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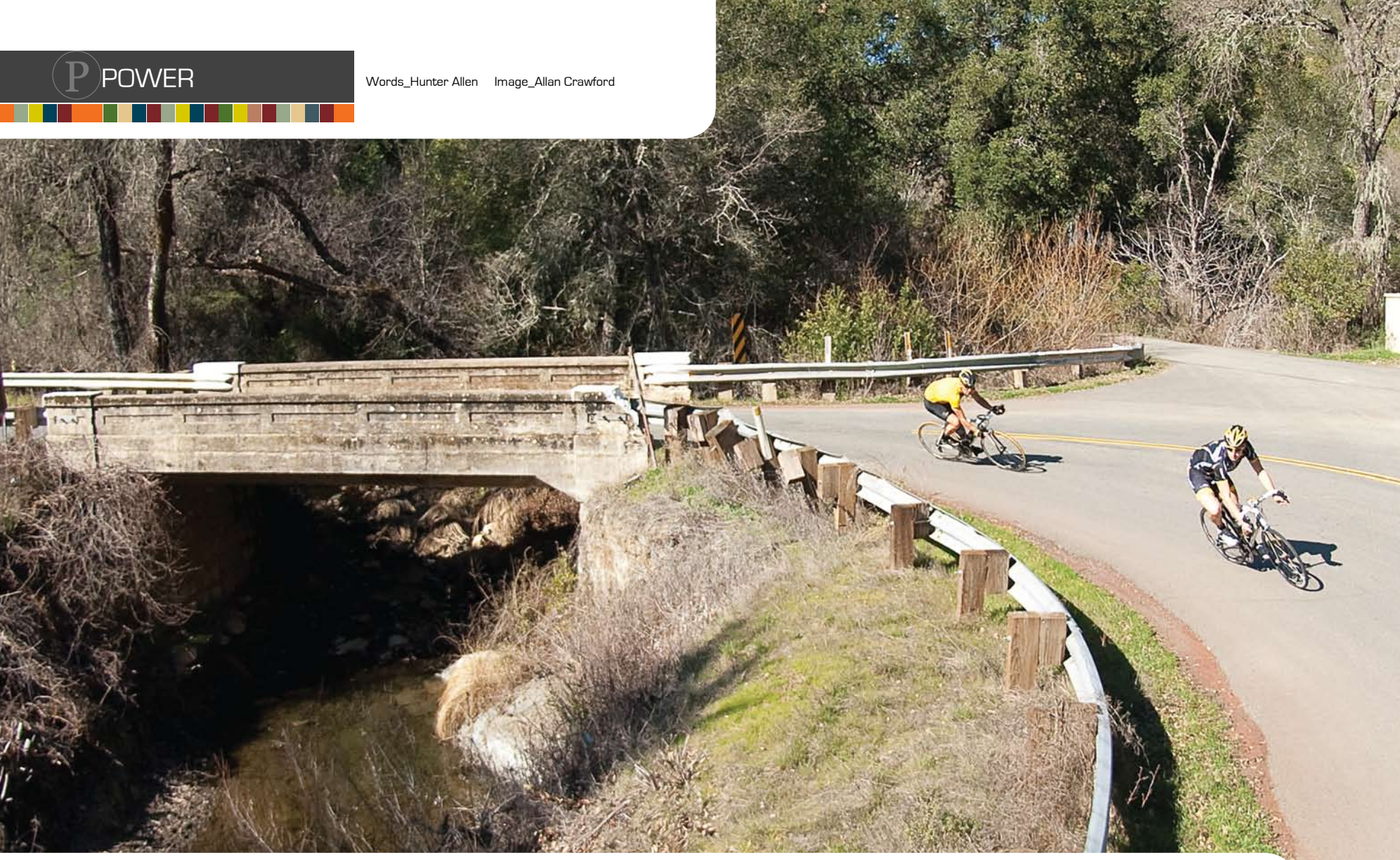

powerful IS IN THE PREP

Now that winter training is over and you have finished your cross-training exercises, and back on the bike training outdoors, there's always those questions in the back of your mind...

WHEN EXACTLY SHOULD I START TO WORK ON MY RACE specific intervals and prepare for those upcoming April and May races? Should I do sprints now? What about hill repeats or short one minute intervals? When should I begin those? These questions are asked by many cyclists in the spring, not just you, as they are legitimate questions and concerns. If you start your super high intensity too soon, you could risk bringing on your peak of fitness too soon, but if you wait too long, then you won't be ready for those great races in the spring. How long does it take for your body to adapt to a new training focus is the real question you should be asking of yourself and if you know the answer to that, then it will be easier to determine when exactly the sprint workouts should begin.

Before you begin a new phase of training emphasis, you always have to review your goals first. The goals that you have for the year are the driving force in ultimately determining the types of training you do and when you do them. The secondary consideration is the amount of work you'll need training a specific area in order to receive a training adaptation (improvement). That work load then determines how much time you will need to dedicate to achieve the desired training response. How can training with a power meter help you? Well, in reviewing your goals...not too much. You can use your power meter data to make sure you are on track to reach your goals. For example, you might have a goal of 4.5 watts per kilogram (w/kg) at your functional threshold power (FTP) by April 1, and if in your most recent test on March 1, you cracked out a 4.3 w/kg, then you would know you are on track. Otherwise, goal setting, review and revision is best left up to your most important asset in cycling, your brain.

The volume and intensity of training that you need in order to create a specific adaptation can be figured out though with help from your power meter data. The first thing you need to do is to go back and review your data from the previous year or if you don't have that much data, go back as far as you can, and then note when you see fitness changes. You are looking for significant improvements in your fitness in a minimum of four different training zones: Level 7– Neuromuscular Power (NP), Level 6– Anaerobic Capacity (AC), Level 5– VO_2 max (VO_2) and Level 4– Lactate threshold (LT). While Level 3– Tempo, Level 2– endurance and Level 1– recovery, are important for success as well, the Levels 4-7 incorporate high intensity work, which are critical for your racing. These four important intensity levels relate to specific time periods and those can be easily tracked in your TrainingPeaks WKO+ software using the Mean Maximal Power Chart. These time periods are 5 seconds (NP), 1 minute (AC), 5 minutes (VO_2), and 20 minutes (LT). Since your power meter records all of your rides, you have a plethora of data at your disposal for analysis and we are going to look for a baseline of your best average

watts in these times ranges and then look for significant improvements in each time period and note the time it took you to make those improvements.

In Figure 1, you can see how this athlete has improved over time in each of these four training zones and gives him a very good idea of the time that it takes to achieve improvement. For this athlete's 20 minute power or lactate threshold system to improve from 366 watts on February 19 to 379 watts on April 1, it takes approximately six weeks of focused training. For it to improve from 379 watts to a season high of 404 watts on May 18, it takes another six weeks of hard training. When we examine his VO_2 Max or five minute power, we see that it was 423 watts on March 23 and then improves to 468 on June 1, which is roughly nine weeks of training. By just looking at these two time periods and previous data, we are already learning some very important things about how this athlete responds to training stimulus. It appears that his lactate threshold responds pretty consistently in six week patterns, while his VO_2 max responds a little slower in about nine weeks. As we examine his mean maximal power chart even further, and look at his anaerobic capacity or one minute power we see that on March 16 his best one minute was 563 watts and then on May 11, he reached a season high of 684watts. This improvement took place over an eight week period of time in which he was consciously trying to improve his one minute power.

Finally, as we examine his neuromuscular power or peak five seconds, the first thing you notice is how it does not improve much at all for the entire year. Most of the year, it's stable between 1050 and 1100 watts, with a peak of 1294 watts occurring at road nationals when he responded to an attack from the winning breakaway. Since this one area didn't really show much change or improvement over the year, we have to be careful in making any conclusions about whether any of his training made a difference in this physiological zone. It's possible that this is just a natural weakness for him and no matter how much training time he might spend there, he may not improve. Another possibility is that a stronger sprint might not be a factor for the type of racing that he does and therefore it's not necessary for him to train it in order to succeed. Lastly, since his peak wattage occurred on one of the most important races (to him) of the year, it's possible that he just wasn't truly motivated to crack out one of his best sprint wattages in training.

Now that we know the relative time periods needed for significant improvements for this athlete, he or his coach can work backwards from his 2009 racing goals and decide when to begin specific training to create that peak of fitness. Understanding how long it takes for you to improve in one area or another is just one part of creating a fitness peak, managing the training work and rest periods are critical as well as deciding on the correct amount of training in each level. So, let's examine exactly how much time he spent in each training level to achieve those improvements by examining the power training zones distribution charts. One important point for you to understand is that the time spent in each of these charts is not consecutive time. If you spend four hours and fifty-eight minutes in the lactate threshold zone (Level 4), it means you spent 10 minutes

FIG. 1: Mean Maximal Power Chart.

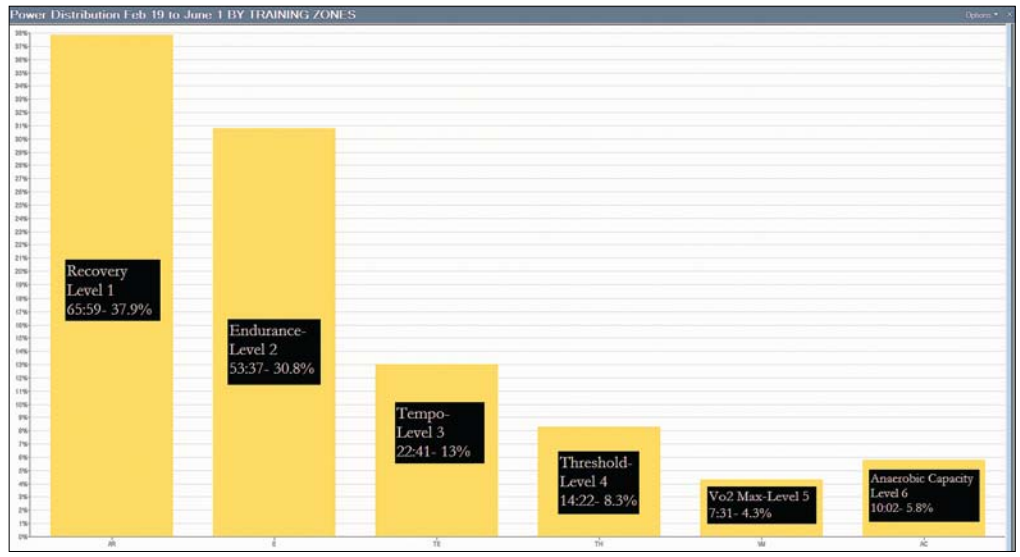

FIG. 2: Power Training Zones Distribution.

here, or 20 minutes there or 45 seconds over there, which all combine to add up to four hours and fifty-eight minutes total time. So, just be careful when you read these distribution charts as sometimes they can deceive you. Another critical factor is that you properly set your FTP for each time period as your FTP changes throughout the year. Since the power training zones are anchored around FTP, if you have incorrectly set your FTP, then the amount of time spent in each zone will be inaccurate.

In examining Figure 2 above, you can see how the training for this athlete was distributed over his entire available training time. The amount of time for Level 7 is combined in the Level 6 bar, as Level 7– neuromuscular power does not have a relationship with FTP, so any watts over 150% of FTP get lumped into the Level 6 bar. The percentages of time in each training level are individual to athletes, and 8.3% of the time spent in Level 4 for this athlete reaped large rewards, but that might not be the case for you. Complicating the issue as well is that fact that the energy systems in your body are a continuum and not some absolute discrete numbers at which one system turns off and another turns on. So, even training at Level 3 in tempo pace could give one athlete a very nice improvement at lactate threshold (Level 4), although not be reflected in the power training zones distribution chart. One interesting aspect in Figure 2 is that a larger percentage of time was spent in Level 6 than in Level 5. Remember that this athlete went from 563 watts to 684 watts in his one minute power? That was the biggest percentage improvement for all four training levels, nearly a 22% improvement, whereas the next biggest improvement came at the Level 4 zone, which was a 10% improvement. This could point to the fact that the athlete just had more room for improvement in this energy system, or it could point to the fact that there is a direct correlation between a greater volume of training stress in that Level 6 and greater improvement.

As you begin the early racing season this year, take a look back at the previous year's data to learn how much time it does take you to improve and in what areas. As you read in the example above, it's highly likely that you improve at different rates in each of your body's energy systems and knowing this can really make a difference in how you direct your training in the coming months. Your spring and summer goals determine which system is important to train more than another, and by understanding your body's response to the training stress, you will become a more powerful cyclist exactly when you want to be! [R]

HUNTER ALLEN has online training programs available at TrainingPeaks.com/hunter and has just recently started a monthly webinar series for athletes and coaches. Each month he will teach key parts of power training along with giving other tips for improving your cycling. Check out PeaksCoachingGroup.com for more information on his monthly webinar series. Hunter is the co-author of Training and Racing with a Power Meter, co-developer of CyclingPeaks Software, and is the CEO and Founder of the Peaks Coaching Group. He specializes in coaching cyclists with wattage meters. Contact Hunter directly at PeaksCoachingGroup.com.