As a summary of these crop ratings, lands are listed as to their general agricultural worth or productivity. Each type receives a general agricultural rating, based primarily on its productivity for the great staple crops, particularly grass and grain crops. The most productive land is designated Grade 1. Land incapable of producing crops, such as rock outcrop or desert, is listed as Grade 10.

A supplementary index of productivity has been added in the case of all land types on which farm practice, mainly through the use of fertilizer, is more intensive than in standard practice. There are said to be some who believe this index to be the more important. It has the disadvantage, however, of becoming invalid with time and it gives no indication of the disadvantage of lands requiring fertilization to produce equivalent yields.

MOTION PICTURES AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

THE first of a series of animated scientific and engineering motion pictures designed to facilitate methods of teaching has been completed by the new division of visual education at the Massachusetts Institute of Technology. It presents for the first time in visual animated form the behavior of an electrical wave as it travels along a 250-mile transmission line.

Other films in the proposed series include the presentation of descriptive geometry in animated form, the operation of complex machinery, principles of physics, problems of human relations and many others. This method of visual education is expected to be particularly effective in helping students to grasp the meaning of many of the more difficult subjects, which are not easily described by conventional teaching methods. The films, while designed primarily for instruction of students of the institute, are expected to be available to other educational institutions.

The new film "Traveling Waves on Transmission Lines" is a combination of animation and outdoor scenes showing various types of high voltage power lines. What happens when a switch is closed and electricity flows along such lines is graphically presented in the form of a dark wave flowing along a power line. The picture reveals that for a few millionths of a second after a switch is closed the electrical wave flows back and forth on the line and is often accompanied by extra high voltages. The effect is similar to the wave forms produced when water flows into a trough, strikes the end and rolls back and forth, finally reaching a steady level. The same phenomenon occurs on a smaller scale when an ordinary household light is turned on.

The mathematical analysis of the complete effect is so complicated that it has never been worked out, even for the simplest actual conditions. The form and progress of the electrical impulses have, however, been accurately reconstructed in the department of electrical engineering at the institute from precise continuous records made at short intervals along the line which was carrying the impulse. The study was made on a laboratory model of a 250-mile power line in which actual operating conditions could be reproduced. It was carried out by Professor Louis F. Woodruff. The films produced by the new division of visual education are being directed by Frank H. Conant, head of the photographic service, in consultation with Floyd H. Ramsdell, general manager of the Worcester Film Corporation.

PHOTOGRAPHIC TELESCOPE FOR THE LICK OBSERVATORY

A GIFT of $65,000 for the construction of a powerful wide-angle star camera or photographic telescope at Lick Observatory on Mt. Hamilton has been received by the University of California from the Carnegie Corporation of New York. This announcement was made by President Robert Gordon Sproul following the receipt of official notification of the gift from President F. P. Keppel, of the Carnegie Corporation.

Director R. G. Aitken, of the Lick Observatory, states that the instrument which is to be built will be the largest and most powerful of its kind, taking in a sky area of six or more degrees at the equator, and recording all stars down to at least the nineteenth magnitude in a two-hour exposure.

Stars of the nineteenth magnitude are about 150,000 times as faint as any that can be seen with the naked eye. An instrument capable of recording them will, according to the most reliable estimates, allow astronomers to study almost 300,000,000 stars in the stellar system immediately surrounding the earth.

Dr. Aitken adds that this gift, aside from being the largest received by Lick Observatory since its founding more than fifty years ago, will provide an instrument which in many ways will be the most powerful at Mt. Hamilton. It will enable astronomers stationed there to extend their investigations of the stars in several directions.

Particularly it will make possible a study of the structure and dynamics of the stellar galaxy, including the question of its rotation. This study will be carried on by Astronomer W. H. Wright, who submitted designs for the instrument with this purpose in view. It is hoped that the telescope will be completed and ready for use before the end of 1936.

Lick Observatory opened its doors in 1888, although the money for its construction was made available, and the search for a desirable site began fourteen years