

Los Angeles Times

CIRCULATION:

1,225,189 DAILY / 1,514,096 SUNDAY

MONDAY, JUNE 18, 1990

COPYRIGHT 1990/THE TIMES MIRROR COMPANY / CC1/98 PAGES

COLUMN ONE

AIDS—a Funding Backlash

■ There appears to be a growing resentment over the preferred status given the disease. Congress may be reluctant to maintain that special treatment.

By MARLENE CIMONS
TIMES STAFF WRITER

WASHINGTON—Jean McGuire, an accomplished AIDS policy lobbyist, is accustomed to a Congress that has been extraordinarily willing in recent years to approve dramatic increases in AIDS spending.

So she was more than a little startled during a recent Capitol Hill visit to hear the following comment from a key Senate appropriations official:

"You know," said the aide, who works for the labor-health and human services subcommittee, chaired by Sen. Tom Harkin (D-Iowa), "there are many times more people in Iowa who are living with Alzheimer's than are living with

Fund-Raising Is Important Part of Mandela Visit

By TRACY WILKINSON
and EDWIN CHEN
TIMES STAFF WRITERS

If Nelson Mandela's tour of the United States goes as organizers hope, not only will the black South African leader deliver his anti-apartheid message to huge audiences nationwide, he also will raise several million dollars to pay for the trip and help fund political and social work back home.

Money is very much a part of Mandela's 12-day, eight-city U.S. tour, which gets under way Wednesday when he arrives in New York and ends in California on July 1.

The coast-to-coast trip will incur some mighty
Please see TOUR, A18

U.S. Military Leaves Toxic Trail Overseas



Agence France-

An army officer argues with protesters in Bucharest's University Square in an effort to get them to le

New Protests

Science / Medicine

■ **Computers:** The technology that designs better cars now may do the same for replacement teeth. It may mean lower costs and more convenience for patients.

By IRENE WIELAWSKI
TIMES STAFF WRITER

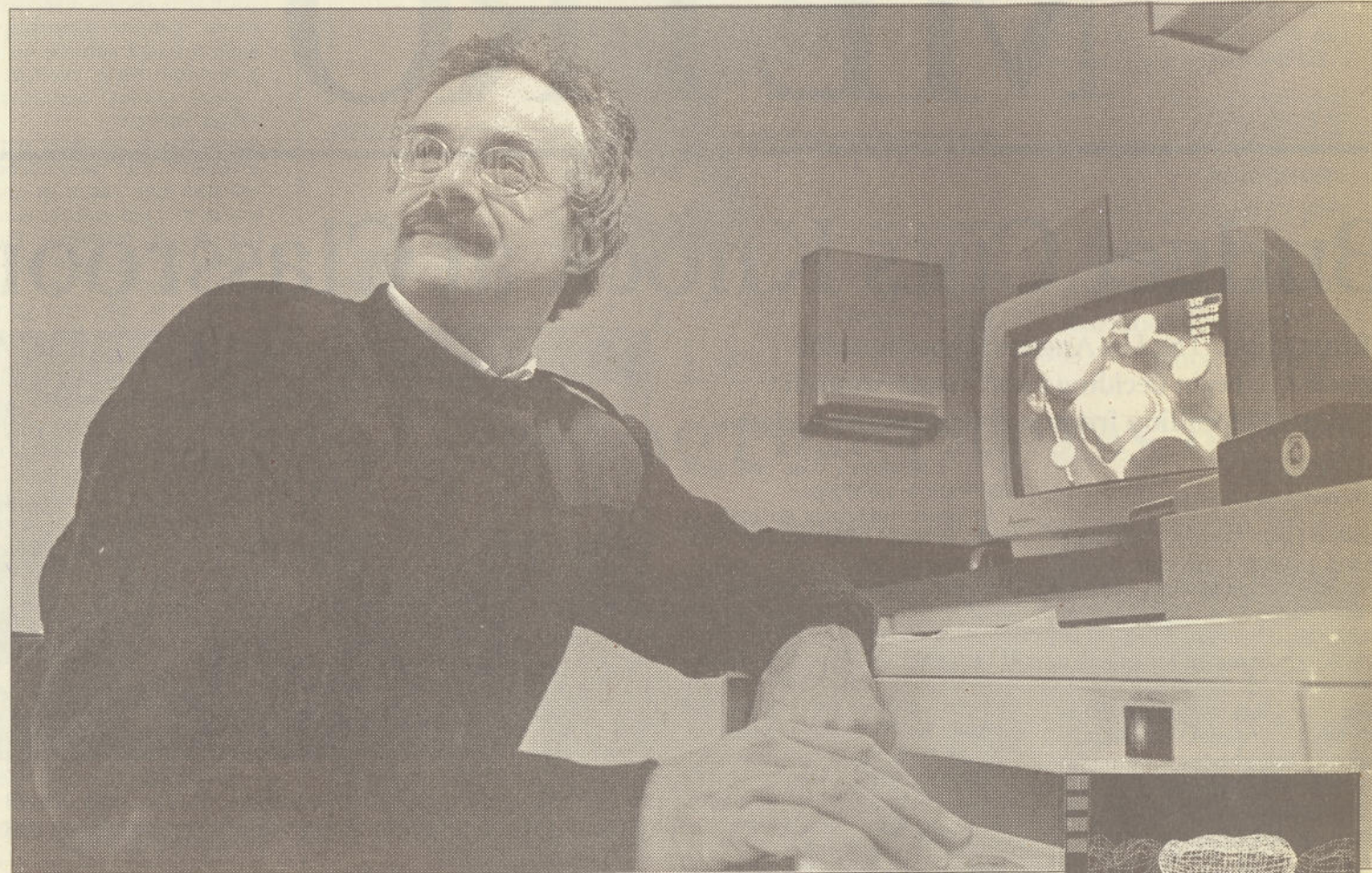
Modern dentistry has amassed some impressive triumphs, among them a dramatic reduction in cavities and longer life for natural teeth. Nevertheless the design and fabrication of replacement teeth remain dependent upon a method introduced 75 years ago.

Like the patchwork of metal fillings that used to decorate children's smiles, however, the hand-sculpting of dental crowns could become a rarity if new computer systems prove able to do the job better, faster and cheaper.

The computer method is based on CAD/CAM, for computer-aided design/computer-aided manufacture; it is not unlike the computer systems used by the automotive industry to shape car bodies.

Dental CAD/CAM uses a computerized camera to take pictures of the tooth needing repair, a second computer to custom design the prosthesis and a computer-driven milling machine to delicately chisel its contours. A system in the final stages of testing at USC's School of Dentistry can accomplish all this in one appointment, according to its inventor, Dr. Francois Duret, research professor and co-director of the school's new division of dental imaging.

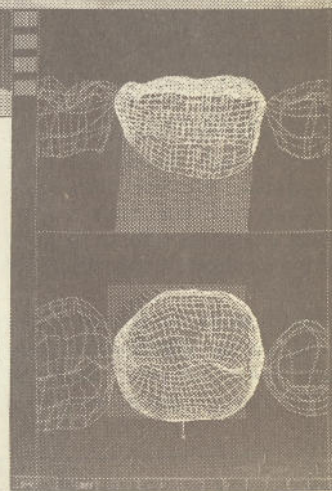
Two other systems are in stages of development in the United States. One is



ROBERT PACHECO / For The Times

Dr. Francois Duret, with computerized photo image of molars. Computer then draws a three-dimensional outline, at right.

Crowning



being marketed by Siemens Corp. and the other is in the design stage at the University of Minnesota. In Europe and Scandinavia, the technology has already been embraced by dentists in private practice.

The conventional method—as anyone who has gagged through the procedure knows—requires two or three long sessions at the dentist's office. For the dentist, making dental crowns, bridges and partial restorations called inlays or on-lays is a laborious process involving molds, wax models, casting and delicate finish work to hand-shape the replacement tooth.

The computer could change all that.

□

"I've been in dentistry 20 years and I tell you, this is the most exciting thing I've ever been involved with," said Dr. Milton Essig, an investigator at the University of Alabama working with Siemens' CAD/CAM. Patients with on-lays and inlays designed and milled by the computer system have been followed for 15 months with excellent results, Essig said.

Dr. Jack D. Preston, professor of esthetic dentistry at USC and Duret's co-director of the imaging division, said unequivocally: "This is the beginning of an entirely new technology while what we've done with porcelain and metal has reached the end of the line."

The American Dental Assn., however, takes a more conservative view.

"There is a tendency to get all excited about things too prematurely," said Dr. Charles Schoenfeld, the ADA's assistant secretary for scientific affairs and staff member to the association's council on dental materials, instruments and equipment. "I think the bottom line is that, yes, it appears to have promise, but it remains to be documented."

In the United States, only the Siemens system has received marketing approval from the U.S. Food and Drug Administration, and its capability is limited to partial tooth restorations.

Duret's system is more ambitious than Siemens'. It is designed to do crowns and bridges as well as partial restorations and is under review by the FDA for these expanded applications.

Duret, 42, is confident of CAD/CAM's future and is nothing if not tenacious.

It has taken him nearly 20 years to take

Achievement

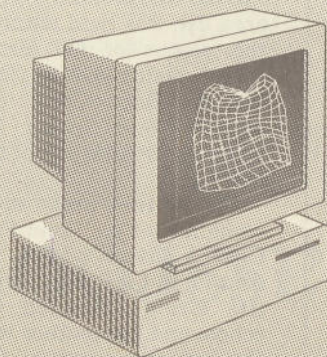
Bytes for a Better Bite

Dr. Francois Duret's method of tooth reconstruction uses three desk-top computers, one on a counter near the patient's chair, a second in a side room about the size of a walk-in closet and a third in a small room beyond that.



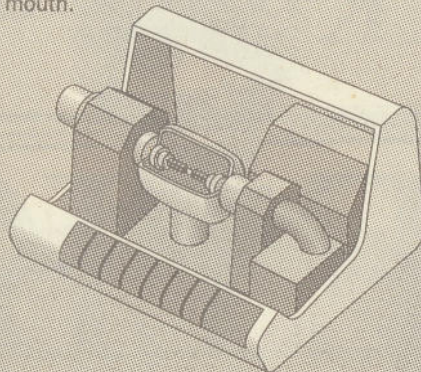
1. Laser Photography

Dentist inserts a wand-shaped camera into the mouth to photograph the patient's tooth from about 10 angles. The camera uses low-power laser beams to gather and feed information to the computer about contour and volume.



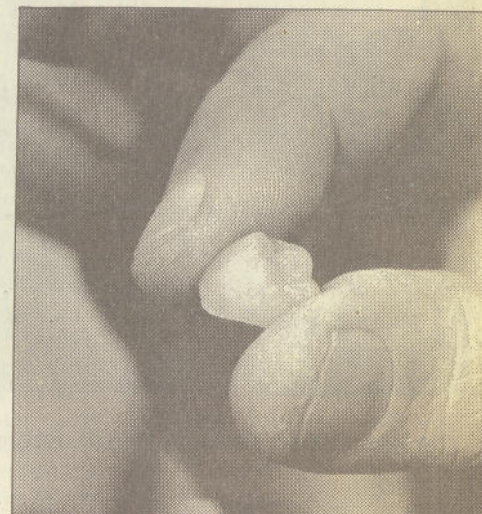
2. Computer-aided Design

The computer correlates all the angles to produce a three-dimensional picture of the patient's tooth on the screen. The picture is then transmitted to a designing computer where a replacement tooth is outlined. The dentist modifies the outline to customize the crown's fit. Because the dentist also has taken pictures of the opposing and adjacent teeth, the newly designed tooth can be visualized on the computer screen exactly as it will sit in the mouth.



3. Milling the Crown

Satisfied with the design, the dentist has the second computer send it to the third one, which guides a milling machine. Because dental CAD/CAM uses milling technology instead of molding, it opens the door to new prosthetic materials. Porcelain and metals have been the standard for crowns and bridges because molding requires materials that can be worked in liquid form.



ROBERT PACHECO / For The Times

Machine-milled crown ready for fitting.

the project from his garage workbench in a small town in the French Alps to USC. Along the way, he was jeered by French colleagues who thought his concept closer to science fiction than to reality. The University of Lyon, where he was an instructor at the dental school, ordered him in 1973 to abandon the project and focus his research efforts in more promising areas.

Duret continued to work on the software secretly, however, a duplicity that lasted seven years, he said, until faculty elders discovered it and fired him.

"They thought I was crazy," Duret said, grinning.

□

Duret's system is scheduled for field testing this summer in about 20 Southern California dental offices and laboratories, according to Jean-Claude Haas, a French

■ **Computers:** The technology that designs better cars now may do the same for replacement teeth. It may mean lower costs and more convenience for patients.

By IRENE WIELAWSKI
TIMES STAFF WRITER

Modern dentistry has amassed some impressive triumphs, among them a dramatic reduction in cavities and longer life for natural teeth. Nevertheless the design and fabrication of replacement teeth remain dependent upon a method introduced 75 years ago.

Like the patchwork of metal fillings that used to decorate children's smiles, however, the hand-sculpting of dental crowns could become a rarity if new computer systems prove able to do the job better, faster and cheaper.

The computer method is based on CAD/CAM, for computer-aided design/computer-aided manufacture; it is not unlike the computer systems used by the automotive industry to shape car bodies.

Dental CAD/CAM uses a computerized camera to take pictures of the tooth needing repair, a second computer to custom design the prosthesis and a computer-driven milling machine to delicately chisel its contours. A system in the final stages of testing at USC's School of Dentistry can accomplish all this in one appointment, according to its inventor, Dr. Francois Duret, research professor and co-director of the school's new division of dental imaging.

Two other systems are in stages of development in the United States: One is being marketed by Siemens Corp. and the other is in the design stage at the University of Minnesota. In Europe and Scandinavia, the technology has already been embraced by dentists in private practice.

The conventional method—as anyone who has gagged through the procedure knows—requires two or three long sessions at the dentist's office. For the dentist, making dental crowns, bridges and partial restorations called inlays or on-lays is a laborious process involving molds, wax models, casting and delicate finish work to hand-shape the replacement tooth.

The computer could change all that.

□

"I've been in dentistry 20 years and I tell you, this is the most exciting thing I've ever been involved with," said Dr. Milton Essig, an investigator at the University of Alabama working with Siemens' CAD/CAM. Patients with on-lays and inlays designed and milled by the computer system have been followed for 15 months with excellent results, Essig said.

Dr. Jack D. Preston, professor of esthetic dentistry at USC and Duret's co-director of the imaging division, said unequivocally: "This is the beginning of an entirely new technology while what we've done with porcelain and metal has reached the end of the line."

The American Dental Assn., however, takes a more conservative view.

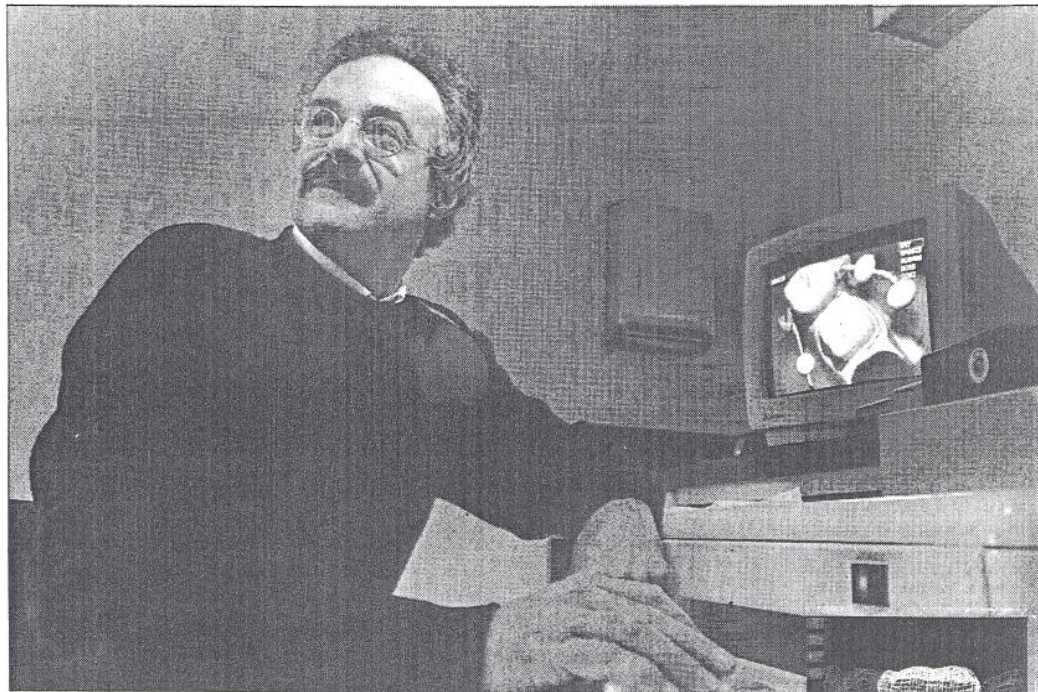
"There is a tendency to get all excited about things too prematurely," said Dr. Charles Schoenfeld, the ADA's assistant secretary for scientific affairs and staff member to the association's council on dental materials, instruments and equipment. "I think the bottom line is that, yes, it appears to have promise, but it remains to be documented."

In the United States, only the Siemens system has received marketing approval from the U.S. Food and Drug Administration, and its capability is limited to partial tooth restorations.

Duret's system is more ambitious than Siemens'. It is designed to do crowns and bridges as well as partial restorations and is under review by the FDA for these expanded applications.

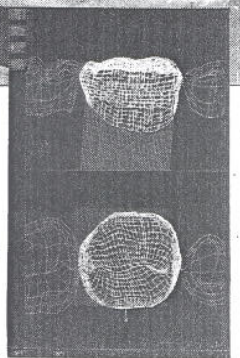
Duret, 42, is confident of CAD/CAM's future and is nothing if not tenacious.

It has taken him nearly 20 years to take



ROBERT PACHECO / For The Times

Dr. Francois Duret, with computerized photo image of molars. Computer then draws a three-dimensional outline, at right.



Crowning Achievement

Bytes for a Better Bite

Dr. Francois Duret's method of tooth reconstruction uses three desk-top computers, one on a counter near the patient's chair, a second in a side room about the size of a walk-in closet and a third in a small room beyond that.

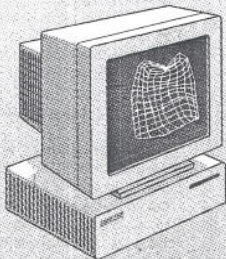


1. Laser Photography

Dentist inserts a wand-shaped camera into the mouth to photograph the patient's tooth from about 10 angles. The camera uses low-power laser beams to gather and feed information to the computer about contour and volume.

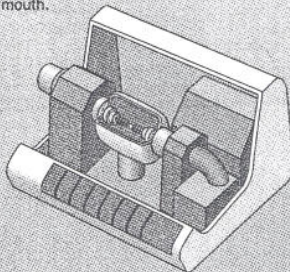
2. Computer-aided Design

The computer correlates all the angles to produce a three-dimensional picture of the patient's tooth on the screen. The picture is then transmitted to a designing computer where a replacement tooth is outlined. The dentist modifies the outline to customize the crown's fit. Because the dentist also has taken pictures of the opposing and adjacent teeth, the newly designed tooth can be visualized on the computer screen exactly as it will sit in the mouth.

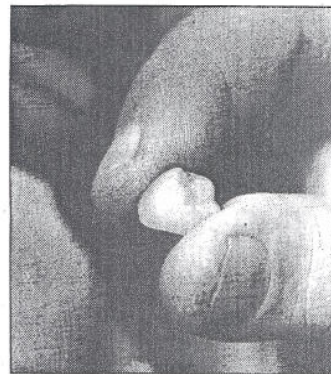


3. Milling the Crown

Satisfied with the design, the dentist has the second computer send it to the third one, which guides a milling machine. Because dental CAD/CAM uses milling technology instead of molding, it opens the door to new prosthetic materials. Porcelain and metals have been the standard for crowns and bridges because molding requires materials that can be worked in liquid form.



SANDY KAY/Los Angeles Times



ROBERT PACHECO / For The Times

Machine-milled crown ready for fitting.

the project from his garage workbench in a small town in the French Alps to USC. Along the way, he was jeered by French colleagues who thought his concept closer to science fiction than to reality. The University of Lyon, where he was an instructor at the dental school, ordered him in 1973 to abandon the project and focus his research efforts in more promising areas.

Duret continued to work on the software secretly, however, a duplicity that lasted seven years, he said, until faculty elders discovered it and fired him.

"They thought I was crazy," Duret said, grinning.

□

Duret's system is scheduled for field testing this summer in about 20 Southern California dental offices and laboratories, according to Jean-Claude Haas, a French