



EVOLUTION OF MOVING PICTURE FILM

The introduction of a new moving picture film for amateurs again reduces the size of the frame from which a picture can successfully be projected and enlarged upon a screen. When ready for the projector, this new film is only eight millimeters wide—exactly half the width of the present amateur film and less than one-fourth that of film used in theatres. Each film is reproduced above in full size. The largest (left) is the professional film, the next (to the right) is the amateur size that has been used for a number of years, right of center is the new film as it is run through the camera and at the extreme right is the same strip cut down the middle to a width of eight millimeters for the projector.

PHOTOGRAPHY

Pictures of Stars Lead to New Miniature Movie Film

FINER grained photographic emulsion developed for recording sharp images of distant stars has allowed the commercial perfection of an eight millimeter amateur motion picture film that takes four pictures upon the film space of one ordinary amateur 16 millimeter movie frame.

Although experimentally perfected, the new type amateur motion picture camera, film and projector has not yet been put on the market by the Eastman Kodak Company in whose laboratories it has been developed.

The quadrupling of the number of images on a foot of film is accomplished by running a 16 millimeter film through a special type of camera twice. The camera takes twenty-five feet of film and is sufficiently small to fit into the coat pocket. The first time through one half of the width of the film is exposed. Then the film is changed from one reel to the other and the other half is exposed. Each picture taken is only half the depth of an ordinary 16 millimeter film image. Twenty-five feet of the new film will

therefore contain as many pictures as a hundred feet of the conventional amateur movie film and will run four minutes.

When the film is processed it is split down the center and the two pieces spliced end to end. Fifty feet of film, eight millimeters wide with perforations down one side, is delivered to the amateur photographer who must utilize a new eight millimeter projector in showing it.

The new eight millimeter movies are made possible by very fine grained sensitive photographic emulsion that resulted from a series of developments, among them the making of special films for astronomical use. The development of "kodacolor" amateur movie film, the research striving for sound film that does not distort, and the commercial production of supersensitive 16 millimeter movie film, also contributed to the perfection of the new movies.

High optical and mechanical precision is necessary in the eight millimeter movie apparatus. The fast anastigmat lens of the camera is the size of a

small pea but is made of three pieces of glass each separately ground on each side with extreme accuracy.

The film image of the new eight millimeter movies is less than a twentieth of the area of the professional 35 millimeter movie film image.

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GEOGRAPHY-BOTANY

Boy Scout-Naturalists Map Craters of Volcano

By **PROF. H. E. STORK**, of Carleton College, Director of Scout-Naturalist Expedition in Costa Rica. Dispatch from Cartago, Costa Rica.

THREE Boy Scout-Naturalists on a three months scientific expedition in Costa Rica, under the direction of the writer, have mapped the craters of the volcano Irazen.

The boys are combining adventure with the collection of insect and plant specimens. Their first project has been a week's camping trip on the volcano, which rises to a height of almost 12,000 feet.

One crater inside the large crater is now active, giving forth a great volume of steam and sulphurous fumes. The craters mapped by the Scouts show considerable changes from conditions as seen in maps made twenty years earlier. By excavating on the south and east sides of the mountain, the Scouts were able to read something of the long past history of the volcano's activity.

The Scout-Naturalists also assisted the writer in making a study of the plant life of this mountain. In the flora are a number of species found nowhere else.

The three Scouts on the Costa Rican expedition were selected from the Scout-Naturalist expeditions, which have done natural history work in the National Parks since 1929. The expeditions, consisting of selected Eagle Scouts, were begun in 1929 by Ansel F. Hall, chief naturalist of the National Parks, who believed that the organization of Boy Scouts of America might thus contribute to the advancement of science.

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A salad crop new to most gardeners is Chinese cabbage.

Australians are the world's greatest fruit eaters, judging by the per capita consumption of oranges and other fruits.