

PHOTOGRAPHY

3200 Pictures a Second

Feeding movie film through a camera at the rate of three miles a minute to slow down rapidly moving machinery to about one two-hundredth of its normal speed is the feat accomplished by C. Francis Jenkins, of Washington. At the recent Detroit meeting of the Society of Automotive Engineers Mr. Jenkins told of the "chronoteine camera," one of his latest inventions, and how it may be applied to the study of automobile engines.

Instead of the sixteen pictures a second, taken by the ordinary movie camera, or the 128 taken by the "ultra-rapid" camera now frequently used in filming athletic events, the chronoteine takes 3200 pictures a second at its normal rate. If desired, it can be speeded up even further, and take as many as 10,000 a second. When these are projected in the ordinary machine at the speed of 16 a second, the apparent speed of the motion is correspondingly reduced. When taken at 3200 per second, the reduction of speed is 200 times, and at the higher speeds it is of course greater.

In the usual type of motion picture camera, the film is stopped for each exposure, so that it stops and starts sixteen times a second. At such high speeds as those employed in the chronoteine camera this is impossible, for the film would be torn to pieces. Therefore it is moved through in a steady stream.

A further difficulty is introduced, because with a single lens extremely short exposures would have to be made. Otherwise the picture would be blurred, just as if the object itself were close to the camera and moving at such a high speed. Mr. Jenkins has avoided this difficulty by providing 48 lenses, set in the periphery of a 13-inch disc, which turns at a speed of 4000 revolutions per minute. The film moves back of one side of this disc, so that the images formed by the lenses move right along with the film. In fact, the exposures overlap, as the exposure is begun through one lens before that through the preceding lens is completed. At 3200 exposures a second, each one is about one twenty-five-hundredth of a second in length. With the rapid lenses used, and sensitive film, this is easily sufficient for a fully timed negative in bright sunlight. In the ordinary movie camera, at 16 a second, each exposure is about one thirty-second of a second in duration.

(Just turn the page)

PHYTOPATHOLOGY

Pater Pathologorum

LEWIS RALPH JONES

When some future chronicler of the science and practice of plant pathology draws up the genealogical chart of twentieth century phytopathologists, he will find the ancestral lines converging upon Jones of Wisconsin as the patriarch of the tribe. Even now, with the first quarter of the century scarcely closed, he is already an academic grandsire. For while his own classrooms and laboratories at Madison are still active in filling the ranks of his profession with young recruits, many of his earlier students have in their turn gathered groups about them who will in their turn go forth to preach the new gospel for the salvation of plants from parasitic damnation.

The days of Professor Jones' ministrations have seen radical new revelations in plant pathology. The earlier science of plant diseases did not go much beyond compilations of lists of causal fungi, and the earlier practice of combating them consisted largely of drenching plants indiscriminately with "shotgun" sprays. Sprays are still the mainstay of the defense against such plant diseases as come to the surface, but attack on the hidden ills that plague the roots and interior organs, and even the hope of future combat against the surface enemies, are being sought in other ways. These ways are all based on the new gospel: study the physiologies of host and parasite, and the ecology of their inter-relations and of their several and joint responses to climatic and soil

(Just turn the page)

PHYSIOLOGY

Blood Pressure and Accidents

Why some motormen and bus drivers have the hard luck of getting their cars into accidents, while others sail along without much trouble has been investigated by two psychologists of the Personnel Research Federation.

A connection between health and accidents was discovered among older drivers, the psychologists, Dr. Walter V. Bingham and C. S. Slocombe, report. Men over 50 years of age with abnormal blood pressure had on the average more than twice as many accidents as men of the same ages and experience whose blood pressure was normal.

"It has not been generally recognized," they state, "that excessive blood pressure, even when it is not so high as to indicate danger of a sudden collapse, may nevertheless be a symptom of incipient nephritis or of some systemic condition which affects general health and temperament to an extent which they seriously interfere with safe driving."

The investigation showed that the longer a man has been operating a car or bus the fewer accidents he has. This is partly attributed to increasing skill and experience and partly to the fact that inefficient drivers tend to shift to other work. Men who learn to operate their cars economically by coasting as much as possible were also found to be more successful in avoiding trouble.

Science News-Letter, January 28, 1928

ASTRONOMY

Great Spot Crosses Sun Disc

One of the largest group of spots observed in recent months is now crossing the face of the sun, according to Prof. George H. Peters, of the U. S. Naval Observatory, Washington. Prof. Peters takes photographs of the sun every clear day, and he first noticed the spot, as it came around the eastern edge of the sun, on January 17. On Friday, January 20, he photographed it again, and estimated its size as approximately 125,000 miles, or about half of the distance from the earth to the moon.

Prof. Peters pointed out that several years ago he predicted that the maximum of the approximately eleven-year period, during which the numbers of sunspots wax and wane, would be reached late this year and that it now looks as if this prediction would be fulfilled.

Science News-Letter, January 28, 1928

News-Letter Features

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Pater Pathologroum

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conditions; and then on the knowledge thus gained base your efforts to prevent or cure. And, true to the new trend in the companion sciences of animal and human pathology, prevention is now being stressed rather than belated curative efforts against entrenched foes.

L. R. Jones was born at Brandon, Wisconsin, in 1864. He received his bachelor's degree at Michigan in 1889, and his doctorate at the same institution in 1904. His earlier teaching and search was carried on in Vermont; in 1909 he was called back to his native state as professor of plant pathology at the University of Wisconsin.

Science News-Letter, January 28, 1928

The only export of the Dalmatian coast is pyrethrum flowers, used in making insect powder.

The asphalt lake of Trinidad has been bored to a depth of 175 feet, without striking the bottom.

Proposed legislation would require paint manufacturers to print the formula of paint on containers.

3200 Pictures a Second

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Mr. Jenkins calls attention to the good photographic quality in the pictures, which is unusual in such high-speed studies. "The pictures are true photographic pictures having half-tone values like other motion pictures, not mere shadowy outlines of grayish silhouettes," he says. "They are made out-of-doors as well as in the laboratory, of large subjects or small subjects, and from a moving vehicle as readily as from a fixed platform.

"The chronoteine camera is an instrument for the study of many problems in science and engineering, some of which are not possible of accurate determination in any other way. Some additional applications of this instrument which immediately suggest themselves are a study of gun recoil, shell trajectories and plate impacts, airplane propellers and landing-gear action, bursting of balloons and air hose, tire action over obstructions, water streams, propagation of flame, engine-valve rebound at high speed; in fact, anything that moves too fast for the eye to follow can be shown slowed down and can be examined in detail at leisure and repeatedly."

Science News-Letter, January 28, 1928



WHAT PRICE KNOWLEDGE?

In ages of the past those who sought it—found it

But it was often expensive and limited to a few

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