

PHYSIOLOGICAL RESPONSES TO  
INTERMITTENT HEAT STRESS

by

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## INTRODUCTION

In spite of the amazing technical progress achieved during this century, many people still must work in hot environments to earn their living. The strain shown by the workers to the stress of the hot environments is indicated by increased heart rate, sweating, skin temperature, and core temperature (usually measured as rectal temperature). Therefore workers often take breaks, either on a formal or informal schedule, to recover from the heat stress.

Numerous experiments have been performed to determine the physiological effects on the human body of hot work environments. However most of them use non-acclimatized subjects exposed to continuous heat for one or two hours.

In 1943, for the first time, Robinson, et al. investigated the period of acclimatization to hot environments ( $T_{db}$  40° C, rh 23%,  $ET^*$  35.5°C) and loss of acclimatization after exposure ceased. They found that, by measuring heart rate, average skin temperature and rectal temperature, men were acclimatized rapidly during about seven days and thereafter slowly up to 23 days, and that men lost acclimatization during about 21 days after exposure ceased. Robinson (1949) also investigated variations of rectal and skin temperature of one highly acclimatized subject. The subject was exposed to increasing effective temperature from  $ET$  17°C to  $ET$  38°C while resting (110 Watts) and walking on a treadmill maintaining his metabolic rate at 440 Watts. He found that both skin temperature and rectal temperature, which were measured at the end of two hour exposure, increased smoothly while resting, but sharply while walking as environmental temp-