

# HUMAN POWER

Official IHPVA  Newsletter

ISSUE 3

Summer, 1979

## Personal Reflections on the Abbott Prize

(by Allan Abbott, M.D.)



*Triumph!*

*L. to R.: Allan and Kathy Abbott, D. Guichard, T. Brummer, C. Dreike, B. Stinton, and J. Russell*

In the summer of 1977 a small group of human powered vehicle enthusiasts met at the airport in Big Bear, California. At dawn we attempted to show that the 7000 foot altitude could provide a significant advantage, and to try to be the first to reach 50 mph. After 2 hours of frustrating attempts the weary crews retired to the nearest greasy spoon for breakfast.

As I had decided that this was to be my last HPV racing, it was a nostalgic time for me. At the breakfast table I sat across from Chet Kyle and casually suggested "Wouldn't it be nice if someone put up a prize for the first HPV to reach 55 mph, the national speed limit . . . sort of a mini-Kremer prize?" Chet replied, "Yeah, . . . gee that would be great, why don't you do it?"

Before I knew it, his words had gotten to me and I found myself setting up a \$2500 prize for the first HPV speed limit breaker. I spent weeks guessing with myself about how to set the rules: the winner would be the first multi to reach 55, or the first single to reach 54. At that time the 50 mph "barrier" seemed tough enough to break, so I decided that if 55 hadn't been beaten by 1985, the fastest before that date would get the prize. Now, just 2 years later with such good hindsight, my foresight was obviously poor. 55 mph has come, and

gone, much sooner than expected by many people. It now appears the next obvious target is 60 mph.

It seems unfortunate to me that such huge strides in the multiple category have left the singles behind in the dust. In two years the multiples have gone from 49 to 57 mph, while the singles have only raised their record from 49 to 50 mph. Perhaps the challenge of a new prize for 55 mph in a single would add a new spark of interest.

As I stood by the timers at Ontario on Saturday morning and watched White Lightning make its first run, I felt mixed emotions. When the 56 mph speed was announced I was pleased to see such a

high speed, but disappointed that the competition for 55 mph was so short lived. I was kidded about losing \$3000, but that didn't bother me - I knew that the money was spent when I set up the prize, two years before. I struggled most with the feeling that I had set the speed too low.

But today I am pleased. A goal was set, it was obtainable, and it was quickly reached.

My only regret now is that there is not more interest in the singles. A four man vehicle reaching 60 mph would be nice, but a single man reaching the 55 mph "barrier" . . . now that would really be something!

## BROKEN RECORDS DOMINATE 5th SPEED CHAMPIONSHIPS

(by Bill Wilkman)



*Jan Russell and Butch Stinton receive traffic "citation" from CHP Officer, R. Newton*

Ontario Motor Speedway was, this year, the scene of both numerous traffic citations and long awaited jubilation. Interestingly enough, however, the most jubilant of all were the cited themselves. The reason? The citations were strictly ceremonial; issued to honor the first purely human powered vehicles ever to break the national speed limit of 55 mph. The occasion was the Fifth International Human Powered Speed Championships, held by the IHPVA and sponsored by BIKE WORLD Magazine.

First to earn the coveted citation and, thus, winners of the \$3000 Abbott Prize, were Butch Stinton and Jan Russell who powered Northrup University's "White Lightning," to a speed of 55.85 mph over the 200 meter timing traps on the very first official run of the event. White Lightning was not the fastest machine at the competition, however. The highest speed of the day was recorded by a brand new supine triple driven by Leonard Nitz, Scott Andrews and Dave Grylls. Together, these three scorched to a 57.07 mph run late Sunday. Also earning a ceremonial speeding ticket was the Phil Norton/Tom Nysether tandem that topped out at 56.56 mph.

(con't on page 2)

## 200 Meters, Multiple Rider Vehicles

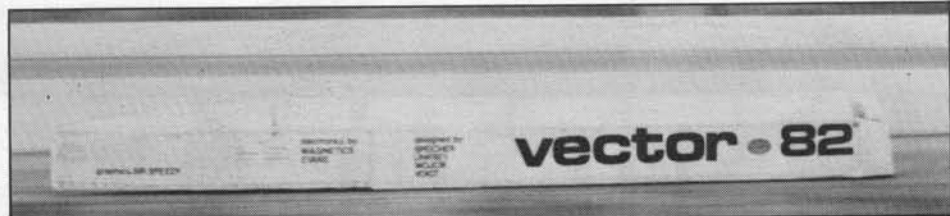
In keeping with a trend established some three years ago, multiple rider vehicles dominated the '79 competition in the 200 meter event. Only two single rider vehicles out of about 32 entered were able to approach the 50 mph mark. In the multiple rider category, on the other hand, four of the 10 or so machines broke 50 — each several times. Aside from the three over 55 mph machines, a new vehicle dubbed "Thurgood" built by Norm Ogle and piloted by Norm and his brother Charlie, topped the 50 mph mark with a final recording of 50.61 mph. Also in the ballpark was Tom Rightmyer's handsome aluminum monocoque tandem that reached 48.74 mph with Adam Speth and Glen Baldwin providing power.

The winning of the \$3000 Abbott Prize was the weekend's major accomplishment. First offered by Dr. Allan Abbott after his retirement from competition at the 1977 IHPSC, the prize was originally intended for single rider vehicles. Later it was changed to accommodate both single and multiples considerably broadening its chance of being captured. Singles were given a 1 mph handicap at 54 mph, while multiples had to achieve the full 55 mph. Despite the change it was Abbott's hope that it would be won by a single after several years of competition.

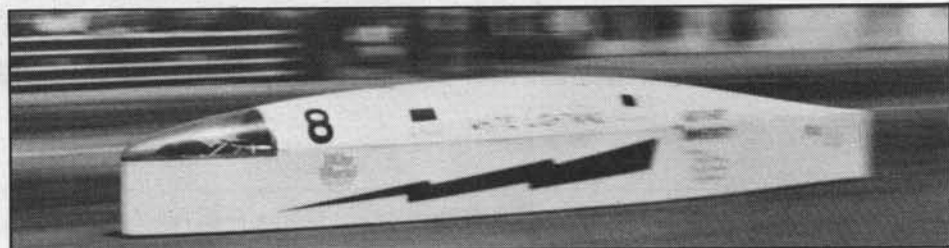
Perhaps due to the swiftness with which the prize was won, the feat was not greeted with overwhelming enthusiasm. It seemed that everyone was well aware that it would be accomplished; it was just a matter of when. Perhaps adding to the fait accompli atmosphere, first run of the event by special arrangement with the promoters, whereby the team agreed to wait until the '79 IHPSC to make an official run at the prize, rather than do it on their own. Also contributing to an almost blasé feeling was the fact that many believed that 55 mph had been broken at the '78 championships. At that time during an almost flawless run that saw White Lightning's speedometer hovering above 55, the track's timing mechanism failed, leaving the Stinton/Russell team without an official clocking. The news of the timing failure was greeted with disbelief, for the team was sure they had won the prize.

The official 55+ mph run of this year was made in the thick fog that plagued the hour record vehicles and was actually accomplished in a slight head wind. The pricewinning White Lightning vehicle of this year was basically the same supine tandem Tricycle run in 1978 with the addition of hand cranks for the stoker and covers for the wheels. These refinements plus the accumulated experience of the pilots put the Chris Dreike, Tim Brummer, Don Guichard creation over the top and into the money.

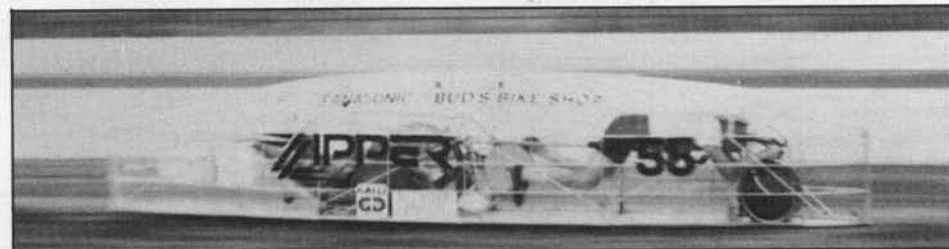
Stroker Butch Stinton commented after the Abbott Prize winning run, "I feel great; especially after we had to wait



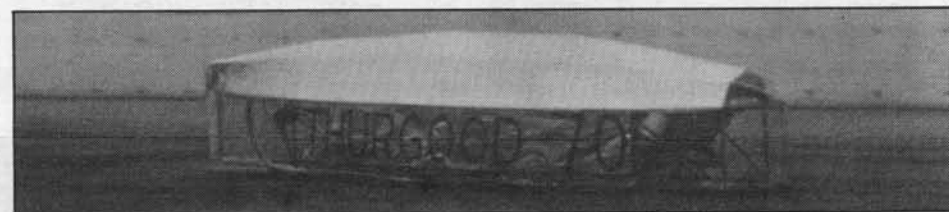
Grylls, Andrews, and Nitz power #82, "Vector" to 57.07 mph.



Abbott Prize Winner, "White Lightning" in action (56.92 mph)



Third 55 mph+ machine, Phil and Sue Norton's "Lightnin' Rod" (56.56 mph)



Norm Ogle's "Thurgood" — good for 50.61 mph.



Tom Rightmyer's beautiful aluminum monocoque (48.74 mph)

a year to get it." Pilot Jan Russell was ready for more. "I feel we can go faster," he said, "we were accelerating all the way through the traps." And faster they did go, posting a top speed of 56.92 mph by the event's end. The Abbott Prize will be split five ways among riders and builders.

Almost upstaging White Lightning was a three rider vehicle dubbed "Vector." Vector took first place over-all with speed of 57.67 mph. A product of General Dynamics engineers Al Voight, Steve Wojcik, John Speicher and Doug Unkrey, Vector was brand new to the IHPSC competition. Propelling the vehicle was a powerhouse trio consisting of pursuiter Dave Grylls, Scott Andrew and Leonard Nitz.

With a squat profile of just 25" in height and 22 feet in length, the triplex

was constructed of steel tubing covered by Kelvar plastic shell. All three riders assumed the prone position with the two rear riders pedaling with both feet and hands via handles attached to the pedals of the rider in front of them. A 195-inch gear was pushed by the riders. Vector rolled upon four 18" sew-up tires.

Nitz, the pilot, commented that "it handles perfectly . . . I had plans to ride a single, but then when I saw this machine I said forget the single; I said this is a good machine. I'm not going to waste my energy on anything else."

News that the Vector team had exceeded 57 mph and nudged out White Lightning for first place greeted the riders upon their return to the pits. The scene was pure jubilation. "We kicked it a little sooner," said Nitz, "because we discovered we were hitting top speed

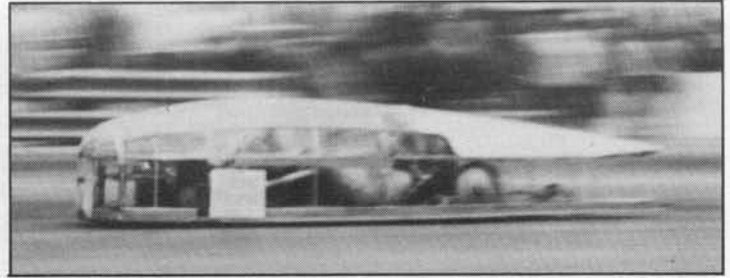




First single to break 50 — Martin/Dean machine powered by Fred Markham (50.84 mph)



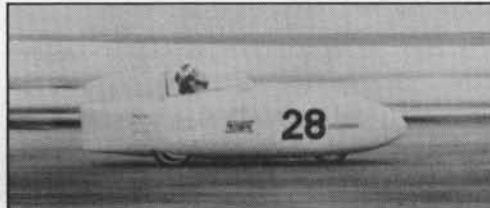
Paul Van Valkenburgh's hand and foot cranked vehicle (49.77 mph)



12-inch soap box derby wheels plus linear drive on Willmot White's "Loco-Motion"



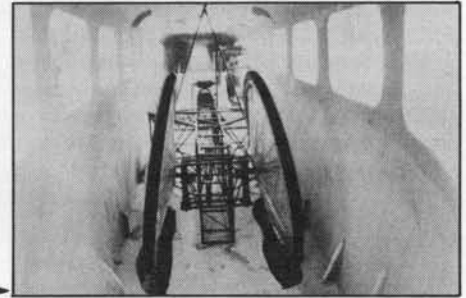
Peter Johnson's 4th place linear drive vehicle (44.74 mph)



▲ Alec Brooks' "Pressodyne II"

◀ Mario Eskabido on Steve Ball's vehicle

Inside Blanding/Rawdon's #58 ▶



right at the end of the run . . . it takes hardly anything to keep it rolling after you're up to speed."

Decked out in a clear mylar fairing, the Phil Norton/Tom Nysether vehicle was the third machine to exceed 55 mph. Like White Lightning, an official 55 mph had eluded them in '78 and they came prepared to correct this situation in '79. To accomplish this, changes were made to both the human and aerodynamic aspects of the vehicle.

To begin with, an alternate team was assembled consisting of Jeffrey Ash and Leigh Barczewski. With a silver medal in the World Tandem Sprint Championships, this team seemed the best bet for shoving the Norton Machine over the top. The familiarity of Nysether and Norton with the machine proved more important, however, as Ash and Barczewski could not top Norton and Nysether's runs. It also showed the importance of engineering over muscle power in the realms of streamlined vehicles. Ash and Barczewski only made runs on Saturday, however,

Aerodynamically, the vehicle was improved with a new laminar flow fairing. Made of clear Mylar instead of Dacron as used last year, the fairing was designed to operate under an entirely different aerodynamic principle than the old one. Rather than reducing frontal area to slice through the wind, the new fairing was designed to produce the effect of laminar, or "attached" air-flow, whereby a layer of

air remains on the skin of the fairing and serves as the surface over which the air being pierced, flows. Also altered was the gearing, up from 172" to 187".

#### 200 Meter, Single Rider Vehicles

Gardner Martin and Nathan Dean put five years of refinement plus Fred Markham to work to become the first machine to break 50 miles per hour (50.84 mph) through the 200 meter traps. In the process they nipped Therio/Van Valkenburgh out of first place by 1.07 mph, and broke the latter's two year grip on the single rider championship.

When the Martin/Dean vehicle first ran in the early years of IHPSC, it suffered badly from stability problems and was the victim of more than one crash. With greater experience, changes have been made, such that for the past two events it has earned a respectable place in the IHPSC competition. "One of the most critical improvements" said Martin at this year's event, "was learning how to make it handle." Ten major changes were made to the front end of the two-wheel prone vehicle before it was discovered that the rear wheel was in the wrong place. "We moved the rear wheel behind the crank — instant stability," said Martin. Guided by a 24" front wheel and powered by a 27" rear wheel, the machine stands 30" high and is 20 feet long.

A challenge on the 50.84 mph record by Ralph Therrio was abruptly ended

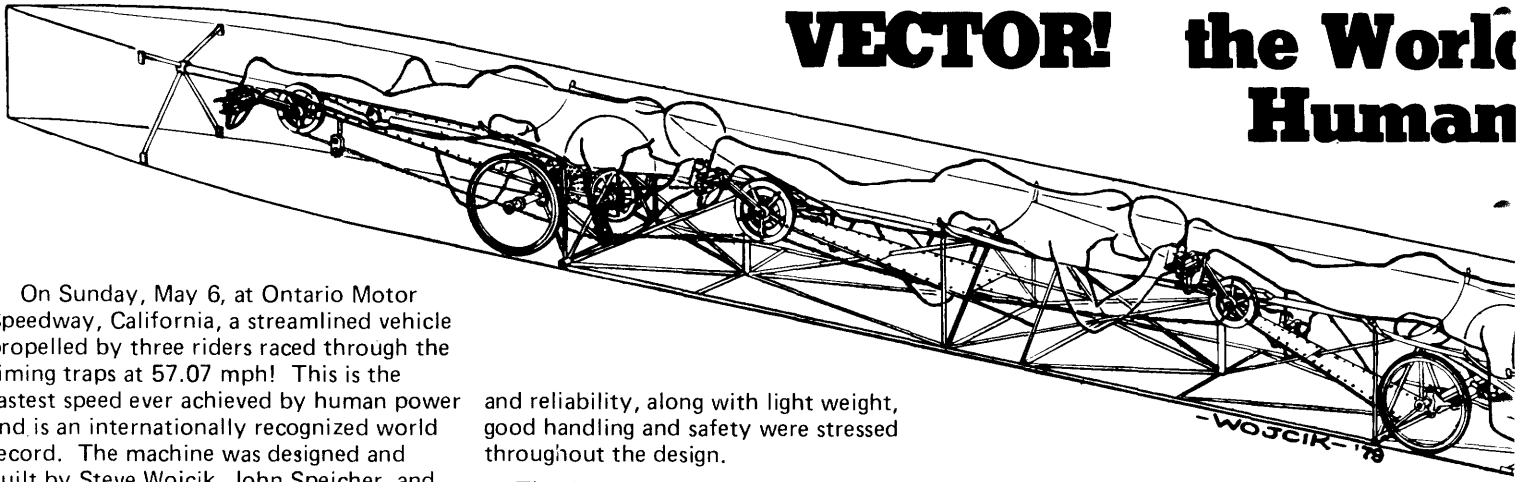
when he crashed into a camera tripod. Therrio had relaxed his grip on the hand and foot powered Van Valkenburgh creation and suddenly found himself off the course and headed toward the tripod. The result of the 45 to 50 mph impact was a damaged fairing, crushed front wheel and broken front end. The camera didn't fare much better. Therrio only sustained a bruised hip and chin.

While the Martin/Dean and Van Valkenburgh/Terrio vehicles were the only truly competitive single rider machines, innovations in this class were strongly present. Also evident was a much larger number of entrants: 29 singles listed in the program, to only 8 multiple rider machines.

Among the innovators were four linear-drive vehicles. One built by Steve Ball and ridden by Mario Eskabido was operated by a push-pull linear drive utilizing both hands and feet from the prone position. The three wheels on the machine were made of a honeycomb material with a thin bead of molded-in-place solid cast polyurethane tread for tires. Wrist motion at the front handles steered the vehicle. A cluster, chain and two toe clips were the only standard cycle parts. An additional entry in the hands-and-feet linear drive category was a vehicle built by Alex Brooks. Unfortunately, Brooks' vehicle snapped a cable during an early

(con't on page 7)

# VECTOR! the World Human



On Sunday, May 6, at Ontario Motor Speedway, California, a streamlined vehicle propelled by three riders raced through the timing traps at 57.07 mph! This is the fastest speed ever achieved by human power and is an internationally recognized world record. The machine was designed and built by Steve Wojcik, John Speicher, and Al Voigt, all mechanical engineers at General Dynamics, and Doug Unkrey. The riders of the vehicle were Leonard (Harv) Nitz, Dave Grylls, and Scott Andrews.

Scott Evans and Bob Burkholder, General Dynamics electrical engineers, designed a digital speedometer which is accurate to 1/10th mph with displays for both driver and rear rider. Voigt designed the sensor transducer for this speedometer using a small rare earth-cobalt magnet to sense 36 holes in the brake disc on the rear axle. This combination gave the fast, accurate updates absolutely necessary for the riders to coordinate their efforts.

Beginning January '79 Voigt began work on a 10 year old dream — to build a machine which could be propelled to high speeds by several riders packed into an aerodynamic shell. Two years ago he discovered that IHPVA (International Human Powered Vehicle Association) actually organized such an event at the Ontario Motor Speedway. This was "now or never" time. Voigt started talking with Steve Wojcik, John Speicher and Garry Lacy. Dementia is contagious. Soon they were all enthusiastically spending every spare moment on preliminary designs for vehicles to set the world speed record. They studied 1 man, 2 man, 3, 4 and even 5 man machines with 2, 3 and 4 wheels, belt drives, chain drives and gear drives, even linear motion drives. Steve Wojcik researched human power and endurance studies and the various possible human riding positions while John Speicher modeled the whole system using a computer. Some of the results of the computer analysis are shown in the section on vehicle analysis.

When the dust finally settled the choice had narrowed to a 3 or 4 man machine, 3 or 4 wheels, with all the riders except the driver using hands and feet to generate maximum power. By now it was the beginning of February and with the race set for the first weekend of May, the choice settled on the 3 man configuration as it could be fabricated more quickly yet still had winning potential, (although the 4 man design had a very slight theoretical advantage.) Simplicity, ease of fabrication

and reliability, along with light weight, good handling and safety were stressed throughout the design.

The detail design and chassis model construction consumed February. From analysis using the scale model of the chassis it was obvious that the machine should have 4 wheels rather than 3 as originally postulated. By now the configuration of the machine was essentially the final one and is shown in the drawing by Steve Wojcik. At the end of February materials were ordered and work on the chassis began in earnest. Here the effects of the "4X rule" began to be felt. The 4X rule, simply stated is: "Everything takes 4 times longer than our original, most conservative estimate." Coupled with Murphy's familiar law we put in progressively more and more late hours to keep the project on schedule. Finding parts and components, especially the 18" Italian racing wheels and sew-up tires, proved extremely difficult. We were at one point resigned to designing and building our own. Fortunately we finally found a source in San Francisco. After many 3 a.m. and 4 a.m. sessions we rolled out, on schedule, the last weekend of March.

Testing that Saturday showed that the long drive chains tended to jump off their chain rings. That afternoon we designed and built guides for all rings and by Sunday morning we were ready for retest. No problems with jumping chains, now the torque on the bottom bracket from the torque of 3 riders twisted the frame slightly and this required extra support. We had planned for these sorts of problems during the early testing phases and had allowed 3 weeks in April to correct problem areas.

Throughout the construction phase we were looking for high caliber riders, which are necessary for a record performance. Because none of us were at that time bike racing enthusiasts we had a rough time finding riders. Finally, only two weeks before the race Wojcik and Evans went to the Encino Velodrome on a Friday night to try to sign up some riders. The rest of us worked on the vehicle. There they met Dave Grylls, Scott Andrews and Leonard (Harv) Nitz, all very interested in riding the machine. They were a stroke of incredible good fortune. Meanwhile, in order to assure that we had a good

riding team for testing and backup, we found Marty Harrison, another engineer at GD in fantastic physical condition and Eric Edwards, a good local bike racer.

With Steve Wojcik they comprised the number 2 team. This team, by the way, ran 53.8 mph — the 4th fastest team time at OMS and less than 1 mph under the previous world record.

The week before the race the body shell was nearly complete and we rented Orange County Raceway for Testing. Unfortunately one of the 1st team riders became ill and they were unable to test that weekend. Things were desperate, with less than a week to go until race day and the first team hadn't even seen the vehicle! We compensated with as much testing as possible with team 2. Finally, Thursday night, with just one day for testing left, team 1 arrived! Dave, Scott and Harv turned out to be 3 of the nicest guys we've ever met as well as national/international class riders of incredible strength and stamina. Practice Friday (May 4) went well but the top speeds were still below the 50 mph mark and we had some doubts about tire friction. We cleaned the machine, packed spares and tools while Steve Wojcik and his wife Wendy finished lettering the body about 1 a.m. Saturday morning.

Qualifying Day. At 4 a.m. we climbed out of bed (had we ever gotten in?) and started loading the vehicle onto Jerry Gray's van, a friend who provided most of the transport and whose help is gratefully acknowledged. In fact, the team and entourage by now had grown to about 25. We never would have made it without Bill and Mike Tayke, Mary, various kids, Judy Voigt, to whose cooking the riders credit their success. at 5 a.m. in the predawn darkness we left for the RACES.

A predawn fog had settled on the Ontario Speedway and we wandered along a surreal road race course looking for the pit area. Finally as day broke and the fog slowly lifted we found the pits and parked next to "White Lightning" the world record holder and the vehicle we'd come to beat. We got our first run about 9 a.m. and came off the bank into the straight

# 's Fastest Powered Vehicle

(by Al Voigt, Steve Wojcik and John Speicher)

## Part 1

(Part 2, "Vehicle Analysis" will be in the Oct/Nov Newsletter)



Al Voigt, Steve Wojcik and John Speicher getting Dave Grylls, Scott Andrews and Leonard Nitz ready to go.

Leonard Nitz looks happy as a sardine in a test tube.



orf!

away past the 500 meter-to-go mark at 56 mph only to find ourselves overtaking a slower vehicle which had started in error before us. Hitting the brakes and coasting we passed this vehicle in the time traps and were thus unable to obtain an official time. From the speedometer we knew the vehicle was coasting at 50 mph thru the traps! After that we knew it was only a matter of coordinating the peak velocity with the timing traps in order to win. This is much more difficult than it sounds. By using computer data and comparing it to the actual speeds attained at the 500, 400, 300, 200 and 100 meters-to-go points we were able to time the riders "kick" to maximize the speed through the 200 meter time traps. Because even the best riders are only good for 2 or 3 maximum effort runs per day, not many trials are available for "tuning in" on this optimum pedaling. We got one good run on Saturday and at the end of the morning we were 3rd fastest at 53+ mph.

That afternoon we cleaned the chains and inspected the machine. Because the riders were getting too much dust we

added a complete bottom to the vehicle on Saturday night. Although this didn't seem to have a noticeable effect on speed, it did make a world of difference to the riders comfort and helped keep the mechanisms clean. We also built a fan system to keep the riders cool during the waiting period before the run after the body is sealed. We had, during the testing, tried a bottom but found that the riders over-heated and nearly suffocated when the vehicle was sitting still. We should have named it Claustrophobia!

On Sunday things went smoothly but while the riders were warming up a headwind of about 8 mph came up. Our first run was into this headwind and netted 55.6 mph. Good enough for a commemorative speeding ticket but still 3rd place. Meanwhile "White Lightening" had pushed the top speed to 56.9 mph. We had only one more try. With wind gusts up to about 8 mph we once more loaded the riders. Voigt ran over the computer runs, told them to do 52 mph by the 500 meter mark, wished them luck and rode to the timing lights to watch the results while the rest of our pit crew completed the pre-run ritual of installing the top and taping the seams. Voigt had never seen it run through the traps before, he'd always been working in the pits. Consensus was that he should watch his baby win.

The headwind had become fairly steady, calming momentarily every 3 to 5 minutes. Voigt told some friends by the traps that this would be the "speed of the meet" at 57 mph and then waited. Several of the slower vehicles came by, seeming to slide along silently, wheels covered by ground fairings. Finally, Vector. In the distance we saw the machine rounding the long sweeping turn and heading down the 500 meter straight.

The machine seemed to move effortlessly, belieing the ordeal with the long streamlined shell. The vehicle slipped by almost soundlessly. Voigt's wife Judy, standing by the timers table . . . waited. Someone said 57! Judy shouted 57! The announcer blasted "57.07 mph, a new world's record!" Officially the headwind was announced as 3 mph at the time of the clocking. It was probably nearer 6 or 8 mph during the acceleration phase of the run. We found later that the riders had entered the 200 meter traps at 56 mph and left at 58 mph!

White Lightening accepted the challenge and took another run, but against the headwind they were able to run just over 55 mph. So the official record stands. We were allowed another final pass and elected to use our team 2 riders rather than switch gearing and try to raise the record with our team 1 riders. The team 2 riders turned in a 53.8 mph effort. The machine was designed to go to 60 mph and we believe that someday it will. But for now, with a total of 7 runs, including practice, for the team 1 riders, we're satisfied. Until next time.



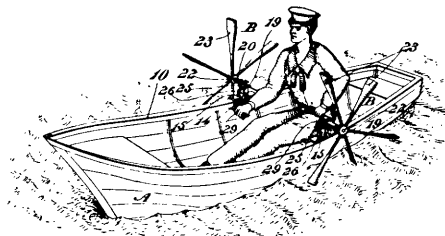
## Public Relations Report

For the 1979 race, the Public Relations budget was less than \$500. For that amount, Paul Van Valkenburgh and Dick Hargrave were able to print and mail: 300 posters to local bike shops; press releases and newsletters to 100 California newspapers and 30 national magazines; spot announcements and newsletters to 50 radio and television stations; and hold a press preview. The final results will not be known for some time, but at last count we have gotten coverage in more than two dozen magazines and newspapers (the past five years total is now over 150 publications). In the next issue we will try to list our exposures so that you can check them out for pictures of your own machines.

Unfortunately, the race was held on one of the worst fuel shortage weekends of the year, and many reporters sent their regrets for not attending. The great irony is that we hold our race to show people how to save fuel, and they can't attend because they have no fuel. This is a golden opportunity for the mass media to carry the word to the great "grounded" majority.

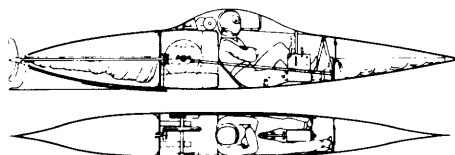
You may see our event ridiculed by a few sensationalist or ignorant media people. Even the most sincere and well-meant efforts can be lampooned — by writers, editors, and photographers. Although bad publicity may be better than no publicity, please do what you can to support those who support us, and educate those who don't recognize the practical aspects of human power.

## Getting Wet



Mr. Resch's Paddle-Boat (1912)

Is the rowboat going to be the only serious human powered water vehicle of our times? Surely someone is designing and perhaps building a sleek ship that will outperform a rowing scull (single) or multi-man racing shell.



John Holland's man-powered submarine (1875)

We are planning to set up a human powered *boat race* and time trials in the next 12 to 14 months. In case you've been pondering the idea, here's what you're up against:

Water: 800 to 1000 times more dense than air. Its viscosity (stickiness) is more than times that of air. Where the wheel and tire is perhaps 96% efficient (4% slippage in transferring power to the ground), the boat propeller (if you so choose) is, on the average 65% efficient

in power transfer. Water moves, the ground does not. Rowing shell records vary due to different water conditions in the various racing locations throughout the world.

Records: According to Tom McKibbons, rower for the Long Beach Rowing Club, most Olympic 8-man shells can do 2000 meters in 5 minutes from a dead start in *still water*. That translates to about 15 mph MAX.

If you're interested in participating in this event, here's what you can do:

1. Help us locate a site (body of water, preferably still) for this event.
2. If you are planning on building a human powered boat — of any kind — please let us know.

Right now we are planning two events: Straight line 200 meter time trials with up to 1000 meter flying start, and head-to-head oval racing, with the buoys 500 meters apart.

Additionally, we are negotiating with Ontario Motor Speedway to use their "Pond" (no dimensions available at this time) to run a demonstration race at the 1980, 6th Speed Championships.

Let us hear from you about any feelings or news you may have about this kind of event. Like our other events, this one will be designed around the needs of the competitor, so let's hear from you! More news about this in the Oct/Nov Newsletter. Thanks a lot!

Bob Shipley, Vice President, Water  
c/o Lil Henry's Bicycling Emporium  
3613 Canyon Crest Dr.  
Riverside, CA 92507

## Editorial

### A Continuing Saga of Wherefore the Newsletter

by Paul Van Valkenburgh

Many people have been asking what happened to *HUMAN POWER* and why it isn't coming out more frequently. The simple answer is that our entire organization — officers, board, race officials, and newsletter staff — is made up of professional people who volunteer whatever time they can spare. In addition to their financial support, they donate literally thousands of dollars worth of free time to support the concept of human power (for vehicles, etc.). It is difficult to enforce deadlines or quotas under these circumstances. In this issue, we present reports from some of these people, to illustrate the amount of effort they have put out in the past year.

As to where the *HUMAN POWER* newsletter is going, we have made some important decisions. First, we all have to know something about costs, circulation, distribution, etc. *HUMAN POWER* reaches about 500 people, and has cost from \$1600 to \$400 per issue to print

and mail (written, edited, designed and pasted up for free). A bicycling magazine reaches about 100,000 people, is supported primarily by advertisers, and can therefore pay up to \$300 for an article. A general interest magazine such as *Popular Science*, *Westways*, *Omni*, etc. reaches over 500,000 people, and pays \$500 to \$1000 for articles. A prime time television show reaches over 20 million people.

Our organization has two media obligations: (1) to provide important basic information to members, when it is still topical and (2) to "spread the word" to the other 200 million Americans (plus other countries) who are not aware of the benefits of human power. The first duty will be provided by irregular issues of the newsletter you see before you, published whenever enough news and volunteer help accumulates. And the second will be accomplished by all of us members selling ourselves and our stories to the mass

media. For the same effort involved in producing one slick annual, we can *sell* many stories to dozens of mass circulation magazines and newspapers, which will reach ten times as many people. In less time than I could negotiate with one publisher, I was able to get TV exposure that will reach a hundred times more people.

Now ask yourself which is the most effective way to promote a concept — and then get busy putting words on paper. There are hundreds of publications out there waiting to *pay us* for our stories.

## College Course in HPV's

The Department of Mechanical Engineering, University of California, Davis, will offer a 2 quarter sequence of classes numbered M.E. 198 in the Fall and Winter quarters of this academic year, which will provide the opportunity for under-graduate M.E. students to design and fabricate, under the direction of three faculty members, a high-efficiency Human Powered Vehicle. The class will be limited to about 12 to 15 students, chosen for their proficiency and particular interest in such areas as vehicle dynamics, aerodynamics and bio-engineering. Each student will be expected to put in 9 to 12 hours per week and will have a final grade based upon a report and participation in the class. The three professors are:

**MAURY HULL**, whose areas of expertise include structural design, bio-engineering and instrumentation. Professor Hull is an avid cyclist, recently finishing 7th in a field of over 500 riders in the Davis Heart of California Double Century race.

**DEAN C. KARNOPP**, a specialist in vehicle dynamics and vibrations with a long-time involvement in high-technology transportation systems.

**HARRY DWYER**, who will oversee the aerodynamic and thermodynamic design for our vehicle. Professor Dwyer is also an active participant in local bicycle races.

Current project milestones are as follows:

Sept. 1: Determination of basic parameters — number and position of riders, wheel number, wheel base and track, etc.

Nov. 1: Completion of frame and drive design, start of fabrication.

Dec. 15: End of Fall quarter

*(Broken Records, con't)*

run and did not compete. Another linear drive machine was built and entered by Peter Johnson.

Johnson's machine utilized a supine position and operated off of foot power only. The fourth linear drive vehicle was named Loco-Motion and featured hand and foot power via an intricate arrangement of springs, pulleys, tiny sprockets and cables. A low profile of 23 inches was achieved through the use of the prone *(con't on page 8 )*

Feb. 1: Completion of aerodynamic design, start of shell fabrication, completion of frame and drive fabrication, initiation of testing.

Mar 1: End of Spring quarter, completion of shell fabrication, frame and drive testing and modifications, start of assembled vehicle testing.

Apr. 1: Completion of vehicle testing and modifications, start of crew practice.

May ? : Speed Championships

This will be a two-year effort on the part of U.C.D. Our first attempt (this coming year) will be a learning experience, and hopefully provide a design of a reliable mechanical and aerodynamic configuration. The following year will be spent optimizing details of the design and reducing weight and drag wherever possible, as indicated by the first year's test. We recognize the value of the experience gained by such groups as that from Northrop University, and thus don't expect to "set the world on fire" our first time out. Rest assured, however, that we will build as competitive a vehicle as we can! We are fortunate to have the talents of Norm Ogle, an entrant in this year's Trials, available to us as a consultant, although just last weekend he was talking about building his own vehicle for next year, so he may find himself rather too busy!

We are seeking commercial sponsorship for our project and have had encouraging responses from several informal contacts. We will be making formal application to these potential sponsors, and hopefully have our budget settled by the time Fall Quarter starts.

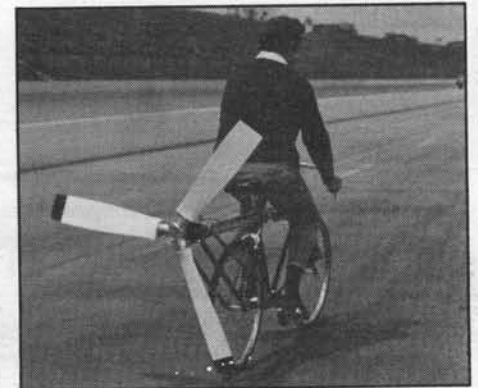
For further information, contact Jeff Williams, Box 1015, Davis, CA 95616 (916) 758-5173.

## Innovators to Challenge Bike Racers

For the first time, Human Powered Vehicles will meet Racing Bicycles on an established bicycle race course. At the Tustin Dog Days Criterium, Sunday, August 26th, an event has been set aside for the challenge.

The Tustin race is run on a flat section of city streets including four 90° turns. The course is about one mile around. This event is sponsored by Beverly Hills Federal Savings with all proceeds going to Children's Hospital in Orange County. This event will be shown live on KNBC, Channel 4 at approximately 3 p.m.

All bicycles and the challenging HPV's will start together from a standing start and run for 8 to 10 miles, enough to show just who is superior. If you have a vehicle which you think could compete successfully, or you would like to display only, contact: Allan Abbott, P'O' Box 1847, Idyllwild, CA 92349. Phone (714) 659-4636 (days).



*Nicely built prop-bike. Hard to get started.*



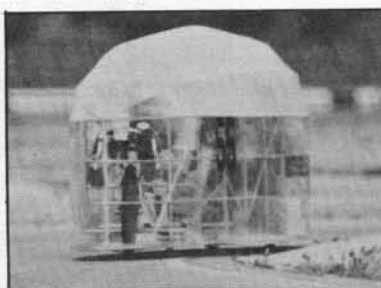
*Who's this?  
We don't know,  
but this sure is a  
nice shot of #31  
coming 'round a  
corner.*



▲ *The Winner! Fred Tatch with make-shift fairing.*

◀ *2nd place (Road Race) Daniel Egger's Prone Bicycle leading Jim Gentes and the Gomez Bros.*

◀◀ *Norton's tandem coming out of esses. Handled well.*



(Broken Records, con't)

position and tiny 12 inch soapbox derby wheels. A "breadboard prototype," builder Willmot White built it primarily with practicality and the one hour event in mind.

Constructed of a maze of small diameter tubing, an entry by Riverside Bicycle Club builders Blaine Rawdon and Dave Blanding brought back memories of the old "Bird Cage" Maserati racing car of the early 60's in its framework. The four 20" sew-up tire wheels were canted inward for added stability and the entire fairing was made of custom formed styrofoam covered with ultra-thin fiberglass. An hour record entry, it suffered from a number of complications including a late start and lack of rider training for pilot Jerry MacAulay.

Despite this display of innovation, only the Van Valkenburgh and Martin/Dean machines were successful at the 200 meter timing traps. Recalling the abysmal beginnings of the Martin/Dean vehicle, however, it is clear that any one of these singles would be record setting prizewinners at future speed championships.

#### One Hour Record

The 55 mph barrier was not the only goal to be reached at this year's event. Saturday's first event was an hour record

attempt. Pedaling through "pea-soup" fog aboard the Kyle/Teledyne streamliner, Ron Skarin set a new hour distance record of 31.88 miles.

Conditions for the hour run were extremely poor. Ensclosed in a heavy fog, all of the enclosed vehicles had to grope their way around the oval auto racing circuit, never sure of what lay ahead or behind.

These conditions necessitated an unscheduled stop on Skarin's run, during which he punched out his windshield and donned a pair of undershorts over his head to keep condensation from blinding him.

Despite the trials and tribulations of fog, Skarin found his hour run to be relatively easy. Commenting on the recordbreaking effort afterward, he said, "It went by unbelievably fast . . . it was like an hour of riding (a standard bicycle) at 15 mph; that's what the effort felt like." Clearly, without the pit stop much more could have been accomplished.

The fog also resulted in the first two-vehicle crash of the IHPSC's five year history. This occurred during the hour record run when Mark Capron, piloting his and Alec Brooks' "Bun-Burner" — one of the original IHPSC machines — crashed into the back of a much lower new creation called "Locomotion." The

altercation sliced a large gash in Capron's hand and created a massive hole in his vehicle's fairing. Locomotion's plexiglass fairing was shattered at the rear. Capron was moving at 10 to 15 miles per hour faster than Locomotion upon impact according to team members. Raphael and Vincente Gomez earned second place aboard a standard fairing covered tandem. Their distance was 31.33 miles. Third place fell to Gerry MacAulay, who rode a supine single built by Blaine Rawden and Dave Blanding of Riverside.

#### 35 KM Road Race

For the second year, another LeMans style start road race was run, this one for a distance of 21.6 miles (35 km). Utilizing the 2.7 mile (4.3 km) road circuit, Fred Tatch won the event averaging 29.88 mph (48 kph). As expected, the standard bicycles with only front fairings got off first, but within a lap the full fairing machines were in the lead, Tatch well out in front.

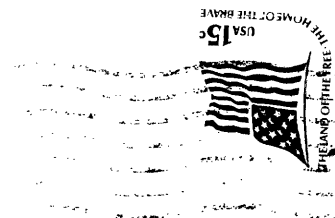
The road race is the favorite event of Dr. Allan Abbott, who looks to the IHPSC as a means for encouraging the development of human powered vehicles that are practical for daily transportation. Tatch's victory was a major advancement in this regard, inasmuch as he uses the same vehicle for his daily commute to work in Eugene, Oregon.



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Except as noted, all photos courtesy of George Naoum, P.O. Box 2255, Alhambra, CA 91803 (213) 281-0061.

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