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instead of a vertical movement, the needle moves from side to side. On this type of record, microscopic examination shows that there are no hills and valleys as in the vertical record. All recording equipment in use today, except that made by Western Electric and Fairchild, uses lateral recording. Both types of recordings can be played back on any good reproducing machine.

Professional disc recorders are produced by Presto, Fairchild, and Speak-O-Phone and others in portable units mounted in suitcases. Many manufacturers, including RCA, Scully, and Presto make professional studio equipment for stationary permanent installation. Home recording devices are manufactured by Wilcox-Gay, RCA, Emerson and others.

One of the latest developments in disc recording and reproducing is a sound pickup device for playing back recordings that rides in the groove of the record, eliminating entirely the pickup arm which heretofore held the needle. It consists of an L-shaped metal weight with a felt pad to protect the record on one branch of the L, and the needle with an electrostatic pickup on the other branch. Wires run from the device to the detector and amplifier. In operation, the device is set in the outside groove of the record by hand and, riding the groove, it travels the spiral path toward the center of the record. Supported only by the record itself, it picks up mechanical impulses as it moves along, which it converts into electrical impulses and then to sound.

Another new device is the Soundscriber, designed for office use. Employing an eight-inch vinylite resin disc, it will record up to 30 minutes of voice at slow speed. It can be used to record dictation, important telephone conversations or conferences. The records are small and unbreakable, so that they may be conveniently filed in a correspondence file for further reference. The big disadvantage of this otherwise handy device is that it records so many sound tracks so close together on the small disc that while the words are understandable, the voices do not bear much resemblance to those of the speakers.

One of the most recent combination recording devices, called "Radiotone" commercially, has been developed for the use of schools, industrial plants and institutions. This unit combines a radio, recording device of the professional type, and a public address system. Built by the Robinson-Houchin Optical Company, it may be used to record programs off the air from its built-in radio, from the public address system, or in the regular manner.

A fourth development, recently patented, is a recording device that will answer your telephone while you are away from home, record any message that the caller leaves, and play to the caller a recording of any message you wish to leave for him. It consists of two or more turntables mounted close together. Any turntable may be used for recording or reproducing. When your telephone rings, the vibrations of the bell actuate a detector which connects the telephone to the apparatus. The reproducing pickup is lowered to the record you have recorded and your message is played for the caller. Then a gong rings, and the caller is instructed to begin giving the message he wishes to leave for you.

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BOTANY

NATURE RAMBLINGS by Frank Thone

Thorns and Thistles

➤ WEEDS have been recognized as the gardener's worst enemies ever since the first garden was dug. "Thorns also and thistles shall it bring forth to thee," was the heart of the curse imposed on Adam; cause enough that he should eat bread only "in the sweat of his face." And no gardener since that luckless arch-ancestor has been able to evade the burden of hoeing or pulling up weeds.

Wherever man has gone, his weeds have gone with him. We know little enough about the origin of our field and garden plants; most of them came into cultivation before the beginning of written history, so that records are in the very unsatisfactory state of having no beginning. And, naturally enough, we know even less about those illegitimate waifs, the weeds, than we do about the more favored children of our gardens.

We have been able, though, to get some idea of how adept weeds are at stealing rides into new territory from the way they travelled into the New World when our European ancestors came over here. They brought with them a large proportion of our common garden and field crops: lettuce and rad-

ishes, peas and carrots, wheat and oats and rye, all came along with the white settlers; and so did pigweed and purslane, thistle and dandelion, velvet-leaf and jimsonweed and wild mustard, and others whose name is legion.

They arrived in all sorts of ways. Many, we may be sure, smuggled themselves in with supplies of garden and field seeds. Seed inspection, to keep such contaminants out of commercial seed supplies, has become a major function of federal and state agricultural departments, and despite the best efforts of the inspectors a certain small percentage of weed seeds still get by. Others probably came in ship-borne supplies of hay and straw used as feed and bedding for animals in transit. Still other weeds undoubtedly got their start on our shores when sailing ships dumped out the dirt and stones they carried in their holds as ballast.

A few weeds are plants that were brought in purposely and have since run wild—after the manner of the English sparrow and the starling. Such was the history of hemp, for example, brought in as foundation for a cordage industry that languished and died with the passing of sailing ships. Such also was the story of the teazle, whose prickly pods were once a necessary adjunct of the cloth-fulling industry. Some were originally ornamental plants, like the Australian saltbush on the West Coast and the Japanese honeysuckle along the Eastern seaboard.

But however they got here, and however little we want them now, they are here, and here they apparently are going to stay.

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● Just Off the Press ●

COASTS, WAVES AND WEATHER FOR NAVIGATORS—John Q. Stewart—*Ginn,* 348 p., illus., $3.75.

HOW TO SOLVE IT, A New Aspect of Mathematical Method—G. Polya—*Princeton Univ. Press,* illus., 204 p., $2.50.

HISTORY OF PHOTOGRAPHY—Josef Maria Eder—*Columbia Univ. Press,* 860 p., illus., $10.

INFRARED AND RAMAN SPECTRA OF POLYATOMIC MOLECULES—Gerhard Herzberg—*Van Nostrand,* 632 p., illus., $9.50.

INTRODUCTION TO MEDICAL SCIENCE—Lulli Lindh Muller and Dorothy E. Dawes—*Sanders,* illus., 454 p., $3.

JOB PLACEMENT REFERENCE, With Introduction to the Job Placement Technique—Keith Van Allyn—*National Institute of Vocational Research,* 356 p., $10.

MAN AND HIS FOOD—Labor's Committee on Food and Nutrition, cooperating with War Food Administration, paper, 8 p., Free.

A MANUAL OF TROPICAL MEDICINE, Prepared Under the Auspices of the Division of Medical Sciences of the National Research Council—Thomas T. Mackie and others—*Saunders,* illus., 727 p., $6.

MEN AT WORK, Some Democratic Methods for the Power Age—Stuart Chase—*Harcourt,* 146 p., $2.

PRACTICAL PATENT PROCEDURE—Lucy Brett Andrews—*Lucy Brett Andrews,* paper, 32 p., $1.

YOUR HAIR AND ITS CARE—Oscar L. Levin and Howard T. Behrman—*Emerson,* 184 p., $2.

YOUR VOICE, Applied Science of Vocal Art—Douglas Stanley, *Pitman,* 306 p., illus., $4.50.

VEGETABLE DYES, from North American Plants, Douglas Leechman—*Webb,* 55 p., $1.25.

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America leads the world in the production of *optical instruments* both in quantity and quality; prior to World War I many optical instruments for America were obtained from Germany, the war gave a great boost to the home industry.