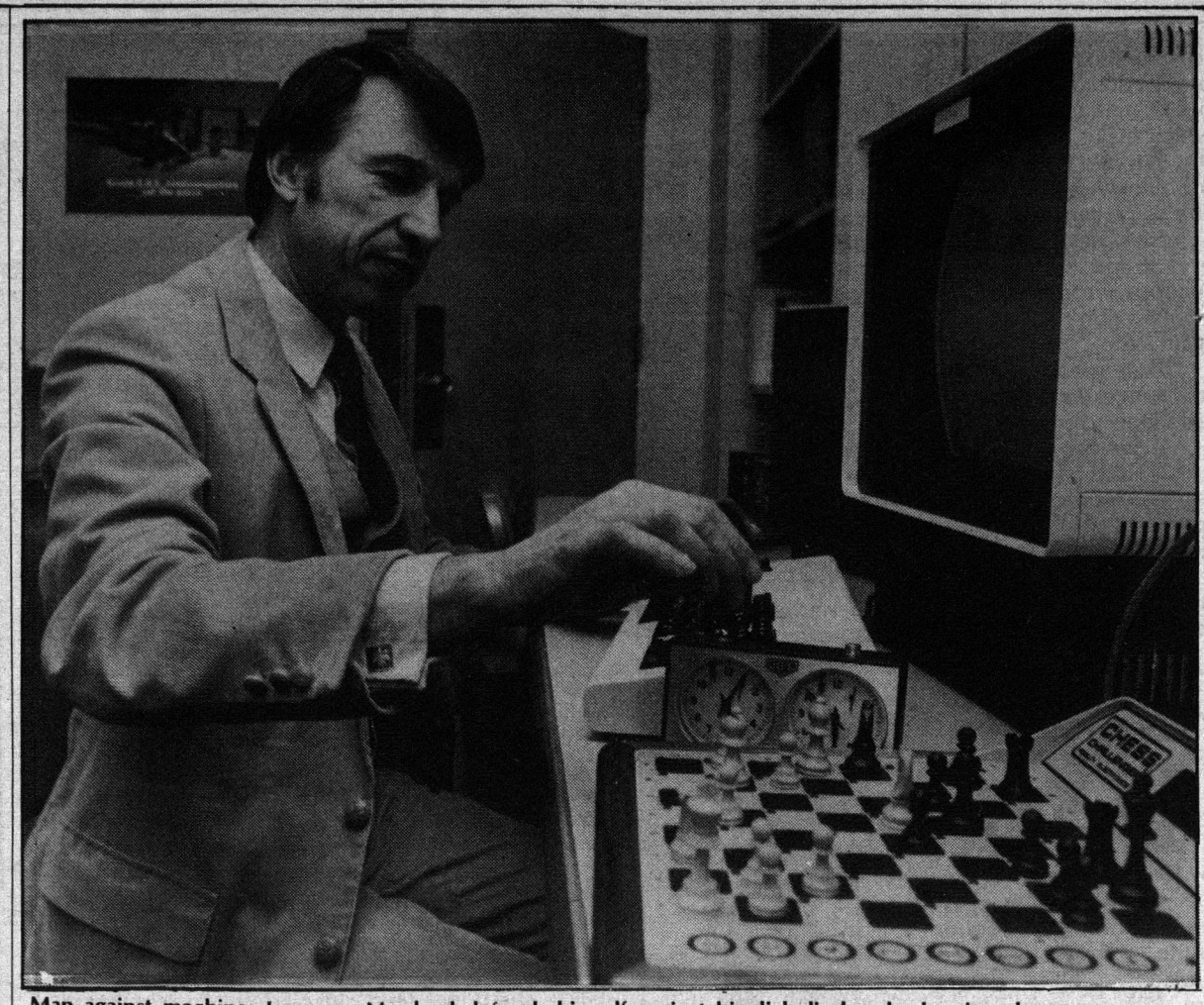

photo Bill Inglee

Man against machine: Dr. Tony Marsland defends himself against his diabolical and scheming chess computers.

Humans still chess champs

continued from page 1

The obvious disadvantage is that if the program discards something it should not have, it will fail to see potentially fatal consequences.

The process has been likened to playing with half a mind or with one eye closed.

In 1970 *Awit* earned a banner headline in the *New York Times:* "Computer loses in king-sized blunder."

But *Awit* has had its successes. In addition to its good showing in New York last month, the program managed to tie for first place with two humans at the Edmonton Summer Open this year.

"...one problem programs always have when they face a human is the lack of a killer instinct."

"It plays a tournament twice or three times a year," says Marsland. He says that one problem programs always have when they face a human is the lack of a "killer instinct."

But "ordinary humans don't play computers very often and don't know the weaknesses. It's like when a stranger comes to town," says Marsland.

With exposure the computer becomes predictable.

It is for this reason that Marsland does not play against *Awit*. "I can manipulate it... I know its capabilities and weaknesses too well."

Another major disadvantage of the selective search type of programming is that these programs are very difficult to write. Marsland has been working on *Awit* for twelve years.

It is much easier to tell the computer to consider every possible move than to try and write in intricate themes and strategies.

It is because exhaustive search programs are so small that they are found in all home chess computers.

It only makes sense to have the computer do as much, and the programmer do as little as possible. This may be the most important reason for selective search programs falling out of favour.

Also exhaustive search programs have the ability to think while the other player is making his move.

All things considered, "the best programs are exhaustive search," says Marsland.

At the October world championship, an American exhaustive search program, *Belle*, was recognized by the US Chess Federation as the first program to attain a US Master rating.

Essentially making better exhaustive search programming is a matter of employing bigger and faster computers.

Presently computers play chess quite rapidly. At most tournaments a "forty moves in two hours" time limit is enforced. Championship matches between humans can last for days.

But the amount of computing necessary to make better moves increases exponentially.

If the time limit were extended to three hours, there would be little difference. Says Marsland, "you would need something like twenty hours for a noticeable difference."

Similarly, a computer would have to be several times bigger or faster to make use of a program much better than the ones currently in use.

"I believe it is possible to build an exhaustive search program that can play on the Grand Master level," says Marsland, "but I don't know when.

Nor is the research and energy being devoted to writing chess programs all fun and games.

The game of chess, which involves some fundamental principles of logic, can be used as a test bed for discovering things about computer programming in general.

Marsland has already developed a distributed chess program. Distributed programs involve more than one computer working together to solve the same problem.

"We've had as many as six (computers) connected," he says. In this way valuable information can be gained about the control of distributed computers.

"The playing of chess is not the point. It's getting them all to work together - it's experimental computer science," says Marsland.

"I believe it's possible to build an exhaustive search program that can play on the Grand Master level..."

Another aspect of computing which Marsland is interested in is advisory systems.

In an advisory system, a computer works in tandem with a human.

"Humans are quite good at decisions but they are careless," says Marsland. "If the human has made a simple mistake, the computer can recognize it."

Advisory systems could be used to control industrial processes. Marsland uses the example of mixing paint. The human could be responsible for basic decisions and programming basic information into the computer which in turn would be responsible for "preventing the wrong colour from being mixed."

In this way one man could monitor a complex industrial process.

Marsland has successfully used *Awit* in an advisory role while playing chess by mail.