

'Once Upon A Time

By William Fink

The Beginnings



1965. Leroy "Bud" Getchell working with two members of the Adult Physical Fitness group. Bud conceived the idea and gained the approval of BSU administration to establish a Human Performance Laboratory.

Once upon a time, a long, long time ago, sometime after Harvey discovered the circulation of blood, or maybe it was after Lavoisier discovered oxygen (I'm not sure), Leroy "Bud" Getchell returned to Ball State after obtaining his doctorate from the University of Illinois, having sat at the feet of one T. K. Cureton. "We need to start an exercise physiology lab," he said, with stethoscope and Heartometer in hand. And so he did. That was 1965. He bought a Monarck ergometer, much to the dismay of the University, who thought that \$500 was quite a lot of money for a bicycle without wheels.

Now Bud was busy about many things. He was enlisting men in a noon fitness jogging program, and selling them Tiger running shoes to boot. He was teaching his share of classes, trying to fund a couple hundred hobbies, AND he was coaching the Ball State basketball team. So, he said, not yet having his priorities in order, "We need to hire someone to run this exercise physiology lab." And so they did. And that was 1966. They had a choice between a young, talented researcher and scholar or David L. Costill, who barely made it through college. They hired Costill, and that was the beginning of the Human Performance Laboratory. And that brings us to this first picture. As it turned out, Costill was a man driven. He had one heck of a work ethic, putting in twelve and sixteen hour days; and he had one heck of a wife

(blessed be she) who would put up with this. This first picture shows the lab at its bare minimum, a bike, a Tissot, some telemetry and a Spec 20. In the second picture, we see The Human Performance Lab a few years later. This is the original 20 x 30 foot room off the back of the Gym floor, sandwiched between a classroom and a storage area. Seen here, it already shows the results of a lot of hard work. With \$4000 of start-up money, Costill was able to buy a Quinton treadmill. And with an NIH grant to study the effects of exercise on patients with heart disease, and a Royal Crown Cola grant to study dehydration and fluid replacement, he was able to furnish the lab with gas analyzers, a spectrophotometer, a small chemistry space, and to hire these two guys,

Craig Turner and Ken Sparks, to help him with the testing and analyses. This is the lab that saw the testing of Derek Clayton, Ted Corbitt, Amby Burfoot, and a lot of other notable distance runners of that time, and it produced several publications on the energetics of marathon running.

The lab was a small but busy place. A lot of time was spent screening and training men with heart disease. This went on for three years, and early in that period, two of Costill's major helpers, Dr. Walter Kammer and Dr. Larry McClements, tragically died, leaving Costill shorthanded with a lot of work to do. At the same time, the Lab was busy testing distance runners of all sorts and looking at the effects of dehydration and fluid replacement. It was also the time that Costill discovered the muscle biopsy and glycogen. Well, he didn't actually discover them, but he



(L to R) Warren Palmer (1st HPL Graduate Student) Ken Sparks (1st HPL Technician) and Dr. David Costill (1st Director of HPL)



1969-72 After the deaths of both Dr. Kammer and Dr. McClements, studies on coronary artery disease imaging men continued with the help of Dr. George Branam, Ken Sparks, and Dr. Jack Moore (r-l).

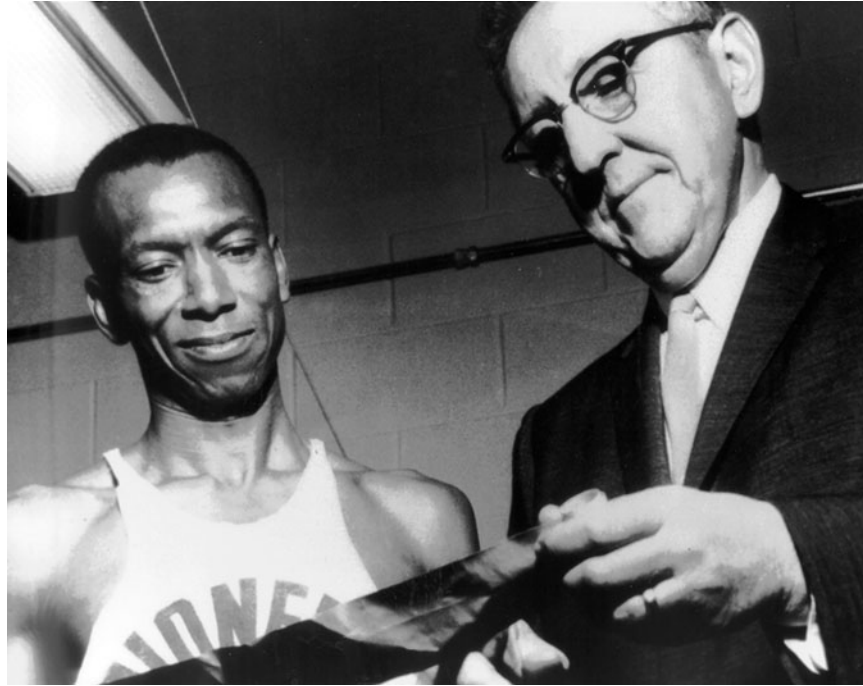
learned how to do them, and that set him off on a long series of studies looking at various aspects of nutrition, exercise, and glycogen usage. One of the first was a study of three successive days of ten mile runs on glycogen levels, and those who were subjects in that study will hardly forget those three days of hot summer running, topped off with biopsies before and after each run. Some of those hardy men are posing by the treadmill in picture #11. The study showed in no uncertain terms that, after three days of hard work with only one's usual rest and nutrition, muscle glycogen does not recover. This opened the door to a lot of studies on various types and quantities of carbohydrate feedings, and on various modes, intensities, and durations of exercise on glycogen levels and performance. But almost all of this work was done in the new Lab.



1970. Subjects and co-authors with Dr. Costill in the study of changes in muscle glycogen during 10 days of exhaustive running. This was the first time that muscle biopsies were employed in our laboratory. (l-r) Bob Gregor, Craig Turner, Ken Sparks, Paul Thompson, and Dick Bowers.



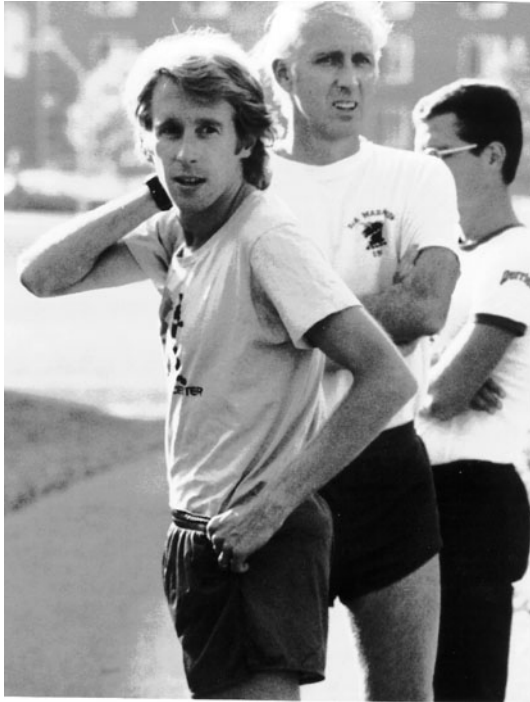
1968 Dr. Walter Kammer (center) was instrumental in studies done at the 1968 Olympic Marathon Trials and initiated an NIH supported study on coronary artery disease in aging men. Pictured are Tom Rogan (graduate student), Dr. Tom Woodall (second left) and Dr. Costill (running on treadmill).



Dr. Walt Kammer talks with ultra-marathon runner Ted Corbitt. Walt was instrumental in studies done at the 1968 Olympic Marathon Trials and initiated an NIH supported study on coronary artery disease in aging men.



1975. A record number of muscle biopsies were taken during a study with U.S. and Canadian track athletes. Eighty-three biopsies were taken in one day by Bengt Saltin and Save Costill during a trip to Dallas and Phoenix. Among the subjects studied was Frank Shorter (1972 Olympic Marathon Champion) and Steve Prefontaine (multiple national record distance runner). Shown here is a microscopic view of Frank's muscle, which was composed of 77% slow twitch (type I) fibers.



1976 and 1980 The Human Performance Laboratory was used as the setting for two one hour television programs for PBS (NOVA) and ABC (20/20). The subjects of the documentaries were Alberto Salazar (right), winner of the 1980 New York Marathon , and Bill Rodgers (left), five time winner of the Boston Marathon, shown with Dr. Costill



1968- 1985. A wide variety of studies on dehydration and fluid intake during exercise (running and cycling) were conducted. One of the subjects often recruited for these studies was Hal Higdon, a world famous writer and marathon runner. An early volunteer assistant in the lab was Gale Gehlsen (right).



This picture shows the HPL expansion. In 1972, Costill spent some sabbatical time in Sweden with Bengt Saltin, where he shared a desk with Phil Gollnick (Dave [Felix] and Phil [Oscar], the odd couple). He got all sorts of new ideas of where to go with muscle biopsies, and brought them back to a brand new Lab. In 1973, the University, with the help of some private donations, put up a metal building to the north of the Field Sports Building and close to Cardinal Creek as it wound its way toward the Duck Pond. We had our own little

parking lot, and nobody knew we were there. What a blessing! The building contained a sizeable treadmill room, a biochemistry lab, an environmental chamber (both hot and cold), prep rooms, and faculty offices. Bud Getchell was back in the Lab by this time with a very active Adult Physical Fitness Program. The lab saw a lot of treadmill testing, EKG's, VO_2 's, lactates, and blood lipids. It also saw a lot of other research continuing to look at dehydration, fluid replacement, athletic drinks, glycogen and lipid metabolism, muscle pH, and diabetes. So much was going on that within a year the Lab tore out one of the faculty offices, put in a little hallway, and connected two classroom trailers to the north side of the new lab. These provided room for some Cybex and strength equipment, student carrels, a classroom, a darkroom, some needed storage space, a locker room, AND what would become known as "The Swamp," the notorious hangout of our future doctoral students.

Nineteen seventy-three also brought Bill Fink onto the scene. Now here was a piece of work! Ex-theologian. Ex-English teacher. He first came to Costill's attention as a subject with good veins, but Costill soon realized that somebody had to take care of him or he was destined for the Muncie Mission shelter for the homeless. So he hired him on as a lab tech and carried him for the next 25 years until his retirement in 1998, and then he still would not go away. He is presently ensconced in the "assisted living" part of the Lab, an on-going study in aging.



In the summer of 1974, Costill sent Fink to Phil Gollnick's lab to learn how to do fiber typing and measure muscle enzymes and metabolites--a crash course in Oliver Lowry's *A Flexible System of Enzymatic Analysis*. In the fall of

that year, Bengt Saltin spent a few months in the Lab as a visiting scholar, and early in 1975 we all participated in the comprehensive study of elite distance runners that came together in Dallas, Texas. This Lab was in charge of the muscle biopsy data: fiber types and muscle enzymes. That weekend of research resulted in the biopsies in just two days, our Lab record. The results of this extensive study together with other similar studies of exercise were presented in New York in 1976 in a symposium on *The Marathon*, sponsored by the New York Academy of Sciences. This was the decade of the "running boom." Some would say it started when Frank Shorter won the Olympic marathon in Munich in 1972. Road races were springing up all over the country, and *Runner's World* was the runners' guru. This Lab was busy with lots of related studies characterizing athletes of various track and field events, nutrition, glycogen usage, athletic drinks, gastric emptying, dehydration and fluid balance, ergogenic aids, and much more along these lines that would affect athletic performance. For a few years *Runner's World* marketed an athletic drink we formulated called "Body Punch." We even started a little controversy over the effects of caffeine on distance running that kept other labs busy with similar studies for the next 10 years. (Things come full circle. I notice that *Runner's World* started off 2002 with an article on, yes, the effects of caffeine on distance running performance. And, yes, it does work.)

Trial and error was often the method used for a lot of our research, and there are some things we will never do again. How do you spare glycogen? How do you increase lipid metabolism? A heparin injection might do it, but that's impractical. How about fat feedings? Costill found out pretty quick that you can't drink a cup of corn oil. How about free fatty acids? Besides their sickening smell of crayons, we found out, also pretty quick, that they are, indeed, acids, and they can't be camouflaged in peanut butter! Better stick to good training. (And maybe a cup of coffee.)

Most of the work of these years was done with very few graduate students in the Lab, but as Costill published more of his research (he had 95 publications in the '70s), and gave more and more talks at conferences and road races (he gave 60 talks in one year, about two a week for much of the year somewhere in the world), our Lab began to attract many more students. Sometimes it felt like most of them came here to train--even Fink managed to run 24 marathons before he fell apart--but a lot of work got done, and most of that by hand, because this was a time before the advent of the computer that can now do in minutes what used to take days.

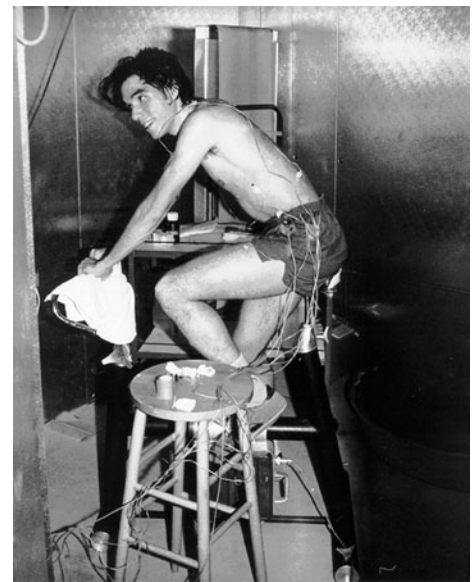
These pictures feature the successful outcome of a bet Costill made with the Bike-a-thon team of the Sigma Phi Epsilon fraternity. He bet Ed Burke that he could produce a winning team if he would be allowed to train them. Ed took him up on that and delivered his



fraternity's bike team. The Lab basically made sure that they included enough high intensity sprint work on the ergometer each week, and, come May, they did win the 80-mile race around the oval at the local fair grounds by about half a mile. It's still in dispute whether the training did it, or whether Tom Doughty did it single handedly.

The decade of the '70s ended with the publication of *A Scientific Approach to Distance Running*, a summary of much of the work done in the Lab over the previous 15 years. This was an updated revision of an earlier monograph, *What Research Tells the Coach about Distance Running*. As we look ahead to the 1980s, this would be revised again as *Inside Running* (1986), and it is presently being revised again for, hopefully, an early future publication. It looks like it will be called *Distance Running: The Athlete Within*.

Bud Getchell was also very busy. In 1976 he published the first edition of his book, *Physical Fitness: A Way of Life*. Since then it has gone through several editions and has proved to be a very popular book. Over the years, Bud was able to use the royalties from the book to build a mansion for himself on a lake in northern Michigan and to fund those couple hundred hobbies of his. Costill celebrated his with a pizza.



A young Eddy Coyle all wired up for one of many trials in the environmental chamber.



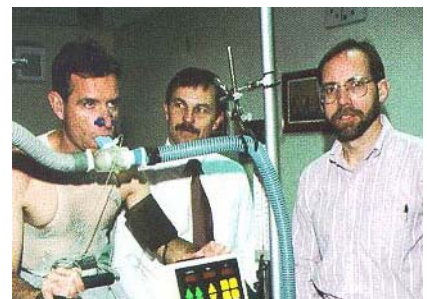
The HPL building in the late 70's. The Quonset hut shown on the right edge of the picture collapsed during a snowstorm in 1979.

There never seems to be enough room for all the things you need to do. In 1980, the University built a new extension to the Lab, but not without a lot of difficulty getting it within budget during a time when interest rates were over 20%, and rising, it seemed, every day. But it was done. The new addition extended out to the West toward McKinley Ave. A small hallway broke through what was Costill's office to connect to the new building. The "front" door was now opposite the West End of the Field Sports Building and opened onto a nice reception area and conference room. Besides a row of faculty offices, the building included exercise testing and prep rooms, a strength equipment and Cybex room, a much enlarged biochemistry laboratory, a tech room, and lockers. The old

biochemistry room was turned into a classroom, and Bud Getchell took over the old treadmill room for his Adult Fitness program. The whole Lab by this time looked something like a labyrinth. It was protected by a security system that was activated with a key inside the "back" door of the Lab. Should anyone come in without turning it off and open any of the inner doors in the Lab, an alarm would go off at the campus police station and we would very quickly receive a visit from one of the police. We had lots of visits. Should this happen at night, Costill would get a call, "Do you know anyone by the name of such-and-such who says he's a student in your Lab?" One of those students, Phil Bogle, can testify that Costill sometimes would say, "No."

Bud Getchell's Adult Fitness Program grew and prospered from the mid '70s to the mid '80s. In 1985, Bud set his sights on higher things and accepted an offer to establish the National Institute for Fitness and Sport (NIFS) in Indianapolis. After some years of trying to make a go of that, he moved on to Indiana University in Bloomington until his retirement to that mansion in northern Michigan a few years ago. Bud is still very active, but with, perhaps, something a little less than those two hundred hobbies.

Mitch Whaley, one of Bud's former students, took over the Adult Fitness Program in 1986, and Lenny Kaminsky joined him in 1988. The two of them would lead the program until the end of 1998. The program is now under the direction of Dr. Cathryn Dooley, Josh Dobbs, and Tonya Skalon. Bruce Craig joined the faculty in 1981 to replace Pete VanHandel (now deceased), who moved on to the Olympic training center in Colorado. Other notables who joined the staff in the '80s were Dave Pearson, whom Costill dragged back to finish his Ph.D., "Big Al" Holdren, an enterprising jack of all trades, and Gary Lee, who replaced him as Lab technology



Jim Ross, Lenny Kaminsky, and Mitch Whaley

expert, computer programmer, and fix-it man. "Ga-a-ary," the most often heard name in the Lab. It means "Help!" And, of course, Jo Hains, Costill's faithful secretary from the mid '70s to her retirement in 1998.

In 1980, the State of Indiana approved a doctoral Ph.D. program in Human Bioenergetics to be housed in the HPL. Our first official students were Rick Sharp and Larry Armstrong, who received their degrees in 1983, but we claim Bill Evans as our first first, in 1980, who went through the HPL program but was awarded his degree out of Biology. To this point we have graduated 30 Ph.D. recipients from the Lab, and hopefully another two in 2002. And I don't want to even count the number of masters degree students we have had along the way.

I might add at this juncture that I have tried hard NOT to mention very many students by name. This is not because I want to slight any of you, but because there is no way that I couldn't overlook almost all of you. Those I do name are usually named because they happen to be in a picture that has survived to the present day and illustrates something going on in the Lab at the time. We hope to add other files on this HPL web site that will contain your class pictures and other photos that can take you down memory lane.

The 1980s were a very busy and productive time in the Lab. Counting some columns in *The Runner* magazine and some papers delivered at conferences of various sorts, Costill and his students published some 185 manuscripts during this decade, and most of those in peer reviewed journals. Much of our research was a continuation of what we were doing from the start. We were still testing some of the elite distance runners of the time. Boston Marathon winner Bill Rodgers and New York Marathon winner Alberto Salazar visited the Lab for some testing. Costill used the occasion of Bill Rodgers' visit to fake some pictures of a race showing him edging out Bill at the tape. It provided some comic relief during some of his many speaking appearances both here and abroad during these years. (Not that his talks needed comic relief, of course!) We also tested a number of the elite women distance runners at that time as part of a comprehensive study sponsored by Coca Cola and done at Georgia Tech. This was designed to be the follow-up to the 1975 study of elite male distance runners that was done in Dallas.

It was about this time that Costill's running career fell apart, much like Fink's (he could never beat Fink in a marathon anyway), and he went back to his first love, swimming. This began a series of studies using the Ball State swim team as subjects. We looked at swim strength and power, training, overtraining and detraining, muscle fiber type and glycogen, tapering and performance. You name it, we did it. Much of this eventuated (1992) in a book on swimming co-authored with Ernie Maglischo and Allen Richardson, simply entitled *Swimming*.

Quite a few other things were also going on. At different times we were doing work for Coke Foods, Pepsi, Kraft, Abbott Labs, and others either testing products or trying to design the perfect athletic drink. Somehow or other it seemed like glucose polymers were discovered about this time, making it possible to create a drink with lower



osmolality that would provide more carbohydrate. Lots of mixing. Lots of testing. Lots of gastric emptying. I think we were emptying stomachs for 20 years. Some stomachs would empty quite well; others would give you back more than you put in. I could name names, but I won't. You know who you are. Here is a picture, however, of Joe Houmard and Joel Mitchell.

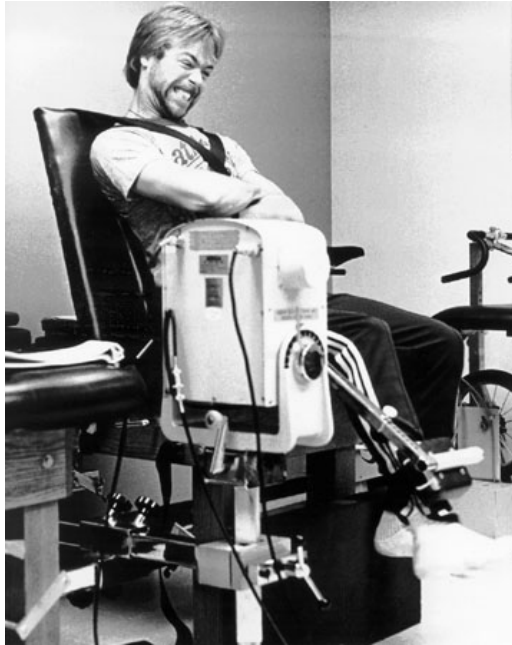
There are a few things we will never do again. A rather sophisticated, but bloody, study of leg muscle metabolism and blood flow is one of them. On a more ridiculous level, there was the choline feeding study by way of a lecithin milkshake. Not good! Amazing gastrointestinal effects!

Speaking of which, the 1980s saw a series of bicarbonate studies. A lot of interest was generated in acid-base balance in muscle and blood, and the effects of an alkalinizing drink on anaerobic performance. Miles Laboratories got us started on this, but it ended up with something more than a couple of Alka Seltzers, more like 20 grams of sodium bicarbonate. Scientifically, it was an interesting look at the relationships of pH and lactate in the different compartments of muscle and blood. Practically, we showed that the bicarbonate feeding did work in certain special circumstances, like for the last of repeated fast intervals in swimming. This was another one of those things that kept other labs busy for most of the decade.



1986- John Beltz as a subject in yet another gastric emptying study.

Then there was a series of studies done in collaboration with Steve Coburn of the Fort Wayne Developmental Center. Steve Coburn was the Vitamin B₆ expert, and he enlisted our help in looking at Vitamin B₆ content in muscle, the largest compartment for it in the body. He also wanted to see the time course for Vitamin B₆ depletion if subjects were put on a very strange diet, indeed. There was a lot of muscle, blood, and, especially, urine samples floating around the Lab for several weeks. There are some stories here that I will leave to your imagination.



Okay, here's a picture of Brian McKay doing some heavy stuff on the Cybex. The Cybex was never far removed from a lot of studies going on in the Lab.

A few of the other things the 1980s brought would include, perhaps first of all, the computer. Our first computer was a Radio Shack TRS-80. Then there were a number of Apple II's, and then Macs, and finally a bit of everything. All of these, in a very short time, became "boat anchors," as Gary Lee would call them. This was the era of the Rayfield system for doing treadmill VO_2 's, and then finally Microsoft Word, Excel, and Power Point. In the biochemistry lab, we got our first primitive HPLC to measure catecholamine levels in Costill. It was a simple pump with an EC detector and chart recorder. It was very sensitive to vibrations of any sort, so we had to string up a "line of death" around

it that no one dare cross. Then there were always glycogens. Fink still brags that he has probably done more glycogens on human muscle than anyone else in the world. Of course, this number seems to grow exponentially every year in much the same manner as the number of biopsies Costill says he has done (or Ed Burke says he has had).

We cannot leave the previous 20 years without mentioning "The Hands Costill Award," a plaque given out whenever appropriate for monumental blunders committed in the Lab. There have been some memorable winners. Unfortunately, there were more blunders than there was room on the plaque, so I would hate to leave anyone out were I to name names. You know who you are. Suffice it to say that indelible oil red stains all over the wall and floor are now gone since the old lab was torn down; so too are the scars from trying to burn down the lab two nights in a row; oxygen analyzer parts thrown out in the dumpster were for an instrument no longer made; and self-inflicted wounds do heal.

In 1989, the University was hot to build a nice, new, wonderful, 12,000 seat basketball arena (now called Worthen Arena) that would be connected to the rest of the whole athletic and physical education complex. (Well, it's actually called the Health and Physical Activities Building, the HPAB for short.) The problem was that the arena would sit right on top of our Lab. The University originally wanted to just pack us up and park us someplace for a year, but Costill convinced them that pending



doctoral and masters degrees required a functioning laboratory. So the decision was made to finish the new Human Performance Lab part of the HPAB before going on with the basketball arena. By this time a new Field Sports Building had been erected--did I forget to mention that the old Quonset hut collapsed in an ice storm?--and a two-story wing with athletic offices in-the-making connected to it, but it stopped abruptly right at our front door.



Here are a few pictures showing something of the trashing of the old Lab and the building of the new. Here is a memorable picture of our doctoral students who made the transition at that time--Roberts, Pascoe, and Zachwieja. They stand in front of the bulldozed trailers. (Farewell to the Swamp!) It did not take long to knock the whole thing down. The rest of the pictures are a sequence showing the groundbreaking, the rising

skeleton of the new wing, and the finished product. We moved into the new Lab in February of 1990. It was still a very dusty place because construction was still going on above us in the Biomechanics Lab and the Wellness Institute, as well as right outside our back doors.



The new Lab was a wing of the HPAB unto itself, with its entrance on McKinley Ave. The front doors opened onto a nice reception area, with a conference room off to one side and the Adult Fitness office off to the other. The lab itself was secured behind closed doors (if we could ever keep the ---- students from propping them open), and consisted of two long corridors with testing and biochemistry laboratories in between. The north corridor contained Adult Fitness offices, two student carrel rooms, a kitchen, a catch-all room which is now a molecular biochemistry lab, and a storage room. The south

corridor consisted mainly of faculty offices, Gary's shop, and two rooms that have been several different things over the past ten years. One is the single fiber testing lab and the other is an imaging lab. The Cybex equipment has been moved to a room upstairs. The middle section between the two corridors contains the Adult Fitness testing lab, lavatories and lockers, the exercise treadmill lab with prep room and environmental chamber, and the biochemistry laboratories.

Research goes on. The '90s started with more work with resistance training and glycogen usage, or with carbohydrate feedings and the rate of glycogen synthesis. We were still looking at the effects on glycogen of various types and timing of exercise and feedings. But other things were in the wind. We started looking at the effects of feedings on muscle triglycerides, providing Fink with a rare moment of creativity in finding an easy way to measure it. Early on we brought back to the Lab a number of the elite distance runners that we tested in the '70s. This now became the aging runner study. It included much of the same testing that was done 20 years before, but added some newer technology such as CAT scans of leg muscle and DEXA scans for bone density and body composition.

Nineteen ninety also brought us Tony Mahon and a new direction in research that the Lab had not seen before. Tony's specialty is pediatric exercise physiology, and now young boys and girls were seen running on our treadmill and giving blood. We've all heard those shouts of encouragement when someone's doing a max VO_2 ; Tony cheering on a very young kid gives new meaning to that word.

Product testing. Is there no end to it? We pretty much got away from trying to create the perfect athletic drink, and the gastric emptying that usually went along with it, but there's always that secret ingredient that's supposed to lift one up to the next level of winning performance. We tested carnitine, quite a bit of carnitine, but could never show that it did anything except loosen the bowels, although it did allow Fink with another moment of creativity in coming up with a method for measuring it. The list goes on. There was Coenzyme Q₁₀, HMB, caffeine, different kinds of starch, carbohydrate plus protein, inosine, ribose, bagels, gelatin, Vitamin E, and lately lots of creatine. And there were probably a few other things that snuck in there while I wasn't looking. Not major research, but these things are always useful for providing thesis projects.



Liftoff of STS-78 June 20 1996



Bob Fitts (our co-principal investigator from Marquette University), Todd Trappe, and Costill on the scene in Houston.

And then there was NASA. Then there is NASA. It keeps going on. It started in the mid '90s with ground-based preparations for STS-78, a shuttle flight that finally lifted off on June 20, 1996. Our job was to study the effects of microgravity on muscle. Costill, Gary, and Trappe (O yes, the Trappe brothers were here by this time) had to learn a lot of new acronyms--the place was buzzing with them--, and one of our jobs was to create one of them, a torque-velocity-dynamometer. It was TVD this, and TVD that. There were numerous trips to Houston, and even to Switzerland, trying to interface with NASA and the powers that be. There was a bed rest study in California and various other "counter measure" studies with unilateral leg suspension (ULLS) here in the Lab. But then the work begins. We've got astronaut muscle before and after the flight, plus strength and training and VO_2 data to crunch. By this time, the Lab has gone beyond the usual muscle enzymes and fiber types and is into single fiber measurements. Lots of gel electrophoresis. Lots of single fiber physiology. Scott Trappe learned this from Bob Fitts and brought it back to the Lab, and that started us on other research looking at the effect of taper on single fiber physiology in swimmers, as well as in young and old, male and female, this way trained and that way trained. It's also creating a few very nervous, blind and shaky doctoral students.



1993- Scott Trappe doing a VO_2 max test at JSC in the shuttle Spacelab module.

Now Bruce Craig's doctoral students aren't as blind and shaky, but they are just as nervous. Bruce is continuing many years of research into glucose transport

mechanisms, using both rats and humans, as well as an occasional venture into other hormones. He is also the official "user" of any radioactive material in the Lab, and you better pay attention to his rules.

We cannot overlook the Adult Physical Fitness Program housed in the north corridor of the Lab. Under the co-directorship of Mitch and Lenny, the program grew and prospered through the '90s, and quite a few students were trained in fitness testing and cardiac rehab. The screening of older men and women, started way back with Bud Getchell, continued year in and year out, plus supervised training in a new APFP exercise room in Irving Gym. For a couple of years, the Lab was one of the sites of the practicum examination for ACSM certification. Volunteers from the program would be the patients. Fink would win the prize for best acting as a COPD pink puffer. The APFP is now under the direction of Dr. Cathryn Dooly, but the testing goes on. The program has the newest VO_2 equipment in the Lab and just about any method you can imagine for measuring body composition.

After Costill and Fink retired in 1998, the University hired Dr. William Kraemer from Penn State to be the new director of the Lab. Bill brought with him a few students and Jeff Volek, who was hired on as an assistant professor a year later. Early in 1999, he also hired Bozena Jemiolo, a real biochemist, to fill Fink's slot in the Lab. Kraemer came with a lot of energy and used much of his start-up money to buy some new equipment for the Lab. Bozena was furnishing a whole new molecular biology laboratory, where she is now looking at RNA and such stuff. A few new deep freezers quickly appeared, and that fascinating body imaging machine called the DEXA. Bill seemed to be collaborating with everybody almost everywhere in the world, while those deep freezers he bought very quickly filled up with blood samples from various studies. Jeff Volek was soon engaged in a large Atkins Diet study, trying to convince his subjects that a very low carbohydrate diet isn't all that bad after all. How convincing he was is still up for grabs. And, yes, we were still doing creatines and carnitines in the Lab.

In 2001, Bill Kraemer and Jeff Volek left for Connecticut. Scott Trappe was appointed acting director of the Lab for two years until a permanent director can be found. Scott is a virtual clone of Costill--a scary thought--, and the Lab is hearing NASA things again, single fiber things again, swimming things again, and aging things again. And two of those aging things, Costill and Fink, are subjects in residence.