

hour, since the Martin B-26 has the same power plant and moves through the air at this speed though it is a heavier plane.

In general, night fighters are heavily armed. For operations in a localized area, special radar equipment is used. Enemy planes, first detected on a long-range radio set, are reported to the ground station at the airport where the night fighters are based. Directions are

given to the night fighter pilots which will enable them to bring their planes to positions fairly close to the enemy bombers, preferably behind them. The radar operators aboard the night fighters then switch on their interceptor equipment, which spots the enemy planes at fairly close range, keeping pilots advised of their location until it is time to fire.

Science News Letter, July 1, 1944

GENERAL SCIENCE

Languages in a Hurry

Malayan, Arabic, Burmese, Chinese and French quickly learned by speaking language in class and by training oneself to "think" in the foreign tongue.

► **TEACHING** 15,000 Americans to speak such languages as Malayan, Arabic, Burmese, Chinese and French was speeded by having them speak the foreign language in class from the first day, eliminating or postponing the study of little-used constructions, and having them "think" in the foreign language. Students in these classes conversed with natives from all walks of life—economists to pearl divers.

Searching for ways in which the procedures followed in the Army Specialized Training Language Program could be adapted to peace-time teaching of foreign languages, a special committee working under the Commission on Trends in Education of the Modern Language Association of America found that although no single method of presenting the language had been universally adopted in these intensive courses, several outstanding tendencies marked the classes.

The students were given a chance to progress according to their several abilities. The classes were kept relatively small and frequent promotions and demotions made so that the trainees with aptitude were not handicapped by those who learned more slowly. Every one in the group was called on frequently to speak in the foreign language.

The problem of whether fluency or accuracy was more important was met by compromise in most of the classes. Fluency was usually the primary objective in the early stages, but accuracy was stressed with the more advanced groups.

Designed to give students command of the colloquial spoken form of a foreign language, the Army Specialized Train-

ing Language Program, given at many colleges and universities throughout the country, was intended to make up as quickly as possible for our weaknesses as a nation in practical knowledge of foreign languages.

The first language course began in April, 1943, and by the end of the year approximately 15,000 trainees were studying languages under this system.

The curriculum was based primarily on experience derived from the Intensive Language Program of the American Council of Learned Societies which had been in operation for two years.

The course was designed to give the students 10 to 12 hours a week of oral practice in the foreign language, in small sessions with a native speaker, and three to five hours a week of formal instruction in the structure of the language studied.

"The people who were engaged to conduct the drill sessions represented, without doubt, the most heterogeneous group ever assembled anywhere to teach languages," the report states. "Besides some teachers of languages, there could be found economists, political scientists, lawyers, judges, poets, novelists, Army officers, school girls, housewives, barbers, a pearl diver, and even a former numbers-racket specialist."

A number of unusual techniques were used to capitalize on the feeling that language is not merely something to learn about, but something which we speak.

Songs and proverbs were used frequently in some classes because their melody and rhythm make them easy to learn. Good phonograph records were also employed. Lively plays, with



GORILLA SIZE—That Dr. Franz Weidenreich's estimate of *Meganthropus paleojavanicus* as "big as a big male gorilla" (*SNL*, June 24, p. 409) is not exaggerated can be judged by comparing the jawbone fragment (upper right) with the homologous part of a modern gorilla's jaw (right). Below are similar parts of chimpanzee (left) and human jaws (right)



CHINESE OGRE—One of the enormous but still evidently human teeth dug up by Dr. R. von Koenigswald in a Chinese apothecary's shop is shown at the left, and for comparison molars of gorilla, Peking man and modern man. The big tooth has six times greater volume than the modern one.

"walking rehearsals" in the foreign language, were sometimes given.

While the main purpose of the ASTP in foreign language was to teach trainees to speak and understand the language, they learned to read as well, the committee reported. But reading in this case means reading for the ideas in the text, not translating.

Dean Henry Grattan Doyle of the George Washington University in Washington, directed the survey group. Members of the group were chosen for

their competence in several foreign languages, successful experience as teachers, good judgment, and freedom from prejudice in favor of any particular teaching method. Others in the survey group included Drs. Frederick B. Agard, Princeton University; Robert J. Clements, Harvard University; William S. Hendrix, Ohio State University; Elton Hocking, Northwestern University; Stephen L. Pitcher, St. Louis Public Schools; and Albert van Eerden, Princeton University.

Science News Letter, July 1, 1944

CHEMISTRY-PHOTOGRAPHY

Color Film For Public

Processing of this film can be done at home in 90 minutes, with only 15 minutes in the darkroom. It is available in sheets and 16 millimeter movie film.

➤ A NEW COLOR film that can be processed in the home in 90 minutes with only 15 minutes in the darkroom is now available in New York City to the general public in sheet film and 16 millimeter movie film. Distribution will be expanded to other parts of the country as rapidly as possible. Until now the film has been made exclusively for the Army, Navy and war industries.

The new film, developed by the Ansco Corporation, is based upon the original Fischer patents. These patents advanced the theory of colorless dye-forming substance as a part of the emulsions, the substances forming their own dyes upon reaction with a color-developing fluid. The tendency of the color-formers to diffuse

through the three emulsions led to the virtual abandonment of the process.

Ansco color film reproduces color images through what is called subtractive color synthesis. It is based upon the theory that almost all colors can be reproduced by re-establishing a proper ratio of the blue, green, and red rays reflected from the object photographed. The film is composed of three layers of photographic emulsion. In the top layer, light-sensitive silver halide crystals, common to all photographic emulsions, record the blue light reflected from the object photographed. In the middle layer, the silver halide crystals are sensitive to blue and green, and in the lower layer they are sensitive to blue and red.

A yellow filter layer, between the top and lower two emulsions, stops the blue rays from progressing farther after making their record on the top emulsion. Therefore, the green rays reflected from the photographed object are recorded on the middle emulsion and the red rays on the lower without the blue coming into play.

Using the special color developer, the amateur photographer then brings out the positive color images in the three emulsions. Photographic prints can be made from these color negatives by the usual three-color separation method. At some future time, it may be possible to simplify the printing of three-color pictures by using printing paper which is essentially the same as the new color film.

One other advantage of the new color process is the fact that after the first 15 minutes of the developing period, the film may be stored or shipped and processing completed at some future time. This enables a photographer quickly to check his color pictures as he makes them, leaving the longest part of the developing process until some later time.

Other processes by which color pictures can be made today are the Kodachrome process of the Eastman Kodak Company, which is similar to the new Ansco color film but which cannot be processed in the home; the wash-off relief process; the Carbro process; and the Finlay process. Kodachrome and Ansco color film are the most satisfactory from the amateur photographer's standpoint since they require no specialized training in handling, and may be used with most cameras.

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INVENTION

New Flying Bulldozer Can Alight on Water

➤ A FLYING bulldozer is the ambitious invention on which E. W. Austin of Cedar Rapids, Iowa, received patent 2,351,799, which he assigned to the La Plant-Choate Manufacturing Company. The earth-working machine, a necessity for the quick development or repair of wartime landing areas, is suspended beneath the plane, and is equipped with removable floats so that it may alight on the water. Once it has crawled up on shore, a take off from the plane's rear-placed engine supplies power for the tractor treads.

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