JOURNAL OF THE SA SPORTS MEDICINE ASSOCIATION

SPORTS MEDICINE
SPORTGENEESKUNDE

TYDSKRIF VAN DIE SA SPORTGENEESKUNDE-VERENIGING

- Rugby Violence Condemned
- Eddie King on Triathlons
- Sports Medicine Continuing Education Course

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RUGBY VIOLENCE CONDEMNED

Dr Clive Noble MB BCh, FCS (SA), Editor-in-Chief

The recent Burger Geldenhuys rugby incident in which New Zealand captain Andy Dalton was punched from behind and suffered a broken jaw must, from a medical viewpoint, be condemned in the strongest terms.

One of the major aspects of the principles of medical care is the prevention of injuries. In South Africa dirty play has become part of the game. It is a factor which can be prevented by stricter control.

It is about time that the great game of rugby be taken out of this sphere of barbarism. To a large extent the solution is quite simple and calls for stricter refereeing and far more severe punishment.

It was interesting to note that the Welsh referee, Mr Roland, allowed no dirty play in test matches, largely due to the fact that he made it known that any player guilty of misconduct would be kicked off the field.

At a recent high schools rugby game, I saw one player deliberately kick another. His punishment from the referee was to be sent to the "cooler box" — for possibly one minute — and then being allowed to play again. This is obviously inadequate punishment.

I would like to see dirty play stamped out at grass-roots level and feel strongly that such acts of violence on the rugby field should be penalised. Not only should the player be sent off the field but he should be unable to play for a number of games, depending upon the degree of violence involved. Should he commit further acts of violence, despite such disciplining, then he should be banned for good. The school principal should take action against him as a person who has grossly degraded the name of the school. A similar punishment system should take place at senior level as well.

Suitable touch judges should also be selected for all games. One of their main responsibilities would be to spot dirty play. The referee must be fully supported by rugby administrators in their condemnation of dirty play.

SASMA Continuing Medical Education Programme

This programme, which is aimed at general practitioners will also be suitable for physiotherapists and other interested paramedics. The course will take place at Wits University on August 8 and 9.

It is hoped that all doctors who are interested in sports medicine and who wish to gain further knowledge of sports medicine will attend. Topics to be discussed include sports traumatology, physiology, psychology, psychiatry and cardiology. It will be a comprehensive programme giving general practitioners a better insight into the management of his sports patients.

The general public has often consulted alternative medical practitioners as they feel that many doctors do not have sufficient interest or knowledge to treat their sport problems. It is hoped that this congress will help to change this viewpoint.

Comrades Marathon Injuries

The Comrades Marathon has come and gone. For those interested in sports medicine it was a busy time, especially pre-Comrades when many training injuries were reported.

Most of these injuries are related to excessive training on bodies which have not adequately adapted to the stresses imposed upon them. Most practitioners see at least four times as many novices as experienced runners with injuries due to Comrades training.

The experienced runner appears to know his body and also is more capable of adapting to stress. The beginner, fearing the 90 km run, tends to overdo his training in order to make sure that he is fine on the day.

Unfortunately he often doesn't make the day due to injury.

Shortly before the Comrades Marathon such factors as correcting biomechanical abnormality or even reducing the main cause of problems — excessive distance, speed or hill training — cannot be adequately implemented. To a large extent treatment must follow the race.

Such modalities as psysiotherapy and the application of ice are extremely helpful. However the use of cortisone and non-steroidal anti-inflammatory agents play a major role.

It has become clear to me that there has been a drop in the injury rate, very possibly due to the excellent advice given by many experienced runners and clubs. Adequate training programmes have also helped to prevent injuries. I only hope these will continue into the future.

Dangers of Aerobics

With increasing leisure time available and a very definite tendency by the general population to improve the state and function of their bodies, aerobics has become a popular form of exercise. Unfortunately, this has not been without problems. The most significant has been the injury rate which even occurs in such a well-controlled exercise programme as aerobics.

"Exercises such as repetitive touching of the toes and excessive stretching, particularly of the ballistic type as occurs in some aerobic classes, overloades the ligaments, muscles and discs in the spine and creates problems."

Two factors are largely responsible. As in all forms of physical fitness, the body has to adapt to the stresses imposed upon it. A common practice in aerobic classes is that the rank beginner competes with the experienced exponent, thus loading his body and causing a multiplicity of injuries.

Chief among these are shin splints, patella injuries, and backache. Backache is largely due to the second problem — that is executing movements which are out of the normal pattern. Abnormal loading results. Exercises such as repetitive touching of the toes and excessive stretching, particularly of the ballistic type as occurs in some aerobic classes, overloades the ligaments, muscles and discs in the spine and creates problems. It is essential that all aerobic instructors/instructresses be given lectures in anatomy and bio-mechanics, as well as obtaining knowledge in the prevention and early treatment of injuries. In this way aerobics, with its fantastic physical rewards, will go a long way towards improving the health of our nation without creating major disability.

EDDIE KING ON TRIATHLONS

The old adage that "you don't get older, you only get better" applies to triathlon champion Dr Eddie King.

In the 1986 Iron Man triathlon "Tiffy" as he is known to his friends won in the record time of 7 hr 27 min 24 sec proving that he is one of the most outstanding endurance athletes in the world.

The Delmas doctor-dairy farmer likes nothing better than a challenge and this is why he took up "tri-ing" or "rubber-braining" in the first place.

He recently told *The Star*: "I watched the inaugural competition on television and saw the winner, Tim Cornish, looking so fresh and good, he was absolutely radiating energy and vitality. He then said in the interview that the triathlon would always favour the canoeists and said it would be many years before a specialist runner or cyclist won the event as canoeing was such a specialist sport.

"So immediately I had a point to prove and I had something to aim for."

Between 1969 and 1974 King represented Western Province at track and cross country. In preparation for the gruelling endurance events to come in the years ahead he notched up his best standard marathon time of 2 hr 22 mins at Stellenbosch in 1971.

In his debut triathlon in 1984 King finished fifth. Since then he has never looked back and added the 1985 and 1986 titles to his credits.

If you have any Iron Man ambitions be prepared to train almost non-stop. For Eddie King training has become a way of life — not only for himself but for his wife, Tertia, and baby daughter Louise as well.

Eddie has all the qualities needed for an endurance athlete. He is as lithe as whiplash, very determined when he has a set goal and pulls out all the stops when the going gets tough. These abilities are self-evident when you consider that he takes less than 7½ hours to cover 21 km of canoeing, 97 km of cycling and, finally, a 42,2 km standard marathon.

Triathlon stars must have understanding wives as Eddie readily admits. He told a newspaper reporter: "I've got a very special wife and I know for a fact that if it wasn't for her I wouldn't have come anywhere near to achieving what I've done so far."

There is no opportunity for a training rest. When one Iron Man competition is completed he starts training for the next one in a year's time. His maximum training is about 25 hours a week averaging out at about 20.

King manages to be a doctor, farmer, agricultural mechanic, husband, father, athlete and friend to many sportsmen around the country.

Tertia King believes the discipline of running the Delmas farm and Eddie's ability to function best under pressure have contributed to his triathlon successes.

"Whether you want to or not you have to start milking the cows at 6.30 am. Then there are many other responsibilities including managing the farm workers. Eddie is responsible for repairing anything that breaks — he is the family's handyman." In a recent interview Dr King spoke to the *Journal of the SA Sports Medicine Association* about his life, motivation, training methods and philosophy.

"I graduated from the medical school at the University of Cape Town in 1975 and then followed a varied career path. Utilising creative incompetence I started breeding American Holstein milk cows in the Delmas district. Little did I realise it then but I would also be part of a new craze called tri-ing or rubber-braining.

Nothing ever changes and all I want is to have lived well and to die well. As a teenager my father used to take me on hikes on his bushveld farm. I think he derived sadistic pleasure from reducing me to a physical and emotional wreck and allowing me to become totally disorientated and lost. Rounding each koppie he would say: 'The house is just around the next corner'.

Pushing yourself to the limit and then having to start all over again soon — this is part of the lunacy involved in

triathlons.

Training for the Iron Man competition is all sweat and no pleasure. Hearing Bruce Fordyce say that his training is enjoyable makes me very envious.

Starting to prepare for next year's event is usually the second day after this year's competition has been completed. Building up to 25 hours per week before the race demands sacrifice, compromises and a constant trade-off.

I try to peak about three months before the race doing six hour training sessions once a week. This comprises two hours paddling followed by 3 to 3½ hours of 90 km cycling and soon after that a 10 km run. Doing this totally alone forces one to depend on oneself. Towards the end of these sessions you feel like eating the grass on the side of the road. You hear skipping reels of rhyme flow through your brain: 'Jack be nimble, Jack be quick...' over and over again.

This got me very worried at one stage and instead I tried to memorise Hamlet. I kept sheets of prose under my cycling top just in case I forgot a line. But this can be very dangerous on a carbon fibre Vitus cycle at 40 km/hr.

The agony of such a long session really scares me although I try to experiment with pain by concentrating on different parts of my body, blotting out my environment as best I can. Mind bending is certainly a fair description of my enterprise.

When the pain becomes unbearable and the weariness draws me down, I have a dream or fantasy in which I am flying effortlessly. If we don't have dreams what is there left for us.

Competition: Competition at the top is certainly not between people but between individuals and the course. I have to conquer the elements; something like fire and ice. Fighting nature is more difficult and requires more imagination than beating people.

Perhaps to do 90 percent of my training alone in the wild, open spaces does it for me. At 37 I really can't compete physically with the eternal spring of youth and I think my forte has been reached. From now on the Springbok canoeists, cyclists and runners will have it more their own way.

Transcending pain of course is all important in these events. Experimenting with that pain and using it to one's own advantage — for instance masking fatigue (because they are not the same) — is exhilirating when achieved.

People often wonder why we subject ourselves to this physical and mental onslaught. As humans we are curious about just how far we can push ourselves. We do not do this for the television cameras or the feeling that after a race we have made love to thousands of spectators, but rather that we have bettered ourselves and pushed the boat a little bit further up the beach!

Training: Top world pro's like Molina, Scott and Tinley are doing 30 to 35 hours a week of intensive cardiovascular stress events — usually three events per day in three or more sessions — e.g. a 16 km easy run in the morning followed by an easy 90 km bike ride in the afternoon. Triathlons demand more from athletes than any other sport in the world.

I often do three events in one day, leaving the run for last; 10 km into the run I frequently get that high in the sky hypoglycaemia feeling and really have to concentrate on finishing the run. I never plan quality or anaerobic sessions. I do them only when I feel good or when my body allows me to.

The stress associated with the psychological build-up to an interval session is too much for me to handle and therefore I just let them happen — changing a long run into a Fartlek outing as my psyche allows. I believe that only ballet dancers train as hard as triathletes. We are truly aerobic death machines.

Age: 'The old order changeth, yielding place to new'. Certainly next year the younger guys will have it all their own way. But one should also not forget Carlos Lopes (37), the world marathon record-holder, and the wonderful Gary Player who is still winning veteran golf competitions.

Approach: "Psychology has really very little to do with triathletes as our brains become rubberised early on and such higher functions are neglected. Overtaking Springbok canoeist Rory Pennefather in 1985 at 30 km into the run I said: 'Rory, this is the final analysis; the circle is now complete.' This has no intended malice but seemed to have a staggering effect as was evident on television.

My great fear is that I may be selling my soul for glory. Remaining true to myself and my ideal is very difficult. Motivation is my greatest problem. Getting out of bed in the morning is extremely hard. The day gets easier as it goes on but the initial force needed to exit from the womb into the cold and hostile world of reality takes its toll every time.

It seems that there is a very close relationship between motivation and stress. They are certainly inversely proportional. In my daily activities as stress increases I find it harder to kindle the motivation so essential to proper training.

I divide stress into three — namely work, social and sport. When the people I work with in my medical practice don't understand my needs or pressurise me into longer hours my training always suffers. I feel that they don't seem to accept that one can do both well. For them success on the playing field necessitates poor work performance. Equating me with a full-time professional who does not have fixed employment hurts very much. Similarly family trauma of any kind leads to stress and that can have a negative effect on athletic performance.

I hasten to add that if it were not for my exceptional wife my sporting achievements would most certainly have amounted to nothing. She is the farm manager and carries the work pressures. At peak times I only eat and sleep at the farm.

Many authors seems to think that stress can have positive effects as well — but I have yet to become so enlightened.

Life for me is a trade-off between the essential things I have to do and my 3 to 3½ hours a day of training. How long my life will be so full I don't know.

Coming first is lovely but winning is the best, and in winning our lives as a whole count. Victory is a fickle thing — much like a woman's mind. It is always borrowed but never owned; elusive "'till the next race".

SCIENTIFIC PHYSICAL CONDITIONING FOR RUGBY

M C Siff, BSc Hons MSc Neuromuscular Research Laboratory, Physiology Department, University of the Witwatersrand, Johannesburg.

The need for rugby training to evolve from a traditional art to a definite blend of science and art is long overdue. Regrettably it has taken a great deal of adverse media publicity on the unacceptable extent of serious injuries to convince the rugby fraternity that training of players and coaches has to become far more scientific.

The expertise for establishing a scientific training methodology for rugby already exists in South Africa. There are outstanding exercise physiologists, sports doctors and experienced rugby strategists at institutions throughout this country, but fusion of their collected knowledge has not yet occurred. In addition, much relevant information may be extracted from the highly developed training systems used in American football and Soviet athletics.

Preliminary considerations

Among the most important factors required for establishment of scientific rugby training are the following:

1. Training must be a year-round process. An off-season lay-off followed by one to three months of intense pre-season training is a major reason for the generally low levels of fitness among our rugby players and the elevated incidence of injury during the early and late season periods.

2. Specialist coaches are required for the different components of rugby training. Very few single coaches are equipped to handle strategic skills, kicking skills, scrumming skills, strength training, psychological preparation, biomechanical analysis, fitness testing and rehabilitation routines. Just as there is a playing team, so there has to be an efficient coaching team comprising all relevant experts.

3. Scientific speed-strength training has to be incorporated into every player's programme. It is not possible to enhance significantly any player's strength and speed without supplementary gymnasium training using appropriate exercises sequenced carefully in terms of total volume, average load intensity and restoration intervals. As most gymnasium owners have no formal training in designing scientific supplementary conditioning routines, players should be provided with scientific programmes prepared by experts and supervised by accredited gym instructors.

4. Periodic scientific testing of the various components of player fitness is necessary. Ideally, a fitness screening session to test strength, speed, cardiovascular endurance and suppleness should be administered at the first practice of the season. Any player who fails this test should be excluded from official practices until he reaches an acceptable level of overall fitness.

5. Rugby training sessions must be devoted largely to enhancing technical and strategic skills, rather than to improving general physical fitness. Rugby players must acquire the necessary fitness in their own time and not waste an expert rugby coach's time in running physical training classes.

6. All players must learn the skills of running, falling, tackling and all aspects of ball-handling. Efficiency of play and protection from injury depends on acquiring high levels of neuromuscular skill in all types of movement encountered in rugby for instance, any team

all of whose players could drop-kick accurately, would have a formidable advantage over another team with a few specialist kickers.

Needs Analysis

An analysis of the specific fitness needs of forwards and backs is necessary for the design of a scientific training programme. Coaches need to understand the implications of the contributions played by the three distinct energy systems of the body (aerobic, lactic acid, anaerobic) and the major muscle-fibre types.

Too many coaches devote unnecessary and counter-productive effort to

in-season aerobic training, when it should be realized that the rugby player never relies predominantly on aerobic energy mechanisms. The benefits of aerobic training accrue during the off-season period. In season aerobic training can diminish strength, speed and agility, while increasing one's susceptibility to overtraining injury and stagnation.

An understanding of the rugby player's needs may be gained by analysing the time devoted to different events during the typical rugby match. A French study reveals the following statistics for the average game (1):

- There are 80 sequences of action lasting 27 minutes of actual playing time.
- There are an average of 40 scrums lasting up to a maximum of 20 seconds.
- Over 70% of rucks and mauls last five seconds and the remainder 6-10 seconds.

85% of all sequences last less than 20 seconds.
56% of all sequences last less than 10 seconds.
32% of all sequences last less than 5 seconds.

- All top club level forwards cover an average of 6 km; backs cover 4 km.
- 33% of the forward's distance is at top pace, whereas it is 50% for backs.

Since reliance on the aerobic system becomes dominant for sustained exercise lasting more than about 12 minutes (2) it is clear that rugby players, irrespective of position, require high levels of anaerobic and lactic acid system fitness. The main value of long-slow-distance (LSD) aerobic training lies in the off-season conditioning of tendons, ligaments and cardiovascular system to enable the player to cope with the in-season stresses of intensive interval and strength speed activity. Periodic low-value in-season aerobic sessions each lasting no more than 15 minutes assist in enhancing recuperation and maintaining an adequate level of cardiovascular fitness.

Periodisation

The overall long-term structuring of training to maximise performance to coincide with important matches is referred to as periodisation. Periodisation recognises the fact that there are three major phases of all training: preparation, competition, post-competition (or transition). The preparatory phase may be broken down further to general physical preparation (GPP) and specialised physical preparation (SPP).

GPP provides all-round physical conditioning in stamina, speed, strength, suppleness and the other basic components of fitness, while SPP concentrates on exercises which are more specific to the particular sport, such as scrumming and kicking proficiency in rugby.

Characteristically, the GPP phase may include participation in a variety of different or physical activities which provide low-intensity, all-round conditioning. Participation in social basketball and volleyball would be eminently suitable for the rugby player's GPP, especially in the transition period from GPP to SPP.

The volume of exercise should be high during GPP and its *intensity* low, then a gradual transition to SPP should occur, during which the exercise volume must decrease and its intensity must increase. At the same time, increasing emphasis should be laid on improving the techniques required by the specific sport.

The *gradual overload* principle is constantly adhered to through all training cycles to ensure that an adequate but not excessive increase in training stimulus is imposed on the body. Individual workouts should be alternated in terms of light, medium and heavy loading so as to ensure high efficiency for each match and maximum efficiency for the most important matches. Two successive heavy workouts should be avoided and no pre-match session should be too intense or too close to the match, unless it is devoted to light skills training.

Supercompensation

It should be remembered that any heavy loading temporarily exhausts the body's energy stores and causes a drop in strength, speed and endurance. However, within a few days, the body not only recovers but can actually over-recover or "supercompensate" to prepare the body for subsequent loading.

However, if a strenuous training session is imposed before sufficient recovery has occurred, supercompensation will be inhibited and overtraining, injury or depression may result. The player will be compelled to rest or train inefficiently so that his performance will fluctuate between unplanned highs and lows.

A similar, though safer situation will be produced if subsequent strenuous training is imposed well after recovery has occurred. Supercompensation will be minimal and performance will diminish gradually.

The maximum physical conditioning effect occurs if subsequent loading takes place between these two extreme situations, imposed regularly a short time before full recovery is complete. In addition, every three weeks of heavy training should be followed by a fourth week of low volume, sub-maximal training to maximise supercompensation. Efficiency of supercompensation can be enhanced by use of restoration measures including massage, active or passive rest, electrostimulation, saunas and similar physiotherapeutic techniques.

Speed-Strength Training

The rugby player is a contact sportsman who requires high levels of strength, speed and muscular endurance. Therefore, bodybuilding type training is of limited value to him, particularly if it includes no explosive movements. Some of the methods of Olympic weightlifting training are far more suitable for rugby training. In fact, American football, similar in many ways to rugby, requires all its players to perform heavy, low-repetition power cleans to improve overall power.

Bodybuilding and powerlifting training do not include phometric jumping exercises used by most American footballers to enhance the explosive power necessary for jumping, throwing, kicking and sprinting.

A properly designed speed-strength programme necessitates a balanced sequence of isometric, concentric and eccentric slow and explosive exercise regularly varied to prevent stagnation and injury. (3).

Structure of the Training Session

Each training session should be a miniature version of the periodisation system: preparation, loading, transition.

The preparation phase consists of a light general circulatory warming followed by general static flexibility manoeuvres and finally by specific flexibility procedures using static or PNF (proprioceptive neuromuscular facilitation) stretching to prepare specifically those muscle groups about to be used in the first exercise.

The gradual overload principle is applied in the loading phase, with each activity progressing from low to high intensity, with fewer repetitions being performed at high intensity. In the gymnasium, exercises are classified in terms of sets of a certain number of repetitions with a prescribed weight. On the rugby field sequences can be classified in terms of sets of a certain number of sprints, scrums and so on.

The concluding transition (post-training) phase consists of a gradual cooling-down period similar in structure to the initial warm up/general flexibility phase.

It can be particularly useful to integrate psychological preparation (such as motivation, technique visualisation, relaxation and ideomotor training) into the preparatory and concluding phases of every workout.

Selection of Supplementary Exercises

Exercises should be chosen to suit the needs of the individual so as to enhance his speed-strength performance, functional suppleness, general fitness for his specific rugby needs and his resistance to injury. Activities should never be permitted which are detrimental to performance or health.

Coaches need to be made aware of the fact that every exercise can be done incorrectly and that certain exercises are potentially harmful. For instance, many traditional movements such as leg raises, bunny hops, straight-legged sit-ups, hurdler's stretch, running with partner on the shoulders, toe touching, star-jumps, press-ups with sagging lower back and ballistic stretches can be dangerous for vital structures of the body including ligaments, joints and nerves (4).

Concluding remarks

The above information by no means covers the entire extensive field of scientific physical conditioning for rugby. It does not address the individual needs of forwards and backs, nor does it prescribe specific routines for strength or stamina. What it does attempt to do is introduce the relationship between rugby training and relevant physiological principles in an effort to increase awareness that scientific training can enhance performance and prevent injury.

WATER-SOLUBLE VITAMINS NOT SAFE IN MEGADOSES

The assumption that the water-soluble vitamins — B complex and vitamin C are non-toxic is inaccurate.

According to Carol Potera writing in *The Physician Sportsmedicine,* megadoses of B vitamins have been reported to cause peripheral neuropathies such as numbness, ataxia and paralysis.

Dr Robert O Voy, Chief Medical Officer and Director of Sports Medicine for the US Olympic Committee in Colarado Springs, United States, stated recently that although even severe cases of paralysis are usually reversable, he warned that "the symptoms can go on a long time before they are linked to a vitamin".

Added Potera: "B vitamins are known to produce other side effects. Ellen Coleman, a nutritionist at Riverside Cardiac Fitness in Riverside, Calafornia, described a runner who took 20 times the Recommended Daily Allowance (RDA) for niacin before a 10-kilometre race. "He was bright red and itching and scratching", added Coleman, because niacin is a vasodilator. She also said that thiamine megadoses have caused an anaphylactic shock.

In addition, two grams of vitamin C — the cold preventative dose — causes gastro-enteritis, diarrhoea, colitis, and kidney stones, according to Dr Voy. In some cases when the dose was suddenly stopped, rebound scurvy occured.

"What causes the side effects?" asked Potera. "At high doses, vitamins stop acting as vitamins and act instead as pharmacological agents. For example, the toxicity of vitamin B6 (pyridoxine) is probably related to its membership in the pyridine family, a group of neurotoxic drugs. Impurities in vitamin preparations could also be responsible. The Food and Drug Administration allows synthesised vitamins to have a two percent impurity level as long as the impurities are non-toxic at the RDA. But when taken in megadoses, the impurities can far exceed the limits of safety".

C Potera, *The Physician and Sportsmedicine,* Vol 14, No 3, March 1986.

HDL-C Concentration in Female Athletes

Serum high-density lipoprotein cholesterol (HDL-C) levels and percent HDL-C were significantly higher in nine female endurance runners, than in equal groups of female weight trainers and sedentary female controls, an American study has shown.

Weight trainers and controls showed no significant differences in HDL-C and percent HDL-C. Subjects who had higher HDL-C levels were more likely to be non-smokers who consumed little alcohol and did not use oral contraceptives.

No significant dose-response relationships were found for either runners or weight trainers when daily training duration, weekly training frequency, and weekly mileage were correlated with HDL-C. A cross-group comparison showed that females who were non-smokers, consumed low weekly amounts of alcohol, and did not use oral contraceptives had higher HDL-C levels. Differences in group HDL-C concentrations were associated with specific training methods.

D W Morgan, R J Cruise, B W Girardin, V Lutz-Schneider, D H Morgan and M Wang. *The Physician and Sportsmedicine,* Vol 14, No 3, March 1986.

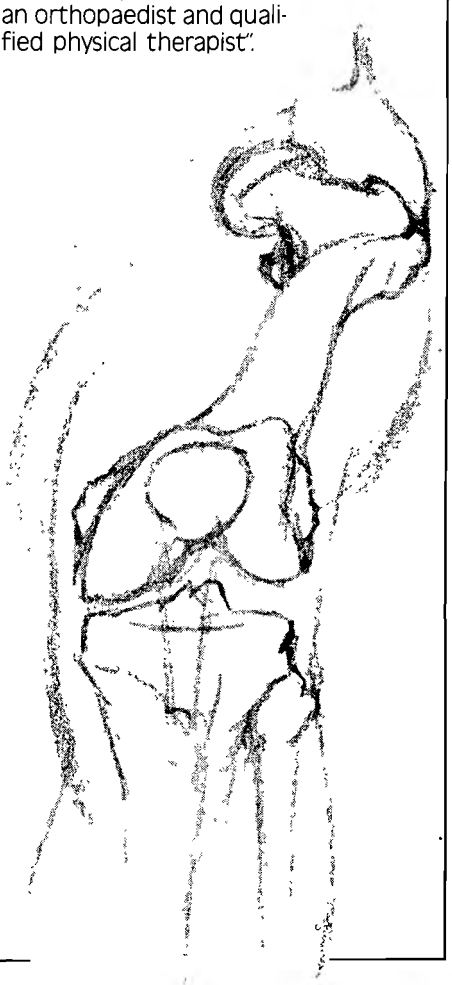
Treating Patellar Tendinitis

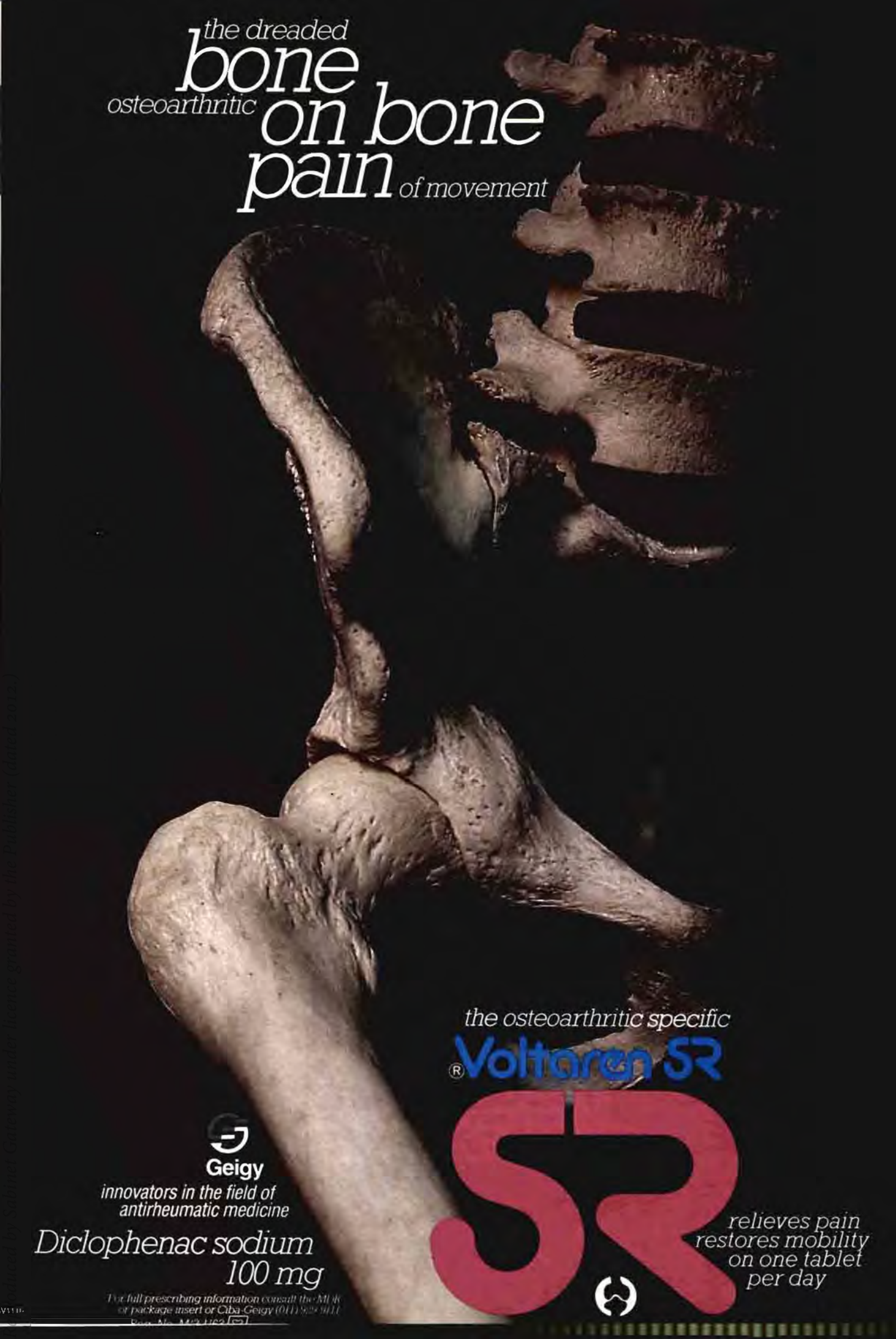
How serious is patellar tendinitis, also known as "jumpers' knee" (as is common in basketball players)?

Tennis trainer Bill Norris, advises *World Tennnis:* "Basically, you have an inflammation of the ligaments in the bottom half of your knee cap tendons, the patella. If your tendinitis is chronic, your knee is probably always sore, especially in the morning. The acute stage is marked by the skin feeling hot to the touch and may also be sore and stiff after heavy exercise."

He points out that the condition must be treated conservatively. Use ice-packs to reduce the temperature and swelling, and see a physical therapist or orthopaedist for galvanic, ultrasound or other electrical stimulation.

"If you have such treatments continuously — three or four days in a row — the blood supply to that area increases and the tendinitis is relieved", he adds. "On your own, try a whirlpool, hot baths or moist heat to help the circulation. Ask you physician about a patella brace: this band fits below the knee cap, reducing the pressure and allowing you to play with a minimum of pain. But once again, rest and treatment are crucial to recovery, as is a visit to an orthopaedist and qualified physical therapist".

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Learning to Play Tennis Without the Fear of Losing

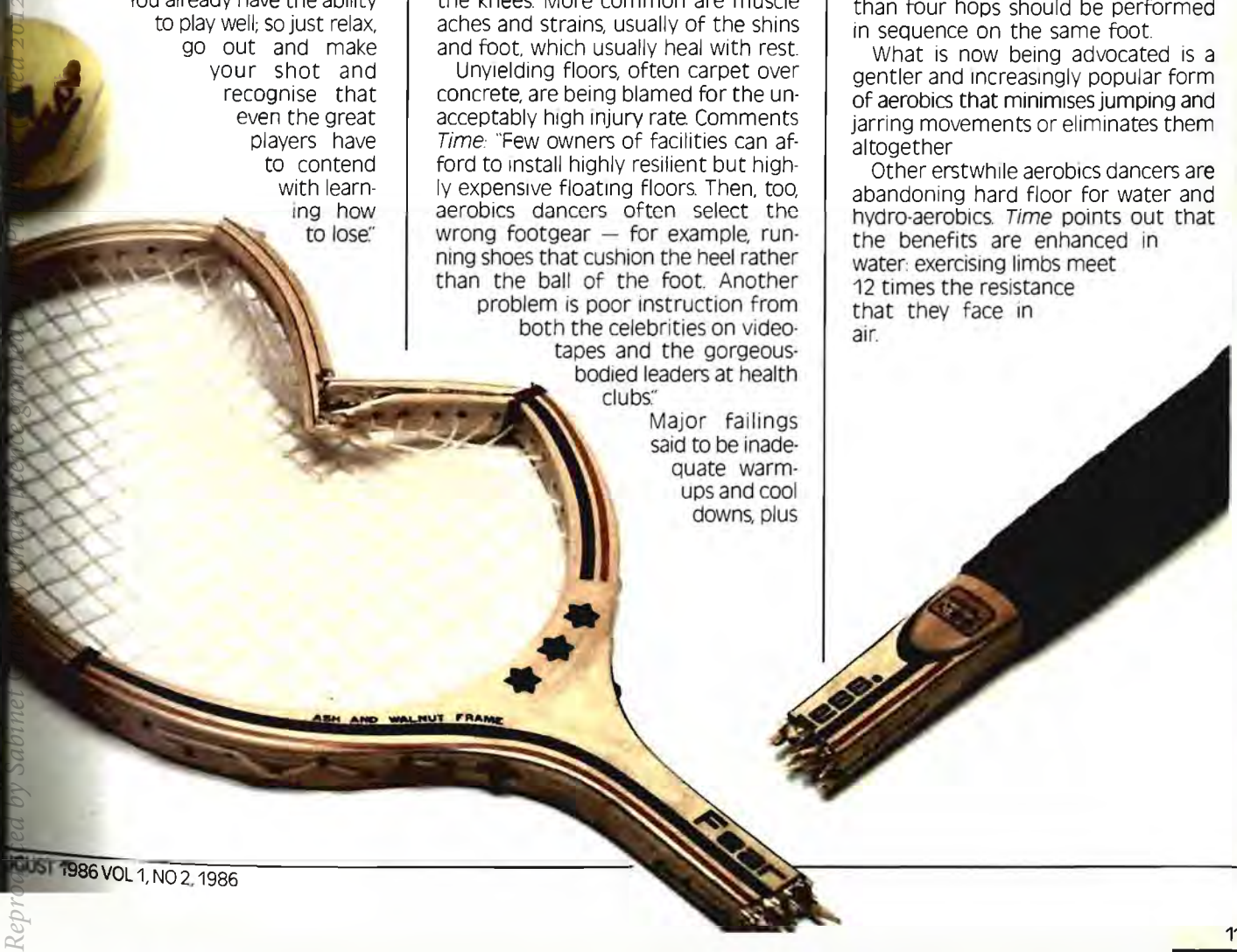
The secret of any game, the success of any game for a player, is to learn to play without the fear of losing.

"If you create the attitude that you are not afraid of losing, the worst thing that is going to happen is that you may have a bit of a sleepless night," says Pancho Gonzalez, writing in *World Tennis*. "A lot of players make too much of the problem: they can't sleep, can't rest, can't eat, can't have fun. That's supposed to be a disaster."

Gonzalez adds that if tennis has this effect on you, perhaps you shouldn't play the game — or you should switch to something else. Or perhaps you should stop playing games altogether.

"But if you realise that all of us get beaten and that it is part of the game — because without being beaten, there is no room for improvement — you will be more relaxed. When you are more relaxed and playing better, you will win.

"Of course, this is assuming that you are practising in the proper way during your training session. You already have the ability to play well; so just relax, go out and make your shot and recognise that even the great players have to contend with learning how to lose."



"High-impact" Aerobics May Be Hazardous to your Health

American exercise authorities are recognising that "high-impact" aerobics can prove hazardous to students and instructors alike.

According to *Time* magazine a recent survey of 1200 students showed that 43 percent had suffered injuries. Among 58 teachers the figure was an alarming 76 percent. Other studies show similar results.

Few of the complaints seem to involve serious damage to the back or the knees. More common are muscle aches and strains, usually of the shins and foot, which usually heal with rest.

Unyielding floors, often carpet over concrete, are being blamed for the unacceptably high injury rate. Comments *Time*: "Few owners of facilities can afford to install highly resilient but highly expensive floating floors. Then, too, aerobics dancers often select the wrong footgear — for example, running shoes that cushion the heel rather than the ball of the foot. Another problem is poor instruction from both the celebrities on videotapes and the gorgeous-bodied leaders at health clubs."

Major failings said to be inadequate warm-ups and cool downs, plus unflagging exhortations to do more, push harder and "go for the burn".

Peter Francis, a biomechanics researcher at San Diego University, maintains that an aerobics dancer lands with a force equal to three times her weight. "On slow-motion tape you see a rippling of the skin. That's just indicative of the shock wave travelling up the body."

The American College of Obstetricians and Gynaecologists is concerned about potential dangers and is recommending changes. The college urged less intense workouts and issued guidelines for the average exerciser.

Time reports that heart rate should not exceed 75 percent of the recommended maximum; classes should be no more frequent than every other day; the aerobics portion should be limited to 30 minutes; and no more than four hops should be performed in sequence on the same foot.

What is now being advocated is a gentler and increasingly popular form of aerobics that minimises jumping and jarring movements or eliminates them altogether.

Other erstwhile aerobics dancers are abandoning hard floor for water and hydro-aerobics. *Time* points out that the benefits are enhanced in water: exercising limbs meet 12 times the resistance that they face in air.

POTENTIAL PSYCHOLOGICAL DANGERS OF JOGGING

Timothy D Noakes MB ChB MD Metropolitan Sports Science Centre, Department of Physiology, University of Cape Town Medical School and author of *Lore of Running* (Oxford University Press)

As the running revolution of the late 1970s took hold and as the literature describing its benefits grew, it was only natural that a counter-literature should develop. The major contention of this counter-movement is that running is detrimental because it is "addictive". For the remainder of this chapter we will consider the arguments surrounding this running "addiction".

One definition states that addiction occurs when involvement in an activity eliminates choice in all areas of life. On this basis, an addiction must be distinguished from a habit, commitment or compulsion, none of which exclude all other activities. My experience is that the great majority of runners are not addicted to the extent that running completely dominates all aspects of their lives. Rather, I believe their running fits the description of a compulsion and the term addiction is inappropriate.

It should also be noted that society is selective in its judgement of compulsions. As James Fixx (1977) has noted: "No one uses the word addiction when referring to people who spend inordinate amounts of time making money, playing at politics, or pursuing the opposite sex." Activities which Fixx suggests may be even more hazardous than "spending a quiet hour or two in a park or on a country road". But we should not allow Fixx's masterful English to disguise the possibility that running in a park for up to two hours a day could in fact be as much a behaviour disorder as is working twelve or more hours a day.

A feature of an addictive state is that withdrawal symptoms develop when the addict cannot partake of his addiction. Two authors have described the withdrawal symptoms which they consider indicative of running's addictive nature. Psychologist William Morgan (1979), lists the following array of withdrawal symptoms: "... Depression and anxiety are usually accompanied by restlessness, insomnia and generalised fatigue. Tics, muscle tension and soreness, decreased appetite and constipation or irregularity often develop. In general, the benefits of vigorous exercise are reversed... The scheduled daily run pre-empts important vocational and social commitments, causing work, family and friendships to suffer. In fact addictive runners may totally alter their lifestyles to accommodate the priority of their running interest; this may involve changes in diet, clothing, choice of friends and even career."

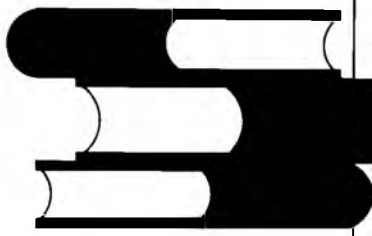
Michael Sacks (1981) notes that the running addiction usually starts during a period of increased emotional stress. In this regard, running is especially attractive as it is in an easy skill to acquire and therefore provides a simple rapid solution to emotional distress.

So powerful is this addiction that another writer has suggested that the United States Congress should enact legislation requiring the following warning to be displayed on all running shoes, shorts or books:

WARNING: The Psychiatrist General has determined that jogging and running are hazardous to mental health and present a grave risk of contracting contagious quasirandomous wanderitis (QW) or "jogging about".

Sacks has emphasised particularly the psychological component of these withdrawal symptoms: "The running addict is characterised by a compulsive need to run at least once sometimes twice a day... if prevented from running, such runners become... preoccupied with guilty thoughts about how the body will decondition or deteriorate in some way. The running addict recognises the irrationality of those feelings and thoughts, but they are inescapable and can be relieved only by running."

With this background, let us consider the arguments for and against this "running addiction" in more detail. **Turn to page 20**



Executive Stress by Donald Norfolk, Arrow Books

Stress, like nuclear energy, can be a power for good or a power for ill. The careers of many people are being cut short — by nervous breakdowns, heart attacks and the aptly named "executive burnout syndrome" — because they have not learned the secrets of stress management.

Others, meanwhile are carrying out rich and exciting lives by harnessing the energising powers of stress arousal. Learning the basic survival tactics outlined in this book can make the difference between success and failure.

There have been many recent developments in the field of stress research, which have been incorporated in the second edition of this book.

Everybody is under some stress each day of their lives — whether from job worries, domestic crises, financial troubles or plain anxiety about the future. Yet Norfolk maintains that stress can be a vital, positive force for enriching life and helping people realise their full potential.

In this revised edition the author explains how to recognise the danger signals of too much stress — and how to harness this immensely potent force for your own benefit.

The British publication *The Economist* called *Executive Stress* "a wise and vigorous handbook "for the individual who wants to come to terms with stress and to harness its positive aspects. This is a sensible book which can be read with profit not only by the harassed executive but by those who feel that the world is too much with them."

Commented the *Executive Post*: "The book is informative and gives sound helpful advice in a very readable narrative style... Its forte is its clear, lucid style and its sound, practical advice".

Running Without Fear by Dr Kenneth H Cooper, Bantam Books

Since the death of running guru Jim Fixx, the dangers of exercise have been hotly debated.

In his latest book Dr Cooper, an aerobic expert and Director of the Cooper Clinic and Aerobics Centre in Dallas, provides guidelines for his safe approach to exercise, along with explanations of the various risks involved.

The author writes that what we face today is widespread confusion and ignorance about exactly what exercise can or can't do. In *Running Without Fear,* he clears away the confusion and tries to set the record straight.

"Exercise is absolutely essential to good health. It is the cornerstone for any complete effort to reduce the risk of heart attack and sudden death. It is also a major key to an energetic, long life", he states. "Above all I want to provide you with solid grounds to feel totally confident as you fit aerobic exercise into your own approach to good health and longer life. I want to show you how you can continue to run, swim, cycle, or dance and get the maximum health benefits of that aerobic activity without fear."

Dr Cooper offers guidelines on:

- How to reduce the 11 "rules of risk" for developing heart disease
- The danger and fallacy of the myth of invulnerability: that the more we exercise; the healthier we are
- What constitutes a safe and effective stress test — plus the new Cooper Protocol, the state of the art procedure in stress testing developed at the Institute for Aerobic Research
- Why the cool-down is the most dangerous phase of exercise
- How to avoid the Jim Fixx Syndrome
- How, when, and where you are at risk during exercise
- How to develop your own personalised and safe exercise programme
- Complete with illustrations, charts, self-evaluation tests, references, glossary and index.

It is easy to see why *The Physician and Sportsmedicine* magazine commented: "Many very good commonsense recommendations for specific aerobic exercises, with emphasis on safety". This book is helpful for the general public... and valuable for physicians.

Being Human — A Day in the Life of the Human Body by David Bondanis, Century Publishing Company.

In tracing the course of a day in the body's life this book transports us to an extraordinary inner world of electric nerve impluses, tensing muscles, pumping chemicals and racing cells.

The author, David Bodanis, describes movement, eating, anger, pain, desire, sex, contraception, relaxation, sleep and many other processes that might occur in an ordinary day. He writes with the vividness and clarity of a thriller writer.

Magical moments are highlighted — like the development of a heart in a four-weeks-old foetus — and more bizarre phenomenon such as the mites that live in the spaces around the base of the eyelashes, shaped like crocodiles and with eight legs and wriggly bodies. Lavishly illustrated with unique photographs, *Being Human* is truely fascinating.

Tendinitis: It's Etiology and Treatment by Sandra Curwin and William D Stanish, Collier MacMillan International.

Tendinitis: It's Etiology and Treatment is a compact and readable volume which covers tendon structure and function; the etiology, pathology and mechanics of tendinitis; tendon healing, and the role of exercise in treating the disorder.

While focusing on the forms of tendinitis that are most common (Achilles tendinitis, jumper's knee, tennis elbow), it also describes the other less frequently encountered forms (shoulder, elbow, wrist, groin, hamstrings, shin), including signs and symptoms and tips for differential diagnosis.

It presents a unique programme of exercises, describes how it is applied to the various types of tendinitis, and surveys the results of 200 cases in which the programme was used. A concise yet thorough approach, combined with a careful review of the clinical literature and presentation of a clinically proven exercise programme, makes this an extremely useful book for physicians, therapists, trainers, coaches and athletes.

SPORT INJURY REHABILITATION PROGRAMME
CIBA-GEIGY

Final Phase Rehabilitation of Sports Injuries and the Role of Isokinetic Testing

Dr. Etresia Prinsloo (MB ChB)
Project Leader: Ciba-Geigy Sport Injuries Rehabilitation Project, Institute for Sports Research and Training, University of Pretoria

Dr. Etresia Prinsloo, the author of this article, photographed in her laboratory with Springbok rugby captain Naas Botha.

No patient with a sports injury should resume his sport before being functionally rehabilitated — this could prevent re-injury to a great extent.

The purpose of functional rehabilitation is to regain the following:

1. Functional muscle power
2. Cardiovascular fitness
3. Muscle endurance
4. Co-ordination and balance for sport specific activities
5. Suppleness.

The handling of a sports injury requires a multi-disciplinary rehabilitation team. The members include: the patient, doctor, physiotherapist, biokineticist and trainer.

The injury may be divided into 5 phases, viz:

1. the prophylactic phase
2. the injury and first-aid phase
3. the treatment phase
4. the primary rehabilitation phase
5. the secondary rehabilitation phase.

The physiotherapist is responsible for the very important primary rehabilitation phase. This phase starts as soon as possible after injury, e.g. while still in bed after surgery or immediately after a soft tissue injury. The physiotherapist helps the patient regain his kinetic function. Once the patient is able to move without pain the rehabilitation programme continues. Now follows secondary rehabilitation during which the patient must be rehabilitated functionally. This phase falls under the biokineticists — in conjunction with the physiotherapist and trainer.

The principles of functional rehabilitation are:

1. Evaluating the patient repeatedly to monitor progress
2. Exercising within pain limits
3. Progressively increasing resistance at which exercise takes place.

An isokinetic test apparatus is extremely valuable in repeatedly evaluating a patient to monitor progresss. In knee injuries the first evaluation may for example be done when the knee is able to flex 90° without pain. Various centres in the country are in possession of an isokinetic test apparatus, e.g. 1 Military Hospital, Institute for Sport Research and Training (University of Pretoria), University of the Orange Free State, University of Stellenbosch and University of Port Elizabeth.

The Cybex is an example of an isokinetic dynamometer — this apparatus is used to keep the speed at which a movement is executed constant while the resistance changes continually. The muscle is under maximum load at each point in the extent of the movement. However, when the patient is moving slower than the determined speed, no resistance is experienced. The apparatus is therefore completely accommodating for pain and exhaustion. It is impossible for the patient to injure himself while being tested, because the less power he uses, the less the resistance.

Everyday activities are carried out at an angular speed of 60°/sec while high intensity sports activities take place at 240 – 300°/sec. The speed at which a patient is tested, is thus determined by his requirements.

The Cybex is designed to test 16 movement patterns, viz:

shoulder – flexion/extension
– ab/adduction
– horizontal ab/adduction
– internal and external rotation at 90° abduction

Sources
1. Ros S. and Irvin R. *Sports Medicine* New Jersey, Prentice Hall, Inc. 1983.
2. Gellers I. F. *Rehabilitasie van Sportbeserings.* "Nasorg" Sport Bulletin, Oct. 1983.
3. Nicki V. *Orthopedic Rehabilitation.*
4. *A Handbook for Using the Cybex Data Reduction Computer.*
5. Piret P. *Rehabilitation of knee injuries.* S.A. Sportgeneeskunde, Dec/1 8, 1981.
6. Strydom G. L. *Sportbeserings.* Potchefstroom: Potchefstroom Herald (Pvt) Ltd., 1978.

SPORT INJURY REHABILITATION PROGRAMME
CIBA-GEIGY

elbow – flexion/extension
forearm – pronation/supination
wrist – flexion/extension
– radial/ulnary deviation
hip – flexion/extension
– ab/adduction
– internal/external rotation
knee – flexion/extension
tibia – internal/external rotation
ankle – plantar/dorsiflexion with knee 90° flexion
– plantar/dorsiflexion with knee 0° flexion
– in/evertion.

The following values can be determined for each of the movement patterns and are valuable in drawing up an exercise programme:

1. maximum torsion
2. total effort
3. power per kg body mass
4. extent of movement
5. balance between antagonist muscle groups

The injured limb is compared to the sound limb and may not differ from it by more than 7%, or the patient is not ready to resume his sport yet. The injured limb should, however, preferably be strengthened until it is somewhat stronger than the sound limb.

An exercise programme to be followed in a gymnasium under proper supervision is given on the basis of the above results.

The patient should always exercise *within pain limits*. If he experiences any pain or swelling, the resistance and/or extent of movement should be reduced. However, if no pain or swelling is experienced, *resistance* at which movement takes place during isotonic exercise should be *progressively increased* with every exercise session.

All the muscles in an injured limb must be exercised, e.g. in knee injury the hip flexors and extensors, ab- and adductors as well as the gastrocnemius and soleus should be strengthened together with the quadriceps and hampese. The hampese usually heals quicker than the quadriceps. A flexing programme for the hampese, quadriceps, groin muscles, gastrocnemius and soleus should also be given.

Considerable attention should be paid to proprioception and co-ordination. The patient with an injury of the lower limb should initially exercise on a balancing board, and where the injury allows it, he should use a skipping rope. At the very end of the rehabilitation programme he could start jogging on a small trampoline.

Sports specific activities should also be started at the end of the programme.

When the injured limb is 20% weaker than the sound one, the patient can start running on a straight, even surface. Later, when he can achieve it without pain or swelling, he can start running faster for stretches, and later he can start 45° turns, and after that 90° turns and figure 8's. When he can carry out all these activities without pain, the patient is rehabilitated as far as humanly possible and is able to resume his sport.

Above right: The tremendous exertion which is required to measure maximum muscle load is clearly illustrated on the face of Springbok rugby captain, Naas Botha.

Above left: A typical sports injury which can be fully rehabilitated after treatment has been completed.

INTERNATIONAL SPEAKERS FOR 1987 CONGRESS

In this journal you will find the announcement of the second South African Sports Medicine Congress to be held at the Heerengracht Hotel, Cape Town, from April 14 to 16 1987.

The preliminary programme is outlined, as well as some of the prominent overseas speakers that have already accepted invitations to participate in our congress. Please complete the intention form if you are interested in attending the congress, also if you intend to read a paper on a relevant subject.

There has been tremendous support — both local and overseas — for the 1987 congress. In the light of the quality of the internationally renowned speakers who have already accepted invitations, the organisers have every reason to believe that the congress will be a great success.

Tydens die onlangse besoek van die SASGV aan 'n sporttroumatologiekongres in München, Duitsland, was ons begroet met ongekende entoesiasme van die buiteland vir die bywoning van ons kongres. Gesien in die lig van die uiters gunstige wisselkoers van die oorsese geldeenhede teenoor die Suid-Afrikaanse rand, is Suid-Afrika tans 'n paradys vir die oorsese toeris. Kaapstad bly 'n groot aantrekkingskrag vir enige besoeker en die weer tydens April belooof ook om baie gunstig te wees — alles faktore wat 'n besoek aan Kaapstad die moeite werd sal maak.

Die organiseerders reël ook 'n baie interessante damesprogram wat dit die moeite werd sal maak vir afgevaardiges om hulle metgeselle saam te bring na die moederstad. Die offisiële dinee gaan gepaard met 'n dansvertoning wat baie mooi aansluit by die tema van die tweede dag van die kongresverrigtinge.

Verdere toeligting insake die kongres sal in die tydskrif verskyn en gestuur word aan diegene wat die voornemevormpie terugstuur.

SPORTS MEDICINE

Continuing Education Course — Provisional Programme Presented by the SA Sports Medicine Association.

Venue: Bozzoli Hall, University of the Witwatersrand 8–9 August 1986

FRIDAY 8 AUGUST

08.00–08.40	**Registration**
08.40–08.50	Welcome: SASMA President
08.50–09.10	Diet and the sportsman
09.10–09.30	Drugs and sport
09.30–09.50	Strength and fitness for sport
09.50–10.10	Energy utilisation and fluid balance in marathon running
10.10–10.30	Heat injury and sport
10.30–10.50	Cardiac prehabilitation
10.50–11.00	**Discussion**
11.00–11.10	**Tea**
11.10–11.30	Cardiac rehabilitation
11.30–11.50	Heart disease and the sportsman
11.50–12.10	Psychiatry and sport
12.10–12.20	**Discussion**
12.20–12.40	Film: Heart
12.40–13.00	**Lunch**
13.00–13.20	Foot biomechanics
13.20–13.40	Ankle injuries (soft tissue)
13.40–14.00	Shin splints and other shin pain
14.00–14.20	Meniscal injuries
14.20–14.40	Anterior cruciate instability
14.40–15.00	Patello femoral injuries
15.00–15.10	**Discussion**
15.10–15.30	Film: Injury
15.30–15.40	**Tea**
	A.G.M. SASMA
	DINNER: FRIDAY EVENING

SATURDAY 9 AUGUST 1986

09.00–09.20	Lumbar disc pathology
09.20–09.40	Shoulder injuries
09.40–10.00	Elbow injuries
10.00–10.20	Hand and wrist injuries
10.20–10.40	**Discussion**
10.40–10.50	**Tea**
10.50–11.10	Sports injuries in the child
11.10–11.30	Sport and the pregnant woman
11.30–11.50	Physiotherapy of running injuries
11.50–12.10	Rehabilitation of knee injuries
12.10–12.30	Rehabilitation of muscle injuries
12.30–12.40	**Discussion**

Speakers:
Speakers invited to present papers include: Dr C Noble, Dr T Noakes, Brig E Hugo and Dr R Morris.

Registration:
Registration: R120 per person for the course. Send personal details and registration fees to: Mrs A Schuster, P.O. Box 55539, Northlands 2116.

Supported by Ciba-Geigy (Pty) Ltd

PHYSIOTHERAPY AND THE LONG-DISTANCE RUNNER

Clive H, Lipinski BSc (Physiotherapy)
who has completed both the Comrades Marathon and Iron Man Triathlon.

Introduction:

It is not uncommon that physiotherapists are sent referrals by medical practitioners asking for heat, short wave diathermy and infra red all in the same prescription, and this being directed towards the treatment of a sports related injury.

I am fortunate in that at least 80% of my patients are sports people. In this article I propose to outline the role of the "sports" physiotherapist in both the treatment and management of the long-distance runner.

My definition of a "sports" physiotherapist is one that has an adequate knowledge of the sport i.e. training and competing as well as adequate equipment for both the acute management of the injury and for the later rehabilitation of the sportsman back to competitive sport.

Role of the Sports Physiotherapist and the Long Distance Runner

Often the first person the runner consults regarding his injury is the physiotherapist. I feel there is a variety of reasons for this:

Firstly, a fellow runner may have been treated by the physiotherapist and recommended him, and secondly, the runner is afraid that his doctor does not see too many athletes and may tell him to rest.

It is thus essential that the physiotherapist can accurately assess the runner's problem, after obtaining permission from the runner's doctor. The runner is liable to exaggerate the symptoms and thus, both accurate joint and soft tissue examinations must be done by the physiotherapist.

Let's now look at the complete treatment given to the long distance runner, presuming the diagnosis has already been established.

1. Advice (General)

More often than not the runner has been given no advice by the medical practitioner regarding the injury. He may, for example, know that he has a torn hamstring but that is about all. It is the physiotherapist's responsibility to inform the runner about the mechanism of the injury, the methods of self treatment of the injury e.g. ice packs, and the preventative measures that can be used.

It may also be necessary here to advise the runner about the correct way to stretch. It may also be necessary to inform him about correct strengthening to facilitate the injury healing and to prevent a recurrence.

> ***"I also find it advantageous to watch the runner in motion, both with and without his shoes on. "It will show whether the runner has excessive subtalar pronation or supination."***

2. Foot and Shoe Assessment

It is also essential that the physiotherapist be able to find the neutral position of the runner's foot in weight bearing and then examine for abnormalities.

I also find it advantageous to watch the runner in motion, both with and without his shoes on.

It will show whether the runner has excessive subtalar pronation or supination. I also use it to assess the medial rotation of the tibia in midstance phase together with patella displacement.

Shoe assessment forms a large part of the "complete treatment programme". Often the runner is about to embark on buying a new pair of shoes (average cost R135) and because of his previous and most probably present injury wants to buy the shoe that is most correct for his particular need.

It is essential that the physiotherapist examine older pairs of shoes to gauge running patterns.

The shoe that the physiotherapist prescribes or advises to the runner must be correct for both the runner's style; weight; distance that he wants to run and terrain that he wants to run on.

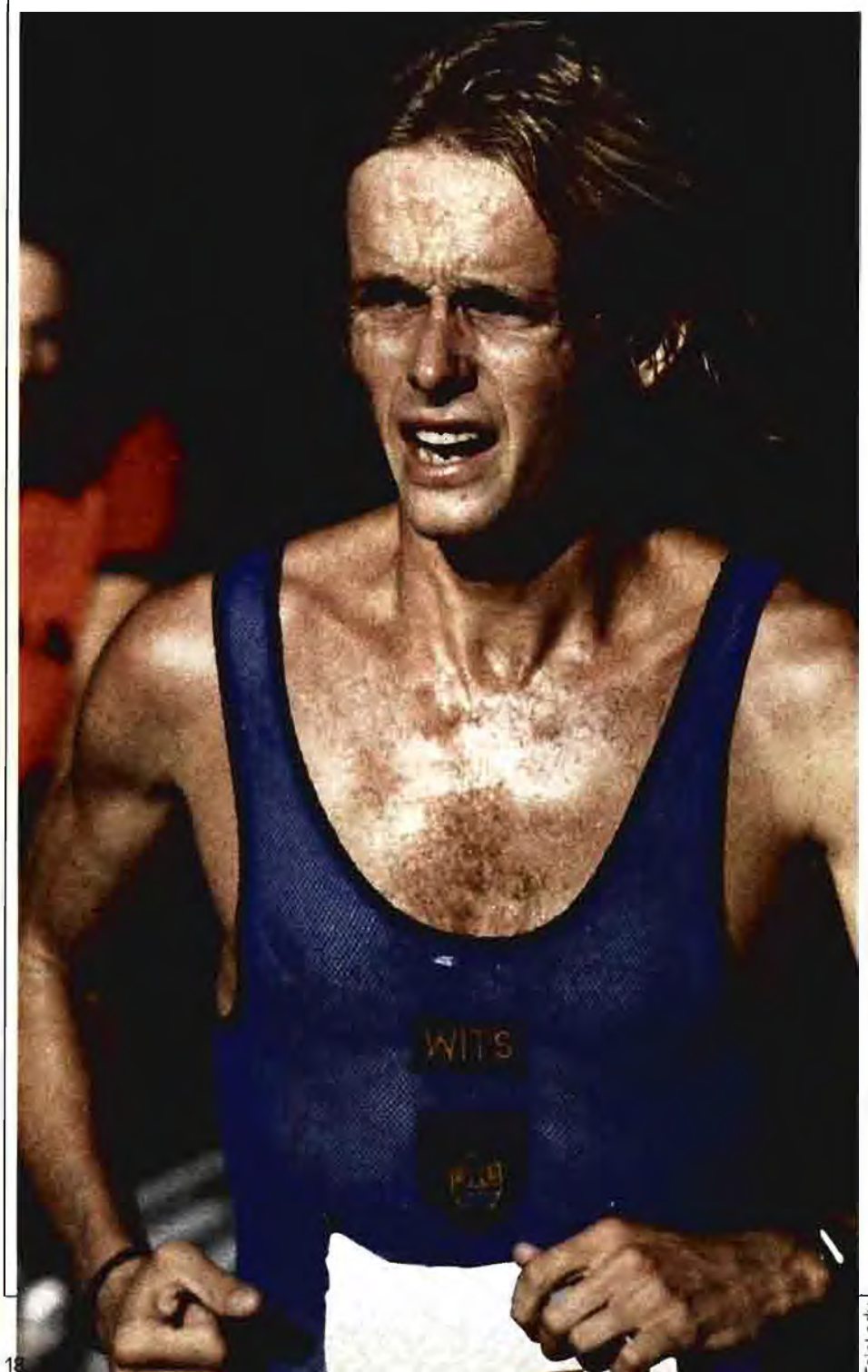
Training Guidance

The greatest fear is the severity of the injury. He is never quite sure when to resume training, how much he should be doing when he does resume training and on what surface he should run on.

It is thus important that the physiotherapist understand the nature and biomechanics of the injury so that correct advice as to training can be given. The physiotherapist should take into account the hardness of the terrain, the camber of the road and the topography before setting out a training programme.

When treating South African long-distance runners that are Comrades Marathon orientated, their injuries tend to be of severe overuse.

The physiotherapist treating the runner must know how to reduce the runner's distance to assist the injury healing, but at the same time must bear in mind the fact that the runner has to have completed sufficiently long runs so that he can complete the race. It must also be remembered that the runner who attempts the Comrades Marathon is a very serious, committed person.



"Those at the back have all kinds of things on their minds. They dream of the houses they're building and the fight they had with their wives — anything to take their minds off the agony they're going through. But some of the front runners are a pretty odd lot too. I guess we're all a little mad."

BRUCE FORDYCE.

A sudden severe decrease in running mileage could affect his whole psychological approach to the race. When a runner does need to stop running completely, e.g. in the case of a stress fracture, it is necessary for the physiotherapist to recommend alternative methods of training. I usually suggest the runner train in a swimming pool — by suspending himself with a life jacket or such and then running on the spot, his feet off the pool surface. The buoyancy of the water supports the stress fracture and the action simulates normal training. I also put the runner on a weight training programme that does not interfere with the injury.

On the Spot Assessment

When dealing with highly competitive long-distance runners, their injury may sometimes only be elicited while running. Thus it is very difficult to accurately find the site of injury. At this stage the physiotherapist should go out and run with the runner so as to accurately locate the injury site as well as assess the movement that is causing pain. If the above is not possible, I usually advise the runner to go out on a gentle run and mark the painful area with a pen.

I find it important that he does not palpate the area of pain, but simply marks it with his pen. He should also note when the pain occurs and what increased or eased it. All this assists the physiotherapist in a more accurate assessment and treatment of the injury.

Treatment of the Injury

As can be noted from steps one to four there has been no mention of the physical treatment of the injury. It is only now that the physical "hands on" treatment of the injury should begin. I believe that although the diagnosis has been established by the doctor, the actual modalities and methods of treatment should be left to the physiotherapist.

Machinery and methods of dealing with running injuries and sports injuries as a whole are dynamic. Machines such as interferential therapy; Curapuls (pulsed short wave diathermy); diadynamic current and infra red laser are the more modern modalities available to the sports physiotherapists together with the more established ultra sonic therapy.

Equipment such as the Orthotron allow for isokinetic strengthening, and Nautilus allows for a mixture between isokinetic and isotonic strengthening.

The treatment of choice has become vigorous, deep cross frictions of the injured muscle — as opposed to a gentle relaxing massage.

When treating running injuries, the acute management by the physiotherapist involves the stopping of bleeding into the affected area, the reduction of inflammation and or oedema and pain relief. This is usually achieved by electrotherapy modalities, anti-gravity positioning and home advice.

Once the injury has passed the acute phase, the physiotherapist must now examine whether there has been loss of strength in the limb due to the injury. Often an injury to the soft tissues leaves the runner with less flexibility and this the physiotherapist must assess and correct where necessary.

The progression of the runner back to full training during the injury phase must be gradual and well monitored by the physiotherapist.

Although I usually completely curtail training only in three instances — namely — stress fractures, tendonitis with crepitus and severe muscle ruptures, I do however alter the runner's programme.

This usually involves a decrease in distance, altering the pace, and a change of running environment and sometimes a change of terrain. I find that keeping the runner mobile throughout his injury, helps him cope physiologically and also assists me in my subjective examination during the following treatments.

Conclusion:

No longer does a physiotherapist simply "rub" away the sports injury. The approach towards the management and treatment of running injuries has become dynamic and aggressive.

The argument for a "running addiction"

The biochemical argument

This argument contends that running is addictive because it stimulates the release of certain hormones inside the brain, the endorphins or enkephalins, which give the runner a pleasurable feeling while he is jogging — the so-called runner's high (Callen, 1983). The brain then becomes dependent on these pleasure-producing substances just as it does to other potentially-addictive substances like heroin, cocaine, or morphine. But, like all addictions, the euphoric feelings can only be maintained if the dosage (i.e. running distance) is continually increased.

The psychological argument

Other writers have noted that the withdrawal symptoms described by runners who are forced to stop running for a period of time are mainly of a psychological, rather than a physical nature. The psychological withdrawal symptoms that they describe include guilt, irritability, anxiety, tension, restlessness and depression. These writers also note that runners like myself tend to lay rather too much emphasis on the mental benefits of running and suggest that this may indicate that such addicted runners use their running to cope with major underlying psychological problems. Victor Altshul (1981) suggests that if jogging is indeed able to mask anxiety and depression, as these runners testify, albeit for relatively short periods, then it follows that many people with these psychological abnormalities will use running as an effective and cheap home-remedy.

Like Sacks, Altshul also notes that compulsive running frequently starts in response to a major emotional upheaval. "My impression... is that if... a lean athletic man is consciously or unconsciously contemplating divorce, there is at least a 75% chance that he is or will be a compulsive runner. Thus, I would claim not that running causes divorce, but rather that divorce, among other forms of human misery, causes running."

A number of abnormal psychological states possibly present in addicted runners are described below:

i) Primary affective disorder

Apparent evidence for the postulate that running might attract persons more likely to suffer from anxiety or depression comes from a study by a New York Physician, Dr Edward Colt and his colleagues (1981). In a group of sixty-one runners who were participating primarily in a study of their physiology not their psychology, he found a high incidence of what is termed "primary affective disorder". Persons with this condition suffer from more anxiety and depression than is considered normal, and frequently require psychiatric assistance, including psychotherapy. Amongst the group were some élite athletes who also showed this disorder.

Colt concludes that this data indeed suggest that running may be particularly rewarding for those runners with affective disorders. He also noted that some runners said they became "revved up" after very intensive training sessions and these workouts were frequently followed by insomnia. These symptoms, which I have certainly experienced, are said to indicate "hypomania". One question that Colt suggests needs to be answered is what happens to competitive athletes when they retire from competition? Do they become depressed? If so he asks, could this explain those suicides that occur in retired athletes?

ii) The athletic neurotic

Psychological dependence on running may occur not only because it helps control primary affective disorders, but also because it may provide an essential coping mechanism for those who have a neurotic fear of illness. Some indication for this was first provided by a Leeds psychiatrist, Dr Crawford Little (1969), in a paper that went largely unnoticed prior to the current interest in running addiction.

Little noted that amongst patients referred to him for the treatment of neurosis, 42% were completely unathletic; they showed not the slightest interest in any form of physical activity. However, 39% were the precise opposite. These "athletic neurotics" seemed to over-value the importance of health and fitness and revealed an "inordinate pride" in their previous sickness-free progress through life and in their excess physical stamina, strength or skill.

Subsequently, Little has concluded (1981) that athletic neurosis is not a trivial, short-lived illness. He suggests that while excessive athleticism is not in itself neurotic, because it does not cause any suffering in either the subject or his family, it can place the subject in a vulnerable pre-neurotic state, leading to manifest neurosis in the event of an appropriate threat. Despite this, Little considers that the overall benefits of the exercise movement of the 1980s far outweigh the small danger that some athletic neurotics will be produced.

Since re-reading Little's article, I have become more aware of the athletic neurotics. One recent example was the 45-year-old man who wanted to know whether or not he should take anabolic steroids to improve his muscle bulk and strength. My suggestion that, at his age, he shouldn't still be so vain was quite clearly inappropriate, as his athletic neurosis demanded that he go to inordinate ends to insure that he did not become weak.

iii) The obsessive-compulsive athlete

In its extreme form, "obsessive-compulsive" behaviour is characterised by a rigid, intensely focused attitude; preoccupation with technical detail; over-reliance on intellectuality with a loss of emotional responsiveness; worry and marked self-criticism; over-concern for moral and professional responsibility, with emphasis on what *should* be done; and constant routine activity performed with the use of a schedule and checklists.

Running is attractive to the obsessive-compulsive because it provides a rigidly defined goal (such as running the Comrades Marathon) which justifies a constant, routine activity (training) and preoccupation with detail (training methods, diet, shoes, reading this book, etc).

(To be cont. in Vol. 1 No. 3 1986)