CACHE IS A DISEASE

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I regret to inform you as a reader of the CACHE News that anyone who has had some interaction with the CACHE organization or its Trustees in the last 25 years may have caught a disease called CACHE (Computer AIDS of Chemical Engineering Educators). It is an analog of the well-publicized AIDS, but affects the brain. In spite of many attempts by faculty to avoid the spread of this disease, it has become widespread throughout the chemical engineering educational community, and, like AIDS, seems to have no cure. CACHE has manifested itself in increasingly computer oriented educational environments.

You would be wise to be tested and/or treated for this disease as it is highly contagious and can be spread by simple contact. Faculty have been known to spread CACHE to students just through the air. Amusing, as this may seem, CACHE is no laughing matter! It is mainly a psychological disorder, but can fester into physical ailments such as painful wrist and eyestrain if not treated.

In Table 1 you will find a list of some of the symptoms that characterize CACHE, many of which may not be apparent for years. DO NOT INGNORE THESE WARNING SIGNS!

Table 1
Symptoms to Watch For

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1. You have the inability to read anything that doesn't scroll up.
2. You have sleep apathy - you have red eyes in the morning.
3. You have going without sleep in favor of sitting in front of the computer.
4. You have cyber anorexia – going without food to sit in front of a computer.
5. You have symbolic dyslexia – use of initials and short cuts rather than words.
6. You adopt a nickname in place of your real name.
7. When the going gets tough, you think its time to upgrade.
8. You blame your computer for your mistakes.
9. You find your computer programs do what you tell them to do but not what you want them to do.
10. You are stuck between deciding on black on white web pages or using your illegible school colors.

How did it all start?

In the 1960's chemical engineering faculty were happy to be using pencils, chalk, and blackboards, as their predecessors did for generations. Occasionally they would write an undocumented program full of bugs to assist students in the drudgery associated with solving more complicated homework problems. Several faculty observed that many software packages being developed at the time (largely at universities) were neither documented nor transferable. Although some faculty were enthusiastic about using computers, they were not interested in debugging and documenting their programs and disseminating the resulting software.

Instead of sticking to their last, as the saying goes, in 1969 14 chemical engineering educators met to form the CACHE (Computer Aids for Chemical Engineering Education) Committee (later the CACHE Corporation)

It was decided that the principal goal of the committee would be "to accelerate the integration of digital computation into the chemical engineering curriculum by inter-university cooperation in the preparation of recommendations for curriculum and course outlines and the development of new computing systems." It was agreed that although the committee's primary function would not be to directly supervise the programming of new software systems, it would encourage those who do prepare such programs (a) to avoid duplication of efforts, (b) to achieve, as much as possible, compatibility of independently created computing systems, (c) to adhere to standards for documentation and distribution of their programs, and (d) to stimulate new research efforts in the creation of new systems.

How did the disease spread?

Task forces were created by the CACHE Corporation, each comprised of CACHE members, other faculty, and practitioners from industry and government. These Task Forces did it! They spread the disease. At first very few people were infected other than the Task Force members and the CACHE Trustees. But as time went on some of the Task Force ideas and products were transmitted to the brains of faculty. Figure 1 shows many of the areas into which the disease crept.
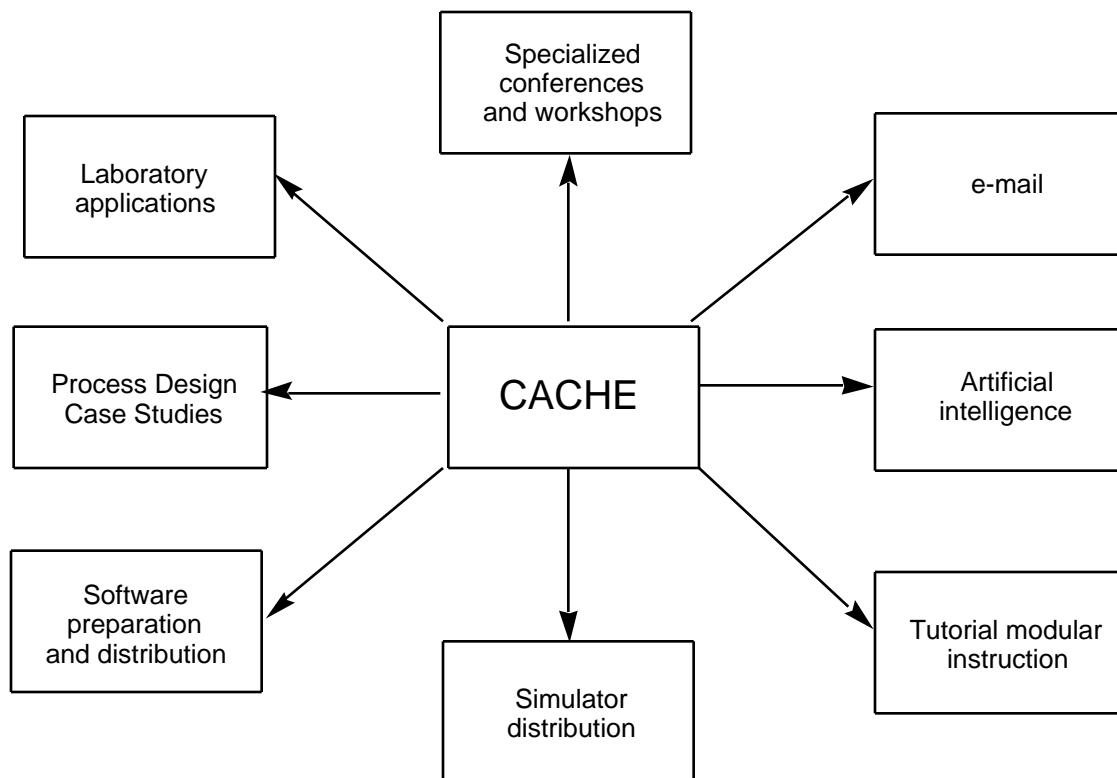
Figure 1. Map of the transmission disease

As with most incurable diseases, the arrows in Figure 1 indicate the irreversibility of the transfer.

Why did the disease spread so fast?

Almost every chemical engineering faculty member for some strange reason has a defective anti-CACHE gene. What is missing is a capacity to reject abstract thinking and languages. Such attributes as number sense, ability to handle abstraction, a sense of cause and effect, logical reasoning ability, and the capability to follow a causal chain of facts or events vary from person to person, but everyone has some degree of them unless they have genetic abnormalities (or are brain damaged). Apparently chemical engineering faculty have damaged anti-CACHE genes.

Where do we stand now?

It is too late to go back to the good old days – Pandora's box has been opened.

"New ideas pass through three periods:
· It can't be done.
· It probably can be done, but it's not worth doing.
· I knew it was a good idea all along!
Arthur C. Clarke.

Almost anything is easier to get into than to get out of.
Anon.

CACHE has affected all aspects of the chemical engineering curriculum. In process design the habitual use of process simulators such as the ASPEN products is not going away. In courses such as reactor engineering, by employing MATLAB and EXCEL faculty can make the students work on complicated problems. Even textbooks have been affected – they incorporate CD's in the back that have encyclopedias of equipment and programs to calculate physical properties. No longer will double interpolation in the steam tables be taught. To keep up with the Jones, faculty are being pressured to develop web based courses incorporating interactive pages, chat rooms, e-mail, and tutorials. Where will the disease stop?

What about the future?

I look to the future because that's where I'm going to spend the rest of my life.

George Burns, U.S. comedian
Who lived to be 100

The farther away the future is the better it looks.
Anon.

I cannot describe much about the effect of CACHE in the future and the spread of CACHE that has not been imagined and published in the open literature. But some scary predictions exist. For example:

> So what does the future portend?
> Eventually school as we know it will wither
> away. Initially, people will learn all the
> traditional subjects on the computer but in
> new ways that involve learning by doing.
> Eventually the traditional subjects will be
> combined since the idea of one
> professor/one course will go away. Students
> will work in complex simulated
> environments that teach many different
> kinds of things at the same time….. There
> will be no standard curriculum and no
> standardized tests….. The computer will
> certify those who have accomplished what
> they set out to accomplish in a simulation.
> Students will choose what they want to
> accomplish and will work hard to be capable
> in the areas that intrigue them. We will all
> be much better off for the change.
> *Roger Schrank in* <u>*Communications ACM*</u>*, Mar. 2001*

Faculty should sit up and take notice. In my view there is both good news and bad news. The bad news is that CACHE has set people's expectations at a very high level. The good news is that there are still one hundred years to go in this millennium.