

# Starstruck: Kids wowed by astronomy wizard



Dr. Clyde Tombaugh was still in high school on his family's Kansas wheat farm in the 1920s when he began making sketches of planets he observed through a home-made telescope.

By Pat Murphy  
staff writer

About 700 students in Wayne County had a rare opportunity to meet with the man credited with discovering the planet Pluto.

Dr. Clyde W. Tombaugh, 82, was the main attraction at a one-day meeting in November at Bentley High School in Livonia. The meeting was put together by the Wayne County Math and Science Council, an informal group of teachers, with help from entities like the Livonia School District and the Michigan Department of Education.

State officials cited Tombaugh's appearance as an excellent example of learning by doing.

"Teachers and students had the chance to meet with somebody of extreme stature," said M. Cherie Cornick, consultant to the Michigan Department of Education.

They got the chance to ask questions and hear what he had to offer. They followed up with small workshops where youngsters could do some hands-on experiments. Most had to do with astronomy, but some of the workshops dealt with other earth sciences.

Tombaugh was remarkable, said Richard B. Braun, science coordinator for Livonia schools.

SCIENCE TEXTBOOKS note that Tombaugh was still in high school on his family's wheat farm in Kansas in the 1920s when he began making sketches of planets he observed through a home-made telescope. Some of those sketches were detailed enough to include the polar caps of Mars and the moons of Jupiter.

When Tombaugh sent some of his sketches to the Lowell Observatory for comment, officials responded by offering him a job.

Tombaugh was hired in 1929 — without first being interviewed, according to reference books — to con-

science: an educational MELTDOWN



Fourth-grader Danielle Sockolowski said she enjoyed Tombaugh's discussion of how comets are similar in makeup to a "dirty snowball."

tinue the search for an undiscovered planet whose existence was predicted by Sir Percival Lowell, the English astronomer who died in 1916.

Lowell had observed some irregularities in the orbit of neighboring Neptune and hypothesized that the

perturbations were caused by gravity of a large object nearby, possibly an undiscovered planet.

Tombaugh estimated that he observed and photographed some 90 million stars using the calculations of Lowell before discovering the planet in February of 1930.

The discovery was heralded as a triumph for the process of discovery by prediction. It was announced in March 1930, in conjunction with the 75th anniversary of the birth of Percival Lowell and the discovery of the planet Uranus.

TOMBAUGH KNEW he was making history and reportedly told colleagues that he intentionally looked at his watch so he could later declare that Pluto was discovered at "a few minutes of 4 p.m." on Feb. 18, 1930.

The astronomer talked about the discovery to groups of youngsters, answering questions as young minds were stimulated. One group, fourth graders from Cass Elementary in Livonia, made the following observations about meeting with Tombaugh and the accompanying workshops.

Tombaugh talked about building his first telescope (about six feet long), said Greg Hnatuk. "His next telescope was about two stories high."

Nancy Staffend said Tombaugh discussed how the orbits of Pluto and Neptune would change. "He (Tombaugh) put a lot of time and effort into finding Pluto," she said. "That shows that hard work pays off."

Danielle Sockolowski said she enjoyed Tombaugh's discussion about the composition of comets, and how comets are similar in makeup to a "dirty snowball."

Steve Saab said he enjoyed Tombaugh and the discussions on astronomy. But he also enjoyed the workshop he attended because he and others could touch and handle beads, snakes and lizards.

## Ford's better idea: encourage careers in science

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would make at a hamburger stand," Bombback said. "We're expanding the program this year to include seven teachers (who will earn about \$2,850 for six weeks)."

Summer interns are selected from those who participate in Saturday classes and are recommended by their teachers. "We're interested in those students motivated enough to roll out of bed on their day off," said Bombback. "We also require a 2,500-

word paper on one of the topics we covered at the Saturday classes during the year."

Some Ford staff personnel were initially skeptical about the students, Bombback said. "They were concerned about the added work and responsibility. But after seeing what the students could do, those same people were looking for ways to keep them on."

Hollanoe A. Holdeman, a senior at John Glenn High School in West-

land, is a former intern who now works about 12 hours a week at the Ford Engineering and Research Center.

BOTH THE intern program and the part-time jobs give students "a look at real-life science," said Holdeman.

At her part-time job Holdeman, who will study civil engineering under a joint program sponsored by Central Michigan University and

Michigan Technological University, works with a cryo-ultramicrotome to slice polymer for analysis under a transmission electron microscope.

She slices polymer, a plastic-like synthetic, to about 1/100th the width of a human hair or piece of paper, Holdeman said. Samples are then put under the microscope that transmits electrons through the polymer for analysis of the internal

structure, she explained.

"It's demanding work," said her boss, H. Kiel Plummer, research scientist. "It's tedious and demands patience and attention to detail. I believe about one in 100 students could do that work."

While the ultimate goal is to encourage students to go into science or engineering, Bombback said there is more immediate gratification.

"There's the reward of seeing somebody's face when the light goes on and they begin to see what it's all about. It's very rewarding."

Not every student responds as openly, Bombback said. "Some students take notes like crazy while others don't seem to be interested. But they come back time after time. We just hope some of what we're doing rubs off."

## Science bewilders adults, too

National and international report cards suggest that students are scientifically illiterate.

But public opinion polls suggest their ignorance may be reflective of a general lack of scientific knowledge among the public.

A 1985 survey by the Public Opinion Laboratory at Northern Illinois University, for example, reported that more than 400 adults, or about 21 percent of those responding, said the sun revolves around the earth.

About 7 percent, or 140 respondents, said they didn't know.

Other findings reported from that survey include:

- Some 39 percent of the adults questioned said they thought astrology is scientific. About 7 percent said they sometimes change their plans after reading their horoscopes.

- About 41 percent of the adults responding agreed with the statement, "Rocket launchings and other space activities have caused changes in our weather."

- About 43 percent of adults agreed with the statement, "It is likely that some of the unidentified flying objects that have been reported are really space vehicles from other civilizations."

- About 29 percent of the adults

questioned responded "true," when asked if lasers work by focusing sound waves.

All of the above statements are false.

The lack of science knowledge is also evident among groups that are supposedly educated. In response to a questionnaire mailed by an Oberlin College biology professor to newspaper editors, only 51 percent said they disagreed strongly with the statement: "Dinosaurs and humans lived contemporaneously." Some 37 percent said they agreed or had no opinion.

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