

## RESEARCH QUARTERLY

adults after lifting a 25-pound weight 5, 10, 15, 20, and 25 times per minute are tabulated below :

| <i>Lifts per<br/>Minute</i> | <i>Recovery Time<br/>in Minutes</i> |
|-----------------------------|-------------------------------------|
| 5                           | 2.7                                 |
| 10                          | 2.8                                 |
| 15                          | 3.3                                 |
| 20                          | 10.9                                |
| 25                          | 14.0                                |

An examination of this table reveals that the recovery time is prolonged as the intensity of the exercise is increased. In the majority of subjects, the heart rate returns to the resting level within 3 minutes after 5 to 15 lifts. After 20 and 25 lifts, however, most subjects require 9 or more minutes to recover.

The greatest variation in recovery time between subjects is found when the more intense exercises are used. Everyone responds nearly alike to the mild exercises, 5 to 15 lifts, but after 20 to 25 lifts, a wide variation is noted.

*The Effect of the Resting Pulse on the Recovery Time.*—Correlations between the resting rate and the recovery time following the five intensities of weight-lifting exercises performed by the above subjects are shown below :

| Lifts per<br>Minute | Mean Recovery<br>Time | S.D. | Correlation with<br>Resting Pulse |
|---------------------|-----------------------|------|-----------------------------------|
| 5                   | 2.70                  | 2.02 | — .200                            |
| 10                  | 2.80                  | 1.13 | — .034                            |
| 15                  | 3.30                  | 1.60 | .078                              |
| 20                  | 10.90                 | 7.00 | — .093                            |
| 25                  | 14.00                 | 6.20 | — .266                            |

By referring to this summary it may be seen that there is no significant relationship existing between the resting pulse and recovery time at any intensity of the exercise.

### SUMMARY AND CONCLUSIONS

The development of an electric cardiometer makes possible a more accurate study of certain phases of the response of the heart to various types of exercise, namely; (a) the nature of the recovery of the pulse rate following exercise, and (b) the factors which affect the response of the heart to exercise.

Data on the post-exercise pulse rate support the following conclusions :

1. The reliability of the pulse rate for two minutes after exercise is directly related to the strenuousness of the exercise. Thus, if the response of the heart to exercise is to be measured, the exercise must be strenuous enough (40 to 50 stool steps per minute) to overshadow environmental stimuli which affect the pulse rate