

Prof's shuttle experiment part of nationwide effort

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highly charged particles from ones of lesser charge. However, on Earth this process encounters difficulties due to sedimentation and convection, Todd said.

Sedimentation is the downward movement of suspended particles due to gravity. Convection is another gravity driven phenomenon. When heated a warmed fluid rises, and the cooler denser fluid is drawn toward the Earth (by gravity).

"We can correct for these problems just so much," Todd said. "It's hard to keep cells in suspension because they tend to settle."

Todd said that applying an electrical field to a column of fluid is analogous to turning on a television set. The television feels warm, he said, because of heat produced by resistance. The electric current produces heat in the fluid column in a similar manner—because of resistance. The warmed fluid becomes less dense, and convection results.

Without gravity, neither of those problems can occur.

Experiments aboard Apollo-Soyuz in 1975 showed that the zero gravity of space could enhance separation by electrophoresis. The experiment aboard the shuttle, called the Electrophoresis Equipment Verification Test (EEVET) will determine exactly how much better the separation can be.

"In terms of how it (zero gravity) modifies the earth-based process," Todd explained, "it means that you can use larger containers to do these purifications because you don't have to cool them (to prevent convection)."

Todd said the separation of cells would be five times as great, and that the number of cells involved could increase 15 times because of the lack of any need to cool the apparatus.

"So already the experiment they're doing today is in concept a 150-fold improvement over what we're doing here in our lab," he said.

This particular biological system was chosen for study, Todd said, because it ultimately has practical application. Blood clots can sometimes move around the body and reach critical sites such as the heart, where they can be fatal.

The cells, prepared and frozen in Houston, went into the shuttle 40 hours before the launch and remained frozen until the astronauts activated the experiment. Upon completion of each part, the cells will be re-frozen for analysis on Earth.

"They did most of our work early because of other difficulties—the toilet wasn't working, they didn't feel good, the hydrolytic system was misbehaving and the heat shield was coming off," Todd said.

"It's much easier (than other experiments) to do to because it doesn't require precise hand-eye coordination on the part of the astronaut, and it doesn't

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—Paul W. Todd, University biophysicist

require the operation of sophisticated feedback equipment."

Each part of the experiment in space is about an hour long, compared to two hours on Earth. An automatic camera took pictures of apparatus and dials every minute, and occasionally the astronauts were asked to give voice-downs, or actual voice descriptions of the experimental data, to Mission Control in Houston. Todd has been in constant contact with Mission Control and some of the other researchers involved as well.

The project is a collaboration of research teams across the country. In addition to the University group, involved in this experiment are scientists from the Marshall Space Flight Center, McDonnell Douglas Corporation, Michael Reese Institute and Lehigh University.

After the flight, the glass columns containing the frozen separated cells will be taken to Houston. There they will be divided among University scientists, said Grant H. Barlow, a specialist in urokinase at Michael Reese Institute in

Chicago, and Principal Investigator Dennis Morrison at Johnson Space Flight Center.

"In a short time Grant Barlow and I will go to Houston and some of the cells will be thawed out and placed in culture, and which cultures that contain the urokinase-producing cells will be determined," Todd said.

Todd explained that the first set of samples will be evaluated in Houston.

"Some of the other samples will come to our lab, the idea being I'll be a verification of what is found in Houston," he said.

"More importantly, we'll be adding some of the techniques we're capable of using to find out more detailed information about each fraction of cells that was sliced out of the frozen columns."

Essentially the scientists will count the cells, measure their size and viability, grow them to see if they are producing the correct product and measure the amount of urokinase cells for about 2½ years, Todd said his lab's role

has been many fold: to help determine by experiments the choice of buffer going into the glass columns; the choice of cells used for study; the choice of medium in which to grow the cells; and the choice of methods of analyzing the cells—pre-flight and post-flight—for products.

Another job of the researchers is to make predictions of the experimental results.

"You don't do a scientific experiment with all unknowns," Todd said. "You have to have positive and negative controls."

Todd explained that of the eight columns of cells in the experiment, two have human and rabbit red blood cells together as test particles. These cells, he said, are very easy to separate.

"We already know what the mobilities should be with the rabbit and human cells," said senior research technologist Elaine Kunze.

"If those particles are working properly, then we can take cells that are unknown, such as the human kidney cells, and be sure at least that the apparatus is working, and that the buffers we put in are working properly," she said.

Those controls were performed before and during the space shuttle flight.

Lindsay D. Plank, a postdoctoral worker from Hastings, New Zealand, has devised a way to mathematically predict what should happen by using parameters of cell mobility.

"Using the numbers I've come up with I can then apply those numbers and put them into mathematical equations for the operation of the columns here, and similar ones in space, and come up with predictions of the migrations of bands of cells," Plank said.

"We get quite good agreement of the theoretical numbers and physical data from those columns," he said.

The researchers have decided to spread out the process of investigation over several months.

"We're going to take one column of cells at a time, complete the analyses of those cells, then go on to another one," Todd said.

"We'll be at a point in which there will be nothing more to learn, and ready to state our conclusions probably by Christmas," he said.

The University scientists will continue to be involved in similar projects for quite some time. They will continue to provide biological materials for future shuttle flights for McDonnell Douglas Aerospace Corporation, which has funded the project 100 percent.

Engineers and technologists there have been developing a type of apparatus which employs a process called free flow electrophoresis. The cells flow one way, similar to a waterfall, and the electric field sweeps cells out sideways as they flow by. Urokinase production could be increased as much as 400 fold, Todd said.

"Our job is very far from over," Todd said.

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Georgetown, North Carolina to clash for NCAA hoop title

By JOHN NELSON AP Sports Writer

NEW ORLEANS (AP) — James Worthy of North Carolina and Eric "Sleepy" Floyd of Georgetown renew an old rivalry tonight when their teams do battle for the national collegiate basketball championship.

"I've known Eric since seventh grade,"

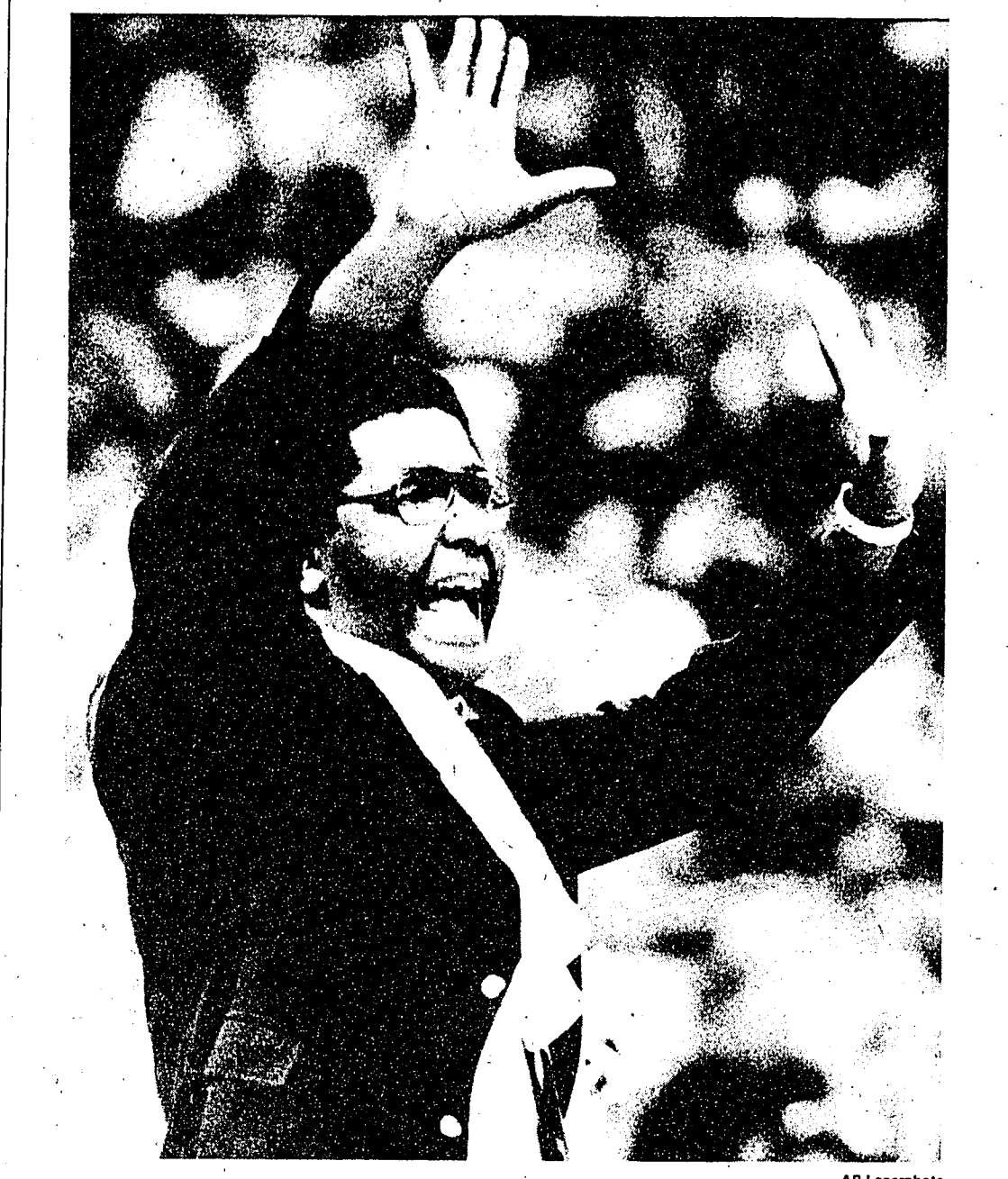
Worthy said. "We went to the same church, and we sat together. We never thought we'd be playing against each other for the national championship, though."

Worthy, a junior, and Floyd, a senior, each represents a crucial part of his team's chances tonight. They grew up about two miles from each other in Gastonia, N.C. Worthy attended Ashbrook High School; Floyd went to Hunter

Huss, eight miles away.

"They beat us four times one year," Floyd said of Worthy's high school. "Once in a holiday tournament, again in another tournament and twice in the regular season."

"We wound up in different brackets in the state championships, though, and we played for the state title. We beat them with a shot at the last second," Floyd recalled.



Georgetown coach John Thompson's sixth-ranked team is ready to battle No. 1 North Carolina in the finals of the NCAA championships at the Superdome in New Orleans, at 9:15 p.m. tonight.

"The shot, Floyd remembered, was not his, but he would like to change that tonight when sixth-ranked Georgetown meets No. 1 North Carolina in the Louisiana Superdome before what could well be another National Collegiate Athletic Association record crowd and a national television audience on CBS. Tipoff is scheduled for 9:15 p.m. EST.

All-time NCAA basketball attendance record was set Saturday during the semifinals when 61,612 fans witnessed the North Carolina and Georgetown triumphs. The Tar Heels defeated unranked Houston 69-63, and Georgetown beat No. 20 Louisville 59-46.

Worthy and Floyd, who was overlooked by North Carolina when he was recruited four years ago, have kept their friendship alive by seeing each other during the summer. They will have to join their coaches in setting aside personal feelings tonight.

North Carolina coach Dean Smith and Georgetown's John Thompson have been buddies since Smith began recruiting players from St. Anthony's High School in Washington, D.C., where Thompson was head coach for six years.

"We'll play as well as we can — that is our goal — and our friendship won't affect that," Smith said. "We'll probably sit down some day and talk about this."

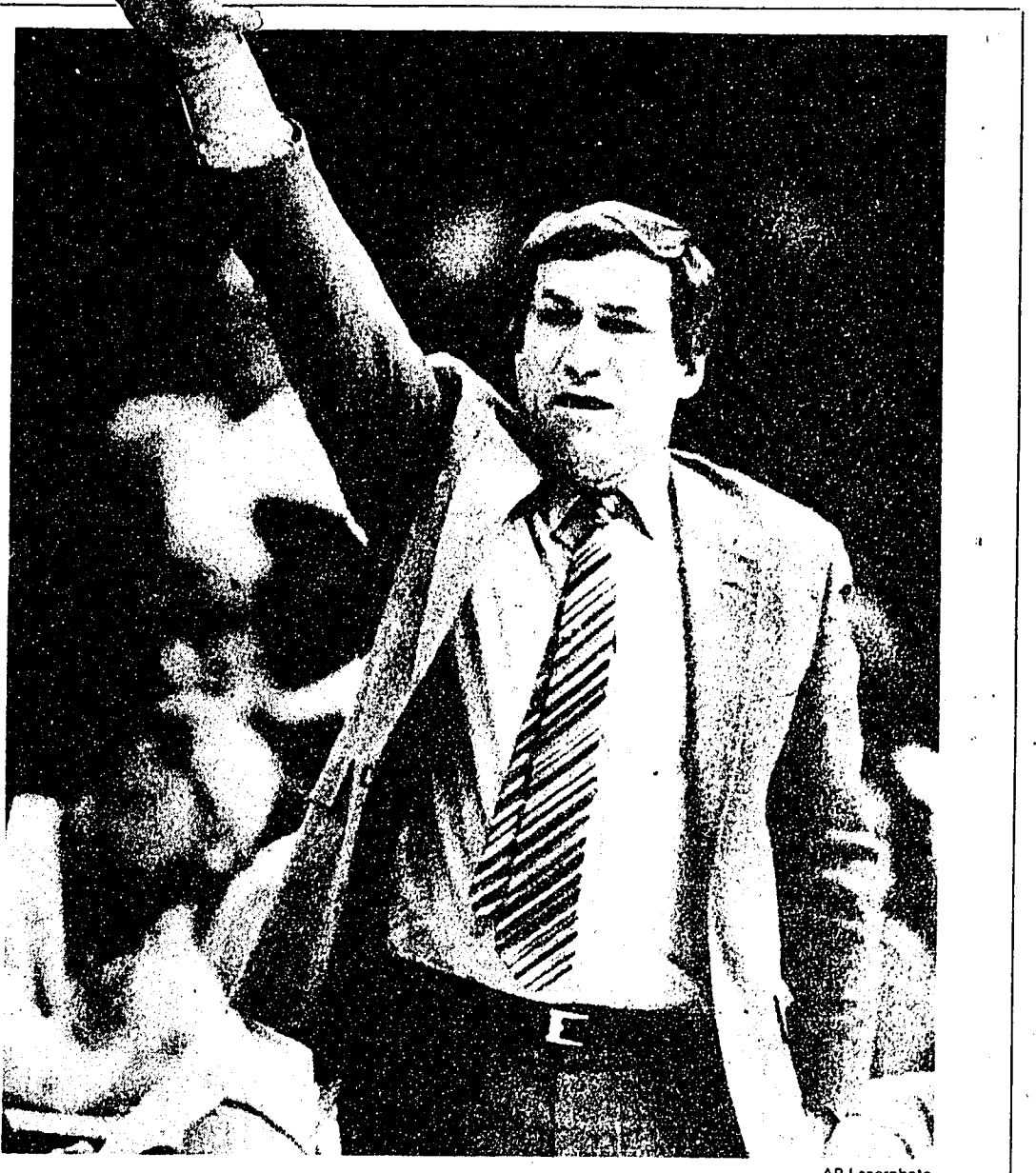
"Once in a while I hear coaches say, 'I won something.' But that's silly," Smith added. "The pros should be 'we' or 'even' they're 'they' the ones that play the game."

He pointed toward Worthy and guard Jimmy Black, who shared the stage with Smith at Sunday's news conference.

Smith's players feel they have a lot at stake in this game, particularly in trying to take the pressure off Smith, who has taken six previous teams to the Final Four without a national championship.

The Black-on-Floyd matchup could play an important role in the championship game as the more publicized battle between Georgetown freshman Pat Ewing and North Carolina's John Worthy and Sam Perkins.

In the Tar Heels' crucial victory, Black saw most of the man-to-man defensive duty on Houston's Rob Williams, who was held to just two free throws. Williams, who came into the game averaging 21.8 points, was 9-of-8 from the field.



While North Carolina's Dean Smith is ready, too, Smith is ready to win his first national championship as a coach in seven trips to the Final Four.

Floyd, a 6-3 All-American guard, averaged 16.8 points per game for Georgetown, although he had only 13 against Louisville after hitting only 3-of-11 from the field.

"Jimmy Black will see some of Sleepy Floyd tomorrow," Smith said. "We're concerned Floyd will come out firing because he didn't have a good shooting percentage in the semifinals."

Floyd downplayed his importance to the Georgetown offense.

"Louisville played very good defense against us," Floyd said. "They were tenacious. They were all over us. Every shot I took was a tough shot because I had a hand in my face. Anyway, I don't have to score a lot for us to win. We play team offense."

A key to that team offense is Ewing, Georgetown's 7-foot center. Thompson feels that Georgetown's defense creates a lot of its offense, and in that area, certainly, Ewing is the key.

"He jumps well and he's got great quickness," Worthy said of Ewing. "We'll stick to our basic man-to-man defense and try to help each other out, but we have to stay with what we do best."

Although Worthy said he had not seen tapes of Georgetown, he and Perkins, both 6-9, will become well acquainted with Ewing in the final.

Ewing had only eight points against Louisville, but he grabbed 10 rebounds, was an intimidating presence under the basket. His real value is his ability to change an opponent's offensive philosophy.

"We'll be conscious of him," Black said. "It's hard to throw the ball over a 7-footer, but we'll try to stick with our regular offense."

Part of that regular offense is the four-corner delay that Smith pioneered. The Tar Heels used it for the last seven minutes of the Houston game, and Smith said he wouldn't hesitate to use it against Georgetown if the opportunity arose.

Spikers down Ohio State in rematch

But victory marred by official's controversial call

By TONY SMITH Collegian Sports Writer

At first, it looked like an instant replay of what had happened two weeks earlier in Muncie, Ind.

At Muncie, the men's volleyball team had a difficult time against Ohio State, losing three out of four games. And the prospects did not look encouraging Saturday night when the two teams met for a rematch, with the Lions getting slaughtered in the first game.

"Oh no, not again!"

Well, it didn't happen again. The fourth-ranked Lions (25-2) battled back to defeat the seventh-ranked Buckeyes (24-5) in impressive fashion, 6-15, 15-11, 16-14.

The match was excellently played by both teams, although Penn State appeared to be the stronger of the two and may have proved to most of the fans at Rec Hall that they deserve to be ranked fourth in the country, if not higher.

Nevertheless, while the victory was a rather convincing one, the match was marred by controversy over an official's call at the end of the third game of the match, in which the Lions, who were serving at the time, were leading, 14-11.

A spike by the Buckeyes' Michael Hill, which would have resulted in a side-out to Ohio State, was disallowed when Hill was called for a line violation, his foot apparently landing on the other side of the net before the ball hit the ground.

"It's impossible!" Ohio State coach Jim Smoot said when the ruling was made. "There is no way in the world that could have happened!"

So, instead of a side-out to Ohio State, the point (and the game as well) went to Penn State (15-11).

After the match, Smoot did not want to talk much about the call itself, but said he was not satisfied with the officiating in general.

"I was satisfied with the umpire (Russ Rose) and the line men. I guess I should say line men, since they were girls," Smoot laughed. "And that's about it."

Rose explained that it was his job to rule whether a line violation had been

made, while the other official (Don Kruger) was to judge whether the ball hit the floor before the violation was made.

"I don't know," Penn State head coach Tom Tait said when asked if he thought the ball hit the floor first. "It was a call I'm glad I didn't have to make."

Indeed, even when watching a videotaped replay of what happened (in slow motion) after the match, it was not easy to tell whether the ball hit the floor before or after Hill crossed the line.

Nevertheless, Smoot said he felt the call was a turning point in the match. Perhaps. But the term "potential turning point" seems to be a more accurate term to use.

Penn State had already seized the momentum of the match by winning the second game of the match and taking a 14-11 lead in the third game.

If anything, the call simply prevented the Buckeyes from getting the opportunity to shift the momentum back in their favor.

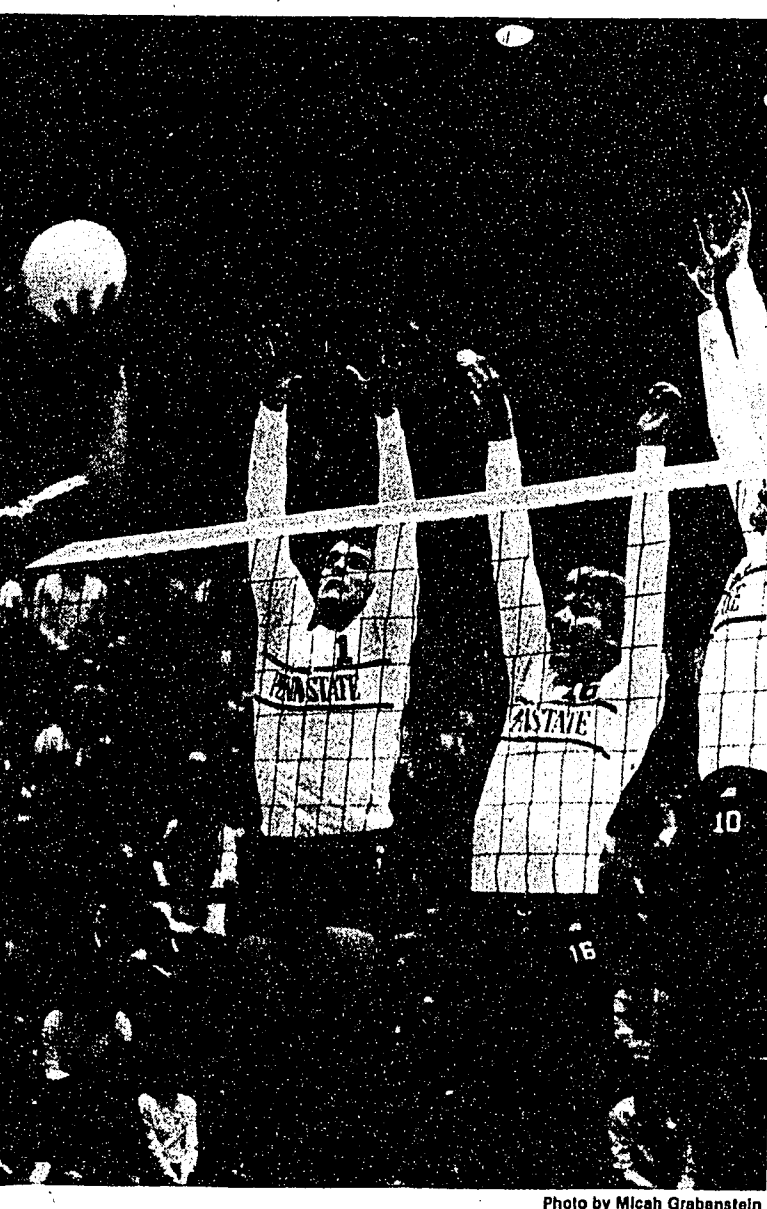
At any rate, the win almost ensures that the winner of the Eastern Collegiate Volleyball League Championship tournament, which will be held in Rec Hall May 7-8.

Meanwhile, the Midwest representative — probably Ohio State or Ball State — is expected to receive the No. 4 seed, since California teams usually take up the No. 1 and 2 seeds.

Initially, Tait had Guyon on Sherman, who was showing, although the first game was a disappointment because of a strategy which turned out to be ineffective.

"The matchup we had involved our left-side blockers, Harpo (Mike Guyon) and J.J. (Jeff Johnson)," Tait said. "I thought I knew which one I wanted on (Ohio State's) Craig Sherman, but it didn't work out."

Finally, Tait had Guyon on Sherman, who competed on the 1980 National Junior Olympic team with Lion co-captains Mark Kraynik and Bruce VanHorn.



Men's volleyball players Bruce VanHorn (left), Mark Kraynik (center) and Jeff Johnson (right) jump in unison to block an Ohio State player attempt to spike, Saturday night in Rec Hall. The fourth-ranked Lions overcame the seventh-ranked Buckeyes to win 6-15, 15-16, 16-14.

Guyon had a rough time, so in the second game Tait put Johnson on Sherman and assigned Guyon to block in a spot where Ohio State had three hitters.

This strategy paid off. Johnson did an effective job on Sherman, and Guyon's performance also seemed to improve.

The Lions also succeeded in neutralizing OSU's Dave Jandasek, who competed in the 1981 National Sports Festival with Johnson, Kraynik and VanHorn.

"We blocked him well," Tait said. "Dave is a streak player; when he is a dark, dark, darkhorse. It worked to our advantage."

Lady Lion gymnasts 3rd at NCAA finals

By KEITH GROLLER Collegian Sports Writer

After all the injuries and other problems during the women's gymnastics team has encountered this season, its chances of finishing third in the team competition of the NCAA championships seemed to be about as good as J.R. Ewing has of beating Georgetown's Patrick Ewing in a one-on-one basketball contest.

But to the surprise of everyone but themselves, the Lady Lions did just that Friday night in Utah, scoring a 142.10 to finish behind the powerful top-seeded Utah and Cal State-Fullerton.

Defending floor exercise champion, sophomore Heidi Anderson, failed to repeat in that event, finishing second, and wound up tied for third in the all-around. Still, the meet was a dream come true for Penn State.

"Before we left, we all made predictions and most picked us to finish third," captain Marcy Levine said. "We were all dreaming a little bit, but we all knew that in our hearts, it was possible."

Penn State started the year with just six healthy gymnasts. Then, in early January, two of those gymnasts, Joanna Sims and Linda Tardiff, were sidelined with injuries. Through the heart of a schedule that made the football team's look easy, the Lady Lions kept on winning, until fatigue and the heavy competition caught up with them on a long West Coast swing when UCLA, Utah, and Oregon State defeated them.

Penn State won the NCAA Northeast Regional title (no big deal, since the West has all of the top teams) and was seeded a low (for Penn State) ninth. The ninth-seed put them in the first rotation, which was thought to be a minus for the team, since scores tend to rise later in the night.

So, the Lady Lions flew into Utah as a dark, dark, darkhorse. It worked to their advantage.

"Us being seeded so low, took much of the pressure off," said Joanne Beltz, who was a member of the team that won the national title two years ago.

It was the Lady Bruins who marked the low point of Penn State's season with an upset win March 4, and it was the same team that pushed the Lady Lions to their highest point Friday.

UCLA happened to be in the first rotation with the Lady Lions. Just where Anderson wanted them.

"We really wanted to get back at UCLA," Levine said. "We wanted to prove that we truly were the better team."

The Lady Lions did just that with solid performances on both the uneven bars and the beam. With Anderson hitting a 5.5 and Levine an 8.5 on the bars, Penn State led a slim 107.20-106.20 into the final events, beam for the Lady Lions and floor exercise for the Lady Bruins. The exact same situation that occurred when UCLA stunned Penn State.

Despite a fall during a back aerial, Anderson recorded a 9.15, Levine a 9.10, Tardiff a 9.00 and Beltz contributed an 8.65. Viola Penn State had beaten UCLA and had nothing to do the rest of the night, but sit back in the stands and watch the rest of the teams go to work in the second rotation.

"We were sitting in the stands on pins and needles, just figuring out all of the scores," Beltz explained. "We knew what everybody needed to get and when it was all done, we couldn't believe that we were actually third."

As it turned out, the only team that the Lady Lions fell way short of was mighty Utah. The Utes seem to have more quality gymnasts than the Morning Tabernacle Choir has singers. Anderson's total of 36.85 tied her with Oregon State's Mary Ayoite-Law in third place. It was Ayoite-Law who dethroned Anderson as floor exercise champ with the Lady Lion finishing a distant, dark, darkhorse. It worked to their advantage.

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