

# SPORTS FEATURE

## Blood doping: An unfair advantage

By DAVID BUNDAS

In 1968, Norman Gledhill applied for a position at York in the Physical Education department. Under the impression he had not received the job, Gledhill embarked on a trip across Europe with his wife. At an American Express office in the south of Spain, Gledhill received word that he had been hired by the University as a coach and teacher.

17 years later, Doctor Gledhill was appointed Director of Physical Education and Athletics at York and his physiological research, specifically on blood doping, has had international significance.

From 1978-82 Gledhill conducted his historic research on blood doping. Blood doping is a method of providing more oxygen to the working muscles by taking blood out of a person and reinfusing the blood between five and 10 weeks later. At this time, the body has replaced the red blood cells (RBC's) taken out and can benefit from the reinfusion of that blood. Essentially, the more oxygen that is provided to that person the harder they should be able to work. Their results should improve as a consequence.

People who had done research in the past, however, were confronted with problems (increasing oxygen) because they had stored the blood with the basic refrigeration technique. This technique allowed for the blood to be stored for a maximum of only three weeks because of health regulations. Therefore the blood would have to be reinfused within that time limit when the body had not yet replaced the RBC's taken out. This made it impossible to increase the amount of oxygen made available to the body.

After Gledhill completed his PhD, he started doing research with the Physiology unit of the Sick Children's Hospital. In discussing the topic of blood doping with the hospital's staff, they suggested the frozen blood technique as a viable method of storing blood for longer than three weeks.

This technique primarily used for storing rare blood and originated



LOOKING CASUAL: Dr. Norman Gledhill.

during World War Two allows for the blood to be frozen for up to 10 years. It actually suspends the RBC's in time, so if a normal RBC lives 120 days and is frozen when it is one day old, it will live 119 days when it is thawed.

Gledhill's research team was given a \$6,000 grant and access to hospital facilities, and it was there that he began researching what happens to the body when blood is taken out and put back in.

"We wrote letters to everybody saying, 'This really stinks and something had better be done'."

For the first study, Gledhill, two graduate students, and his lab technician, took blood out of themselves. They followed this with daily and sometimes hourly monitoring to discover what was going on in their bodies. "We found that for the first couple of weeks our bodies ignored the fact that blood had been taken out and didn't make any effort to bring us back to normal," Gledhill explained. "Finally the system kicked in and accelerated the production of RBC's and by three weeks time the body was about 50% back to normal; therefore we really had no chance of increasing hemoglobin (oxygen)," Gledhill added.

The only way to increase hemoglobin levels is to reinfuse blood into

a body with normal RBC content, and it takes the body at least five weeks to return to normal when blood is taken out. "The basis of blood doping," Gledhill explained, "is that by increasing hemoglobin you can increase the amount of oxygen—therefore you can do more work. So, if you go back in the chain and you don't get an increase of hemoglobin, then the whole thing's a waste of time."

What Gledhill concluded was that to increase hemoglobin the blood would have to be out of the body for more than three weeks. The only way to store the blood that long would be to freeze it. His research proved that after blood is taken out of the body, it takes a full five weeks (and up to 10 weeks for a long-distance runner) before the body returns to normal.

When they kept the blood out for five to 10 weeks and reinfused it, sure enough they got a 10 percent increase in hemoglobin—which is a significant amount. Gledhill explained the process of how the person with increased levels of hemoglobin comes back to normal. "Initially there was a 10% increase in hemoglobin but as the RBC's that were frozen (and reinfused) die off, eventually the person goes back to his original RBC make up. This period is usually around 120 days," Gledhill said.

For the very first time Gledhill and his team had a viable method of inducing this blood doping condition, which is clinically described as "induced erythrocythemia." Using "hindsight research methods" Gledhill was able to prove that blood doping definitely increases the oxygen carrying capacity, allows the oxygen utilization to increase, and it also translated into an improvement in physical performance.

Upon completion of the innovative study, questions were raised about doing something to prevent athletes from using this blood doping technique to enhance their performance level.

In the early seventies, an unheard-of runner came out of the woodwork to win three gold medals at the 1972 Munich Olympics. This Finnish runner, Lasse Virén, went back into hiding (avoiding international track meets where he could have profited for appearing) and reappeared for the Montreal Olympics where he won another two gold medals. Under allegations of blood doping, Virén was evasive answering reporters' questions about the subject, saying things like, "Why would I do that, when all the research says it doesn't work?"

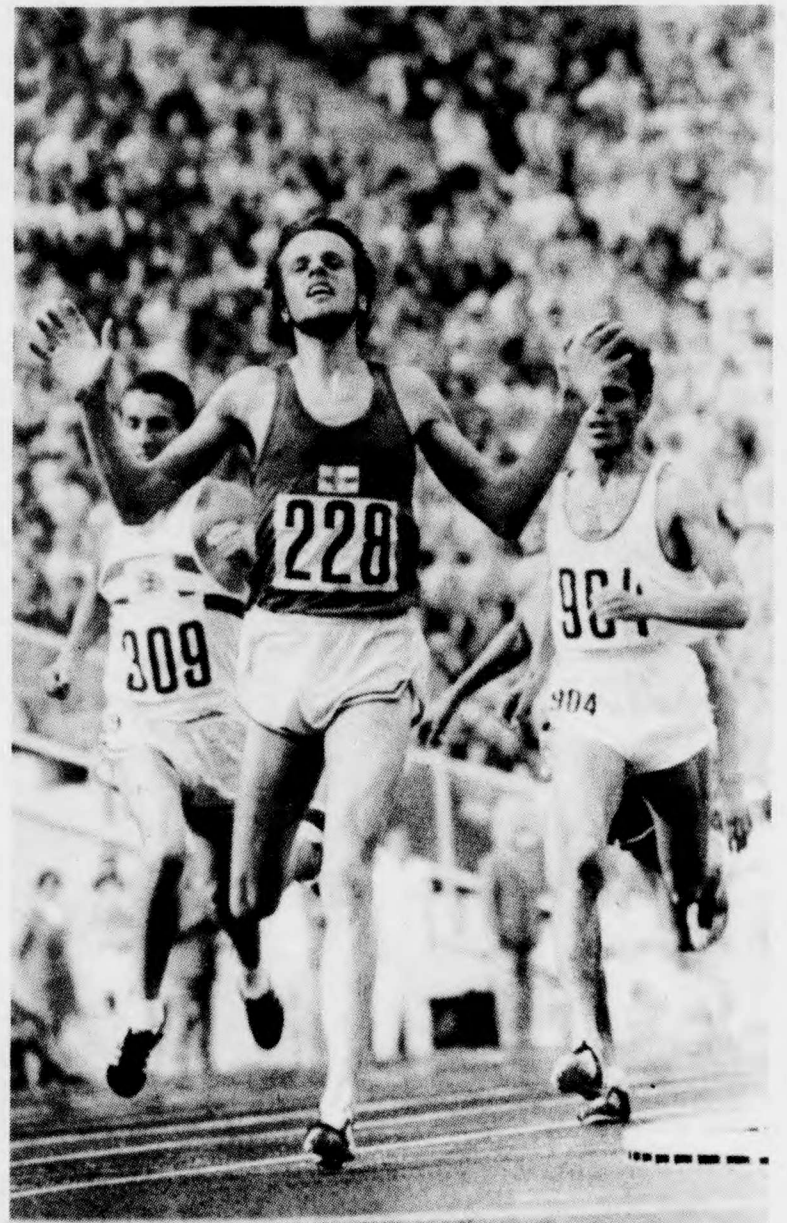
Gledhill went to the chairman of the Medical Commission of the International Olympic committee, Arnold Beckett, to discuss his research and its implications. "I told him of our research and how we, along with our peers, saw it as fool-proof, and that he had better do something about blood doping in sports," Gledhill said. "Unfortunately, because we had no detection technique—and we still don't to this day—he refused to do anything about it."

Finally in 1984, after six medal winning USA Olympic cyclists readily admitted to blood doping, something was done. "At that point in time I was the chairman of Doping Control for Canada, and we wrote letters to everybody saying, 'this

really stinks and something had better be done,'" Gledhill said. Within two months blood doping was officially banned.

In October of last year Dr. Norman Gledhill won the Sports Canada Achievement Award for his outstanding contribution to Sports Science Canada—making him the inaugural recipient of the honor. Two weeks ago he was a finalist for the Air Canada Amateur Sport Executive of the Year Award, and people are finally recognizing his important contributions to sports in Canada.

Next Week: Dr. Norman Gledhill discusses the implications of soda loading as another unfair advantage in track and field. It has yet to be banned by the IOC.



THE FLYING FINN: Lasse Virén, after his victory in the 5,000 metre at the 1972 Olympics.



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