at all. Physicians and miners say that the men working in the breast must have been killed by the shock of the explosion, while the others succumbed to the fire damp as they slid down from the rooms to the gangway, then filled with deadly gas. This gangway is reached by a tunnel 750 feet long and the distance from the intersection of the gangway to the breast where the explosion took place is about 1,000 feet. The main shaft reached the gangway about 100 feet from the tunnel and air is supplied by water power and which was not affected by the explosion.

Kearns, the only miner who escaped from any of the rooms, says that he was not stunned, or even thrown down by the shock, though Morgan, who was working with him, was killed. Kearns' light was not extinguished and he saw no fire. He slid down the chute to the gangway, losing his light in some way, and managed to make his way in the darkness in some miraculous manner along the poisonous passage, over dead bodies and piles of coal, loosened by the explosion, to the open air, but before he reached the entrance, the work of rescue had already commenced. Out in the tunnel he met a party of brave miners groping their way inward as fast as the escape of the poisonous gas permitted. This party and others following pushed their way into the mine and carried out one by one the bodies of the dead miners as they came upon them in the gangway. The first body found was that of the mule driver, lying beside the dead animal, 950 feet from the mine entrance. From there to the fall of the gangway, a distance of about 800 feet, bodies were scattered along as they fell from the chutes leading to the rooms. Most of the bodies showed little evidence of struggle and in most instances death apparently came quickly. McAndrew's body was found buried under a slide of coal and McNulty was upon his hands and knees about twenty yards from where he had been working, and had his handkerchief tied over his nose and mouth.

When the correspondent left the mine, shortly before midnight, the work of washing the faces and hands of the dead men had commenced. All that is now possible is being done to alleviate the distress of the families of the deceased. The president of the company, M. E. Downs, now in New York, has been notified by wire. Coffins have been ordered and after the inquest tomorrow the bodies will be brought to this city.

An unknown prisoner confined in Westwood jail, Outo, for housebreaking, was fatally shot by Marshal Carter while attempting to escape.