

Daylight Television by Bell System

Physics

Engineers of Bell Telephone Laboratories who over a year ago gave a remarkable demonstration of television recently disclosed some of the further progress which they have made during their continued researches by demonstrating a new transmitting device which is capable of putting upon the television circuit outdoor scenes. On the roof of the Laboratories actors boxed and danced, swung baseball bats and tennis rackets to appear in brightly illuminated pictures in one of the laboratories on the eighth floor. The present apparatus differs radically from that of the first demonstration when the scene to be transmitted was illuminated by a powerful artificial light and only the actor's head and shoulders appeared in transmission. With the improved apparatus the scene was illuminated by ordinary sunlight and covered the area occupied by two men engaged in a friendly boxing match.

In the first form of apparatus demonstrated in April of last year, the scene was illuminated by a rapidly oscillating beam from a powerful arc light and that limited the scene to be transmitted to a very small area. The new development frees television from one of its most serious limitations.

The scene or event to be transmitted is reduced to the form of an image by a large lens, this image being scanned by a rapidly rotating disc similar to that previously employed but much larger. The lens serves



THE LATEST IN TELEVISION. The apparatus used in recent daylight television tests when full length figures of men playing tennis, or boxing, on the roof of the Bell Telephone Laboratories in New York, were seen by wire in a room several floors below. In actual use the transmitter, at the right, is covered so that it is lightproof. There can be seen the large scanning disc, which breaks up the image of the lens into small parts, like the dots of this half-tone picture when viewed with a magnifying glass.

somewhat the same purpose in the television apparatus as the large lens of an astronomical telescope, and, like the latter, it should be large to gather as much light as possible.

The experiments show that moving persons and objects can be successfully scanned, although at a considerable distance from the lens and therefore in such a position that the focus of the lens does not require changing from moment to moment. Light passing through the lens and scanning disc is caused to actuate a light responsive device of extreme sensitiveness and generate an electric current which after amplification may be transmitted either by wire or radio.

The developments in television which were demonstrated were perfected by Dr. Frank Gray of the Laboratories working in collaboration with Dr. Herbert E. Ives. They illustrate the continued interest and progress of the telephone engineers in the problems of television, but the engineers themselves refused to prophesy as to future developments or applications. They pointed out that the improvement was in the television transmitter and that its use required no fundamental change in the two types of receiving equipment for use by either single individuals or by larger audiences which were developed and demonstrated a year ago.

Science News-Letter, July 21, 1928

Zinc and Boron Needed by Plants

Plant Physiology

The common metal zinc, together with boron, the chemical basis of borax, are needed by plants if they are to live and grow in full health, according to Miss A. L. Sommer and Prof. C. B. Lipman of the University of California. The amounts needed are exceedingly minute; one part of each in two million parts of the solution surrounding the roots will suffice, but without these microscopic quantities plants drag out a dwindling, sickly existence or even perish altogether. These minerals, together with several others needed in equally minute amounts, are likened by the experimenters to the almost undetectably small amounts of the

vitamins needed by man and the lower animals.

To test the response of plants to such low concentrations of the two elements, most elaborate precautions had to be taken, the two researchers report. Even the dust of the air might carry enough zinc or boron to feed a plant otherwise kept completely deprived of it by specially refined chemicals dissolved in double-distilled water; so a smaller greenhouse was built inside a large one, and all the air used in ventilating it carefully filtered. Since ordinary glass contains a little zinc, the jars used in part of the experiments were made of pyrex glass.

A number of different kinds of plants were grown in the culture jars. One set was given a properly balanced ration of mineral nutrients, but not zinc. Another set was similarly deprived of boron. Other plants were supplied with a full ration plus both boron and zinc, in the very low concentration of one part of each to two million parts of water. The plants supplied with both boron and zinc made a healthy and flourishing growth, while those that lacked either of the two elements showed only a fraction of normal growth or even failed to advance beyond the seedling stage.

Science News-Letter, July 21, 1928