

tude. Will it pass over the ridge ahead? The pilot pushes the "stick" back to keep the glide at its maximum efficiency. Greatest forward distance for the least drop is the watchword. And yet the nose of the sailplane must not rise to a point where a stall will occur.

Yes, the bird-like machine and its human occupant are successful. Over the peaks of the ridge they go to reach the windward side. Now come the upward air currents again. The pilot turns the nose of the glider parallel to the ridge and executes great circles, ovals and figure-eights back and forth, gaining altitude and surveying the layout of land ahead. Twenty-five minutes or a half hour may be spent in such maneuvers if nothing better presents itself ahead. The next ridge of hills may be two miles away.

### A Friend in Need

But here comes another friend; another cumulus cloud. Patiently the pilot weaves back and forth waiting for it to come overhead. The upward air currents coming over the ridge become even stronger.

Instead of hovering just above the peak of the ridge the glider now gains height. Five hundred feet above the ridge it soars. Then 600; finally 700. That ridge two miles away can be scaled if the glider is just a little less than 800 feet above it at the start of a long glide.

The experienced eye of the glider pilot finally tells him that the safe 800 feet height has been reached and away he goes to surmount the distant obstacle. And thus the aerial "hop-skip and jumping" goes on.

### Above the Clouds

In exceptional cases a glider pilot may be able to take his ship right up into a cumulus cloud and in some cases above it. Such was the fortunate happening which enabled Robert Kronfeld to set the altitude record of over 8,000 feet. He went right up through a great cloud, emerged on top and then "hopped" his way from one cloud to another in a journey that covered ninety miles. For more thrills and hazards German glider pilots occasionally fly inside great thunderclouds.

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Decayed teeth were more prevalent among upper class Egyptians than among the peasants who ate simple, coarse foods, a study of ancient skulls shows.

### PSYCHOLOGY

## Even the Best of Singers Carol Off True Pitch

**O**PERATIC and concert singers, even the most noted artists, habitually sing off pitch. This was the charge made by Dr. Harold G. Seashore, Eastman fellow in psychology of music at the State University of Iowa, at the recent meeting of the American Psychological Association.

Such variations from the true pitch of a song are probably unconscious on the part of the singer, Dr. Seashore indicated, although they may not be errors, either. Certainly the listener hears the performance as correct and artistic; the variations are not detected by the ear. In fact, Dr. Seashore considers it probable that if the singer were to sing rigidly in true pitch, his performance would be considered thin, mechanical, and lacking in feeling.

The singers studied included such well-known concert and operatic artists as Richard Crooks, Louise Homer and Lawrence Tibbett, as well as two college voice instructors. The songs were in legato style and varied in difficulty from "All Through the Night" to two Handel arias. The voices were recorded by means of a sound photographing device called the strobophotograph which recorded graphically each variation in pitch and intensity, however minute.

The photographic records revealed that what is heard as a single note when sung by the artist is really a vibrato or oscillation between two pitches which may be as much as eight tenths of a musical step apart.

From 78 to 85 per cent. of all tones are off-pitch some of the time, with an average deviation of one tenth of a step, Dr. Seashore found.

### Hunt For Pitch

"Apparently singers to a degree 'hunt' for the correct pitch and interval extent," Dr. Seashore said. He concluded, however, that the errors found are not due to motor skill deficiency or to auditory misjudgment, but are deviations necessary for the legato flow of the song.

Gliding attacks, or the sliding up to the note sung, were found to be more common than musicians are willing to admit.

"Gliding attacks are universally condemned although we can now demonstrate that all good singers sing many tones with a rising pitch glide, sometimes as great as several whole tones," Dr. Seashore said. With Miss Homer, 13 per cent. and with Mr. Crooks, 33 per cent. of all the tones in the songs were begun with rising pitch glide. Falling gliding attack was found to be rare.

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### INDUSTRIAL MEDICINE

## Persons With Good Noses Selected to Work in Dust

**M**INERS must have good noses. So must stone cutters, grinders, sand blast men, and others who work in an atmosphere laden with rock dust or other abrasive particles, if they would keep their health and avoid lung troubles. For an important function of the nose is to filter out these particles and prevent them from entering the lungs. And noses differ greatly in the efficiency with which they perform this function.

Dr. Gunther Lehmann of the Kaiser-Wilhelm Institute for Workman's Physiology examined 426 noses. They belonged to miners. Of the 426 miners, 241 were ill with lung troubles, 185 were well.

The noses were tested by blowing into them air laden with a fixed amount of dust, and allowing the air to issue from the mouth while the breath was held. The dust content of this air was then measured and the percentage of the original content filtered out by the nose was thus determined. The healthy miners were found prevailing among the high percentages, the affected miners among the low percentages.

Dr. Lehmann recommends that no man be admitted to a dusty job unless he passes such a nose test. Had this been done, he states, with the miners he examined, 205 out of the 241 that fell ill would have been saved from their illness. Under no circumstances, he insists, should mouth breathers be accepted for such jobs.

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