

afterward, after two, four, and six minutes of rest in order to determine CONDITION.

Pulse Rates	Before	Immediately after	After 2 Min.	4 Min.	6 Min.	Sum or Index
1st day's average	78	131	105	98	82	494
5th day's average	75	113	90	80	75	433

The lessened number of heartbeats to do more work in a standardized pattern indicates that it costs less to do more when training and conditioning have increased Production. When the five pulse rates add up to less than 450 it is a sign of good conditioning. The factor of less heart beats is generally a sign of better condition. The time of complete recovery of the original pulse rate is more indicative of good condition. As will be noted in Figure 4, there is comparatively more recovery in the first two minutes of rest than there will be in the next half hour. This indicates the need of frequent short rest periods with spurt periods of work leading to greater development and improved function.

The average Production of each day paralleled with the average pulse index of that day can be plotted into a curve of improvement. The Production or the number of foot contacts go up. The costs in heartbeats go down. At the end of the fifth day Production is up 8.27% and the Costs are down 12.34%.

	1/5/43	1/6/43	1/7/43	1/8 A.M.	1/8 P.M.	
Production	278	283	297	298	301	up 8.27%
Costs in Pulse Rate	494	475	455	448	433	down 12.34%

## 2. Senior High School Series of Fatigue Curves 1943— Training and Conditioning

Twenty athletes of the Wilmerding, Pennsylvania, High School, under Walter West each produced a fatigue curve daily for ten days to aggregate 200 fatigue curves. The average figures, inning by inning, for the entire period offer further support to prove the fatigue curve an instrument of measuring effort to demonstrate declining returns. The average Production of 200 different curves 1/20 to 2/2/43 by innings is given below and results in a perfect fatigue curve.

Innings	1	2	3	4	5	6	7	8	9	10	Production	Application
Average Repetitions	45	44	43	42	41	38	37	36	34	27	387	100%

This series of fatigue curves of twenty Wilmerding High School basketball players are again reviewed to go further than to merely