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2) Female subjects feel more uncomfortable than male ones in the conditions of same increments of skin temperatures in exposed sites.

3) Most subjects feel uncomfortable in the condition (C) 40°C 2m/s.

4) Female subjects feel more uncomfortable than male ones in the same levels of thermal sensation.

A17 Effects of Head Cooling on Physiological Responses During Submaximal Work

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Physiological reponses, especialy tympanic membrane temperature and cardiac output by Co_2 rebreathing method were measured during head cooling and body heating at rest and submaximal work (work intensity: 25% Vo_2max and 50% Vo_2max). The cap and vest were made for head cooling and body heating respectively. The tube sewn on to the cap and vest was connected to the water bath regulated the constant water terperature. The water temperature for head cooling was 15°C and that for body heating was 45°C. The data obtained during body heating with head cooling were compared with those during body heating. The cardiac output during exercise at work intessity of 50% Vo_2max by body heating with head cooling was significantly small compared with that by body heating.

A18 Physiological and Psychological Responses of Heating Local Body Part

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The purpose of the presents study was to evaluate effects of physiological and psychological responses of heating local body part. Six college-age females (20.8yrs, 155.0cm, 47.9kg) were used as subjects. Heating conditions divided into three types; heating of head (H), body (B), wholebody (W). Rectal temperature, skin temperature, heart rate, sweat rate and thermal sensation were measurement. Room temperature was 28°C in 20minutes, and then it was risen from 28°C to 38.5°C for one hour gradually. Heating rate was 10.5°C per hour.

Main results were as follows.

In all conditions, the skin temperature of heated parts increased naturally. Mean skin temperature in B and W conditions were increased gradually. Although it in H condition was keep constant. However H condition showed differencial tendency contrasting B condition and W condition. Subjective thermal sensation in H condition did not change and heart rate decreased with time during the experiment. On the other hand, heart rate in two conditions were increased little by little.

A19 Relationship among the Threshold of Wind Sensation, Wind Direction and Clothing

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In experiment I, the subjects were 10 Japanese female students (22.5yrs, 158cm, 48kg). A rectified light breeze was generated using an electric fan and honeycomb. The exposure parts to wind were the head and legs. The legs had two conditions, namely nakedness and pantihose wearing. The wind directions were front, side and back. In experiment II, the subjects were 5 female students (22.0yrs, 160cm, 49kg). The condition of clothing were no-sleeve, half-length sleeves and long-sleeves. The exposure parts to wind was the upper half of the body. The wind direction was front. The mean value of threshold of wind sensation was 13cm/sec. There was not seen a significant difference between nakedness and pantihose wearing and among the three sleeve conditions statistically. The threshold of wind sensation somewhat increased when the wind direction was back however there was not seen a significant

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difference among the conditions of wind direction statistically.

A20 Relationship of Physiological Reaction to Thermal Comfort

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In order to evaluate for the thermal comfort, relationship of physiological reaction to comfort and thermal sensations at thermal neutrality was examined. The test ten subjects were exposed to three indoor conditions that room temperature(Ta) was 26.8°C and mean radiant temperature(Tr) was 26.8°C, Ta was 27.4°C and Tr was 26.2°C, Ta was 28.0°C and Tr was 25.5°C in summer, Ta was 21.8°C and Tr was 21.8°C, Ta was 21.2°C and Tr was 22.6°C, Ta was 20.6°C and Tr was 23.4°C in winter. The test subjects were measured physiological reaction (skin temperature, blood flow,blood pressure, pulse rate, brain waves) and psychological reaction (thermal comfort, sensation).

The rsults were as follows

(1) If each combination of room temperature and mean radiant temperature has been changed under equal PMV environment, it made little difference on thermal comfort, sensation and physiological reaction.

(2) Thermal comfort in heating was highly correlated with blood flow.

A21 Effects of Cltthing on Aquatic Locomotion

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The effects of clothing on aquation location were sturdied in fourteen collage-females (22.4yrs, 157 cm, 48.0kg). The experimental conditions were locomotion 13m in length, 1.3m in depth, mean air temperature of 28.4°C, mean water temperature of 27.5°C. The subjects divided into walking group and swimming group, number of them were 6 and 9, respectively. Swimmig groups were divided into breaststroke and crawl, number of them were 5 and 4, respectively.

The clothing conditions were swimming, summer and winter wear. The conditions of shoes were putting on or taking off. The time required, pulse rate, and questionaly were recorded.

The main results were as follows;

1) The time required increased by wearing winter wear, crawl showed the remarkable delay.

2) When the subjects put on shoes, the time required increased.

3) The swimming group showed the low values of subjective evaluation for winter wear.

A22 Charactersitics of Human-Machine Interface in Operation and Control —Adjusting Time and Operational Error in case of Analog Meter—

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In the dial operation, operation time and target error were studied experimentally. The relations between time, error and control ratios, resistance torque, target value were analyzed. From the experimental data, operation characteristics were analyzed based on the operation time at each operation stage classified according to operation patterns. In this report, the time characteristics in fine adjusting stage were investigated. The results indicates that the time consumed for fine adjusting operation is scarcely affected by the absolute value of target, the frequency of adjusting error increases with control ratio, and absolute value of error becomes larger with the increase of resistance tor-

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