Electrons Fly as Computer Chess Champ Crowned

The confrontation was classic: the undefeated, veteran champion, sporting a new look but somehow still set in its old ways; the cocky newcomer, relying on speed and fresh ideas to slip into the top; and the comeback kid, seeking to regain the title that its parent once held. When the electrons finally settled, the world had a new computer chess champion. CRAY BLITZ had used its superior speed to figure its way into first place, defeating the defending champion, Belle. NUCHESS, whose predecessor, CHESS 4.6, won the title in 1977, was ousted.

The Fourth World Computer Chess Tournament, held earlier this week in New York at the Association for Computing Machinery annual meeting, featured 22 of the world's best chess-playing computers. A midtown Manhattan hotel ballroom provided the stage for about a dozen of the computers, glowing green and occasionally emitting insistent beeps as they played. Other programs relied on telephone links to central computers as far away as Germany. The cost of nightly, four-hour conversations mounted steadily throughout the tournament's five rounds.

From the beginning, attention focused on NUCHESS, CRAY BLITZ and Belle, representing AT&T Bell Laboratories (SN: 10/8/83, p. 236). In the opening round, the larger, faster computer programs easily brushed aside the weaker players. Yet, even chess programs running on IBM personal computers played brilliantly at times, although they faded in torturous end games when the larger computers could peer much farther ahead. Microcomputers specially designed to play chess also made a stronger-than-expected showing.

In the third round, NUCHESS met Belle, and tournament observers saw a major surprise. After building a strong position, Belle seemed to lose the game's thread, blundered, and the advantage shifted to NUCHESS. Nevertheless, NUCHESS also made moves that its designer, David Slate of Northwestern University in Evanston, Ill., could describe only as "one of those random events in the universe," and the game remained in doubt. In the end, NUCHESS forced Belle into its first loss since 1978 at a computer chess tournament. Ironically, the U.S. Chess Federation has just recognized Belle as the first computer to achieve a national master rating. Later, the climactic fourth-round match between NUCHESS and CRAY BLITZ ended in a draw.

Great Britain's David Levy, an international chess master and computer programmer, had expected Belle to win all its games. Noting that betting on a computer chess match is usually foolhardy, he commented, "Chess is a complex game where fine judgments are required. Computers are often not able to make these judgments." Many times, a game may be decided by a seemingly innocuous move that eventually reveals itself as a colossal mistake, he said.

For many of the participants, the tournament was a testing ground for new programming ideas and for potential commercial products, including chess-playing machines and programs for personal computers. For instance, Robert Hyatt of the University of Southern Mississippi in Hattiesburg, largely responsible for CRAY BLITZ, tested a new method for allocating time intervals between moves. One surprise was the success of AWIT from the University of Alberta in Edmonton, which used artificial intelligence methods instead of an exhaustive search, for evaluating positions and moves.

Levy, who has in the past consistently beaten the leading chess-playing computers, commented that this time he would be hard pressed to beat the new champion, CRAY BLITZ. —*I. Peterson*

Nuclear accident that kills one is attributed to human error

Osvaldo Rogulich, a technician with 14 years experience, was attempting to perform a routine reconfiguration of the Argentine research reactor's fuel for a physics experiment. He had performed this precise task before. This time, however, something went wrong. There was a bright blue flash lasting a few thousandths of a second. Immediately Rogulich realized that he had initiated an uncontrolled nuclear chain reaction—in technical parlance, a prompt-criticality excursion. The time was 4:10 p.m., Sept. 23. Forty-seven hours later, Rogulich was dead.

Shortly after the accident occurred, the Argentine government cabled the International Atomic Energy Agency (IAEA) in Vienna with a description of what happened at the tiny, zero-power RA-2 reactor in Costituyentes (near Buenos Aires). As the IAEA now puts it: "There were serious operator errors."

Had the water moderator, which slows down fission neutrons, been drained completely from the reactor, the accident could not have occurred, U.S. analysts note, because in this type of reactor, all fissioning would stop. But Rogulich did not remove the water. He also failed to remove two cases of fuel from the reactor, and instead unloaded them behind the reactor's graphite reflector (a wall surrounding the reactor core, and used to reflect, back to the core, neutrons that might otherwise escape). Finally, Rogulich made "a slight mistake in the final [fuel] configuration," an Argentine report explains.

Why an experienced operator would make such basic mistakes has stymied nuclear analysts in this country for weeks. The answer, offered for the first time last week by the Argentine embassy, is disquieting. As José Maria Otegui, First Secretary and a nuclear specialist at the embassy, explained: "It was a 'Friday afternoon accident.'" Rogulich, lucid until shortly before he died, told officials that in a hurry to get home, he shortcut safety procedures. "He was so self-confident," Otegui said, "he thought he could determine which of them were unnecessary."

Unfortunately for Rogulich, the laws of physics are unforgiving. Though the reactor and fuel were unharmed (automatic safety systems at once drained the reactor's water), Rogulich received 1,400 rads of neutron radiation and 400 rads of gamma. He died of radiation-induced pneumonitis and was developing radiation-related gastrointestinal syndrome. Because Rogulich is one of only a handful of persons ever to receive such a high dose, a detailed account of the progression of his symptoms should contribute to a better understanding of acute radiation effects in humans. —*J. Raloff*

Three guilty of fraud

A federal jury last week found three former officials of Industrial Bio-Test Laboratories (IBT) in Northbrook, Ill., guilty of multiple counts of fraud. The verdicts result from falsified data or misstatements regarding the lab's safety tests on four products—the antibacterial agent trichlorocarbanilide (used in soaps), the herbicide Sencor, pesticide Nemacur, and arthritis drug Naprosyn. (Other tests eventually confirmed each product's safety.) IBT was among the largest independent chemical-testing firms until federal audits showed hundreds of its more than 4,000 safety tests to be invalid (SN: 7/4/81, p. 121). Guilty are: Moreno Keplinger, IBT's former toxicology manager; James Plank, its former assistant toxicology manager; and Paul Wright, formerly of IBT's rat-toxicology program. IBT founder Joseph Calandra, also charged with fraud, was granted a mistrial in July when hospitalized for heart surgery. □

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