

PHYSIOLOGY

Different Breathing May Cause Scientists' Diverging Views

Those Who Hold Everest Cannot be Conquered Without Oxygen Said to Have Sea-level Respiratory Centers

THE CONQUEST of Mt. Everest, the world's highest mountain, altitude 29,141 feet, is a future feat which interests scientists greatly.

Physiologists are divided into two camps over the question of whether oxygen should be used to assist the climbers who attempt to scale this great height. Some, like Prof. J. Barcroft of Cambridge University, contend that the climbing of Everest is now merely an engineer's problem, that of designing a light and efficient oxygen breathing apparatus. Others, particularly Dr. J. S. Haldane of Oxford, feel strongly that the attack on the mountain can be made without the aid of oxygen and that the mountaineers can become acclimated to the rarefied air.

That this disagreement arises not so much because these British scientists think differently but because they breathe differently, is contended by Prof. Yandell Henderson, the Yale physiologist and authority on respiration.

There are two types of men, those who acclimatize slowly and with difficulty and those who readily become adjusted to low pressure of oxygen.

The first type suffer from prolonged mountain sickness and it is they who earnestly advocate the use of oxygen. They have what Prof. Henderson calls "sea-level respiratory centers." For them oxygen is the breath of life. They are the ones who should fly direct and wholly unacclimatized to the North Col of Mt. Everest, don an improved oxygen apparatus, make the ascent and get back below 15,000 feet while the supply of oxygen holds out. For them the ascent is an engineering problem.

But the other sort of person becomes so well adjusted during the slow ascent through Tibet to the starting place of the real climb, that Prof. Henderson believes a party of such persons might reach the summit without oxygen apparatus. The feat would be difficult and the risk great, but it would be safer without oxygen apparatus for this type of mountaineer.

The serious disadvantage in wearing an oxygen apparatus after acclimatization at a great height is due to the physiological fact that the blood alkali is reduced in proportion to the altitude and oxygen pressure. As the ratio between the blood acid and alkali must be kept balanced at high altitudes as at sea level, breathing must be speeded up at great heights in order to remove the blood's acid in the form of exhaled carbon dioxide. Prof. Henderson finds that a man adjusted to sea level breathes at rest 5 to 7 liters (quarts) of air per minute and when exercising 40 to 60 liters per minute. At the altitude of the North Col of Mt. Everest, an acclimatized person breathes 10 to 14 liters at rest, and 80 to 120 liters when exercising. Exhaling and inhaling 80 to 120 liters of air a minute is intolerable for more than a minute or two, and a man can not walk while breathing at this rate.

Donning an oxygen apparatus after becoming adjusted to rare air does not make the heavy work of climbing easier, for the increased amount of carbon dioxide produced induces so large a volume of breathing that the climber can take only a few steps at a time.

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ENTOMOLOGY

Raising Houseflies Now a Business

HOUSEFLIES, usually regarded as pests to be swatted or sprayed out of existence as quickly as possible, are purposely raised in large numbers, and improvements in the technique of their rearing are matters of real scientific and commercial concern. Flies are desired by manufacturers of fly-killing sprays, who test the deadliness of their products on them.

Henry H. Richardson of the U. S. Department of Agriculture has developed a medium for feeding the young or larval stage of flies, which is stated to

be an improvement over the hitherto universally employed stable waste. The latter is disagreeable to handle, sometimes unobtainable, and often harbors parasitic red mites which attack flies and render them unsuitable for experimental purposes. Mr. Richardson's medium consists of wheat bran, alfalfa meal, water, yeast and diamalt, a commercial product containing a large percentage of malt sugar.

The research on the new fly-raising food was conducted by Iowa State College at Ames, as a Crop Protection Institute project, backed by funds from a prominent oil refining company. Mr. Richardson's description of his medium is published in *Science*.

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PALEONTOLOGY

Important Mammoth Find Uncovered on Golf Course

FIVE TEETH and several bone fragments of the woolly mammoth, the largest single find of this huge Ice-Age mammal ever made in the East, have been discovered on a golf course near Philadelphia, and were placed on display at the Academy of Natural Sciences in Philadelphia.

The fossils were found by a workman during the course of steam shovel excavation for a new water hazard. They were buried four feet under ground. The teeth weigh from three and a quarter to six and (*Turn Page*)



FIVE ENORMOUS TEETH

These teeth of the Woolly Mammoth, with several bone fragments, constitute the largest find of Mammoth remains yet made in the East. The huge curved tusk was already in the Museum of the Philadelphia Academy of Natural Sciences. The model shows how the animal appeared in life.