Biomedicine

Kathy A. Fackelmann reports from Washington, D.C., at the 47th annual meeting of the American Academy of Dermatology

Rise in skin cancer rates reported

New data show that more people than ever before are getting melanoma, the most serious form of skin cancer.

"The growth in the number of cases since 1980 has been 93 percent in the United States," says Darrell S. Rigel of the New York University Medical School in New York City. While some scientists believe the rise is a statistical artifact due to increased early diagnosis of the disease, Rigel's data indicate there are simply more melanoma cases—and the problem is not restricted to the United States. "This rate of increase is roughly the same as the rate found in 21 studies in 16 other nations," Rigel notes.

Those blistering, peeling burns that beachgoers got from unprotected sun exposure in the 1960s and 1970s may be part of the problem. Doctors believe melanoma is caused not by chronic sun exposure but by binge sunbathing. In the United States, a person who gets one blistering sunburn in his or her 20s is three times more likely to develop melanoma than one who has never had a bad burn, Rigel says.

Indeed, doctors report seeing younger and younger patients with melanoma. In the past the disease was rarely seen in patients younger than 40; now doctors are getting many patients in their 20s and 30s.

The trend could worsen if the ozone layer continues to be depleted, Rigel notes. The thin layer of ozone in the stratosphere protects Earth's inhabitants from damaging ultraviolet radiation present in natural sunlight. But increasing releases of chlorofluorocarbon compounds, chemicals used in refrigerators, apparently have damaged the ozone shield.

Melanoma is one of the most lethal forms of cancer, Rigel says, noting that it is almost always fatal if it spreads to other parts of the body. But doctors have a high success rate if they catch the disease early enough. "If you catch a melanoma early and remove it, it's 100 percent cured," Rigel says. He suggests patients use lots of sunscreen and see their doctor if they notice a speckled mole that has an irregular shape.

Another research team suggests the type of sunscreen used may be important. Elizabeth Knobler and her colleagues at Columbia Presbyterian Medical Center in New York City report that benzophenone, a chemical used in certain sunblock lotions, may cause an allergic reaction triggered by light. Knobler's group saw four patients who broke out into a rash after they had applied suntan lotion and were exposed to the sun. The problem can be dangerous, she says, because patients may think the rash is due solely to sun exposure and so may apply more suntan lotion. Consumers should test products on a small patch of skin to see if they react to the chemicals, Knobler suggests.

Skin injuries: Bane of the sporting life

In French it's known as "talon noir." In English it's called "black heel." This black-and-blue skin discoloration afflicting joggers is just one of many skin conditions that can plague sports enthusiasts, reports Rodney S. Basler at the University of Nebraska Medical Center in Omaha. Black heel is caused by the shearing friction of the runner's shoe. It is harmless and goes away when the running stops. The condition also shows up in golfers as "black palm," Basler says.

For riders of that next big wave, a condition called "surfer's nodule" is common. Basler says the bumps, which appear on the foot and are regarded as a badge of distinction among serious surfers, result from long hours spent in contact with a surfboard.

Tennis buffs may develop "tennis toe," a painful condition caused when the toes are abruptly jammed into the end of the shoe. Skiers and joggers also may get this injury. Basler's prescription: Shoes with enough room to wriggle your toes.

Computers

Deep Thought for winning chess

The computer Deep Thought has earned the highest chess rating yet achieved by a machine, putting it in the top ranks of all chess players. Built and programmed by a team of graduate students at Carnegie Mellon University in Pittsburgh, Deep Thought last month also tied for first place in a major chess tournament featuring some of the top human chess players in the United States.

Deep Thought is a direct descendant of Chiptest, an experimental machine that last year won the North American computer chess championship (SN: 11/21/87, p.335). Developed by Feng-Hsiung Hsu and Thomas Anantharaman and their collaborators, Deep Thought consists of two Chiptest processors. It incorporates a new searching algorithm known as "singular extension," which allows the machine to probe deeper along promising tracks rather than stay with a general search. By replaying completed games backwards, the machine uses hindsight to learn from its mistakes. Nevertheless, it has trouble generalizing its new knowledge to situations that are similar but not identical to chess positions already encountered.

In the world of chess, Deep Thought has now earned a rating of roughly 2545, putting it at the grandmaster level. The world champion has a rating of more than 2700. By maintaining a rating of more than 2500 for 25 consecutive games, Deep Thought qualifies for the $10,000 Fredkin intermediate prize awarded to the first machine achieving a grandmaster rating.

Deep Thought's principal computer rival is another Carnegie Mellon chess machine named Hitech, developed by computer scientist and chess expert Hans Berliner and graduate student Carl Ebeling. Hitech, which has a rating just over 2400, doesn't search as deeply or as intelligently as Deep Thought, but tries to make up for this drawback by incorporating more chess knowledge to guide its play. Hitech is particularly good at recognizing special chess patterns.

In the only meeting between Deep Thought and Hitech, during this year's North American computer chess championship, Deep Thought won and went on to capture the title. Hitech lost two games in that tournament. The computer happened to encounter chess positions it didn't really understand, says Murray Campbell, who has worked on both Hitech and Deep Thought. "It knew it was winning, but it didn't know how to win and ended up losing."

Hitech, however, played superbly last September in an exhibition match against grandmaster and former U.S. champion Arnold Denker. Winning three games and drawing one, Hitech became the first chess computer to beat a human player ranked as high as a grandmaster. In last month's tournament, Deep Thought also defeated one player at the grandmaster level but lost to another – its only loss in the tournament.

Hsu and his group now plan to put together an eight-processor version of Deep Thought, further increasing the chess computer's speed and capabilities. However, even in its present form, Deep Thought gets the respect of its human opponents, who sometimes term its play surprisingly creative.

"The seemingly creative behavior of this computer leads one to speculate whether or not there are other human endeavors in which creativity could be simulated by a clever, fast search," comments Carnegie Mellon computer scientist Daniel D. Sleator.

In their efforts to build and program chess-playing computers, researchers are also learning new things about the game itself. Systematic studies of how to end chess games when both players have only two or three pieces on the board have already revealed many flaws in conventional wisdom. Chess computers running through published games are also finding errors in many books describing various game openings.