RADIANCE COSMOS—Top winner of 1948 contest, this superior cosmos has deep rose blossoms, with a wide central zone of crimson surrounding the yellow central disk.

outstanding qualities. Those showing promise are crossed. First the tiny disk florets in the chrysanthemum center are removed, as shown on the cover of this week's SCIENCE NEWS LETTER, then they are hand-pollinated.

At present 50 new chrysanthemum specimens show some promise, but much work remains to be done. Only three or four will eventually turn out to be good and beautify your home.

Controlled breeding is a tricky process. The first step is to transfer pollen from the anthers or pollen-bearing part of the flower to the stigma or pollen-catching member of that flower or of one with which it is to be crossed. In some plants the pollen is produced by the same flower as the seed or by another flower on the same plant; in some the pollen must come from another plant. A plant that is to be self-pollinated requires but little special attention. In most cases the plant or its flowers can be enclosed in some sort of cloth, cage or paper bag to protect them from all pollen except their own. Some plants merely need to be shaken several times a day to scatter the pollen. Bees or flies must be introduced into the bag of others to secure the best pollination.

When one flower is to be crossed with another, every precaution must be taken to safeguard the stigma from all pollen other than that of the desired type. The plant's own pollen-bearing parts usually are removed before pollen is shed.

The anthers may easily be removed from such flowers as morning-glory, gladiolus and phlox. In these the pollen-bearers are large and easily distinguished. With other flowers it is more difficult to cut out the anthers without injuring the stigma.

With zinnias, asters, cosmos and other composites, where the male parts are so tiny they can be seen only through a magnifying glass, the task is made easier by the fact that the tiny florets are not all alike. Those that stand out around the flower like sun rays usually have seed-bearing organs but do not bear pollen. The tiny florets crowded in the center bear both pollen and seed—these complete florets are removed. The remaining ray-florets bear seed when pollen from another flower is introduced. In producing the first Radiance cosmos, this task was attempted many times before a cross was successful.

Care must be taken in cross-pollinating all flowers. The forceps or other tools used to cut away unwanted parts should be kept absolutely clean. They are often dipped into alcohol after each use so that no pollen will be carried from plant to plant. The camel's hair brush used in applying the pollen is also cleaned.

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Science Service Radio

➤ LISTEN in to a story of a Venezuelan expedition on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST Saturday, April 17. Mr. Watson Davis, director of Science Service, will interview Dr. Dale Jenkins, member of a special technical mission connected with the Food and Agriculture Organization. Dr. Jenkins will tell about the vast untapped areas of palms from which edible oils could be commercially exploited.

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ASTRONOMY

To Measure Stars' Light

➤ AMATEUR astronomers of the future will not be satisfied with just telescopes, even relatively large ones. They will consider an instrument for accurately measuring the brightness of a star as necessary equipment, if they act on the suggestion of Dr. John S. Hall of Amherst College Observatory.

Each month thousands of useful observations of variable stars are made by amateurs. The value of this work can be greatly increased by a little extra equipment, Dr. Hall suggested. A light-sensitive instrument would take the guesswork out of such observations.

The photoelectric photometer is used with striking results by professional astronomers. A form of this instrument suitable for accurate observation of stars with a small telescope has been greatly simplified by war-inspired advances.

Dr. Hall spoke to amateurs attending the meeting of the Northeast Region of the Astronomical League. They had assembled in New Haven at the invitation of Dr. Dirk Brouwer, director of Yale University Observatory.

"The day is at hand when the amateur astronomer can attach a photomultiplier —weighing with its container no more than a few pounds—to his telescope," Dr. Hall pointed out. "He can carry this instrument to his backyard or to a nearby hilltop and make observations good to 0.01 magnitude."

The amplifier, meter and associated batteries could be enclosed in a carrying case not much larger or heavier than a portable radio. The star-enthusiast would set this equipment on the ground, find the variable star in which he is interested and one or two stars of known brightness with which to compare it. These observations would be several times more accurate than if he had attempted to estimate their brightness by just looking at them through his telescope.

Dr. Hall and John F. Jewett at present are developing at Amherst College Observatory a compact, rugged amplifier for field use.

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