Bio-Power

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The law of conservation of energy states that the total energy of an isolated system is constant, energy can be transformed from one form to another but can neither be created nor destroyed. Human bodies have a broad range of thermal energy based on age and activity. After physical activity, the heart rate jumps, and the palm temperature increases. This experiment's rationale is to test whether this small temperature gradient can be effectively harvested into electrical energy to power biomedical micro-devices. An exerted body compared to a rested body has more beats per minute and increased temperature. The thermal energy produced from the palm is harvested by converting thermal energy into electrical energy using semi-conductor thermoelectric devices. Voltage is produced based on the level of the temperature gradient. Such voltage produced is captured and repeated over three different materials (heatsink, aluminum plate, and copper plate). The captured data is plotted on the bar graph. The bar graphs show each data category in a frequency distribution, display relative numbers, clarify the trends. Results show the amount of bio thermal energy voltage produced at rest with 101 beats per minute (bpm) heart rate with palm temperature of 87.5°F and after physical activity around 140 bpm with palm temperature of 95°F. If we can produce electricity based on temperature differences, then we can harvest bioelectric energy because human bodies have a broad range of thermal energy based on age and activity.

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