O'Connell's more recent academic activities include belonging to such professional societies as ASEE-CED, AIChE, the American Chemical Society, the American Association of University Professors, the American Association for Advancement of Science. People who have shared committee service with O'Connell note that he has sensitivity, understanding, wide knowledge of the university, good rapport with campus people and is willing to take suggestions. They also say that as a committee member he is a "mover" and a "shaker". For example, he was the principal developer of the University of Florida Teaching Evaluation system which allows individual colleges to choose their own instrument. "While any system can be abused, I think the value of the information which should help improve teaching and of forcing many students to think about the quality of their education outweighs possible 'popularization' of courses and manipulation for wrong ends."

He is also a Danforth Associate, a program for selected faculty established by the Danforth Foundation to "promote the personal dimension of education".

O'Connell's professional fields of interest include applied statistical mechanics and molecular studies, solution thermodynamics (including electrolytes), transport properties of gases, adsorption and surface diffusion, materials and computer calculations. In addition to the usual graduate research direction, he has had a number of undergraduates work directly with him in these areas.

In his private life he concentrates his interest on his family. Their favorite activity "Which happens too infrequently", is travel and camping in their pick-up camper. He particularly enjoys watching the growth of his two sons and one daughter with their diverse talents and personalities. While John devotes the same energy and enthusiasm to their development, he does find limits to their patience with his teaching style. He also "too infrequently" enjoys the products of his wife's culinary expertise, renowned not only among faculty and students in Gainesville, but also among professional visitors fortunate enough to have a dinner or party given in their honor at the O'Connell home.

If all the foregoing paints an unusual picture of John P. O'Connell, it must certainly be founded in fact. In his own words O'Connell says:

"Any one who professes to be a thermodynamicist has got to be a peculiar person!" □

ChE letters

Emphasis on Quality

Sir.

Our ad on page 252 of CHEMICAL ENGINEERING EDUCATION, Volume IX, No. 4, Fall 1975, contains a more-or-less egregious error: the substitution of the word "equality" for the word "quality".

We recognize the importance of CHEMICAL ENGINEERING EDUCATION and appreciate the amount of work that goes into preparing such a publications. Thang you for your efforts.

Noel de Nevers
University of Utah

Editor's Note: *CEE* regrets this typographical error. The corrected ad appears below.

Fall Issue Feedback

Sir:

In the Fall 1975 issue of your Journal, an article by Donaghey discusses "Critical Path Planning of Graduate Research." This paper is somewhat misleading, because it indicates that the process is performed just once per project.

The sequence that Donaghey describes in his Table II does not stop with Tasks 8 and 9, because the Task 8

(Compare Theo and Expt) almost always reveals an unsatisfactory level of agreement. So it is necessary to go through the cycle again, perhaps with a better definition of the problem, and a different choice of material (e.g. higher purity) etc. The cycle is repeated, over and over; and improvement of agreement (Task 8) in successive cycles is what tells the research worker that he is changing his parameters—and his concepts—in the right direction. This is a feedback process, of course.

At the start of *each* cycle, the worker should carry out a critical path analysis, in order to optimize his project plan.

Donaghey's contribution is an important one; but it needs amplification in regard to the cyclic, feedback process, and to epicycles on the main process and to the criteria which are used to terminate the research.

Robert J. Good
State University of New York—Buffalo

The Chemi Project

ORIGINALLY FORMED in 1971 to meet the need for introducing computer usuage into the curriculum, The CACHE Corporation, successor to The CACHE (Computer Aids for Chemical Engineering Education) Committee, is now addressing itself to the even greater challenge of producing educational material geared to the more rapid infusion of new subject matter into the curriculum, more cost-effective training methods, increasing student problem-solving competency, and the generation of non-traditional texts and expository training material.

In an effort to achieve these goals, CACHE formed several task forces, one of which was on modularized instruction. Aware of the interest in self-paced instruction and the improved student learning from such instruction, (as evidenced by growing attendance at teaching institutes and numerous articles [1, 2, 3, 4], the task force prepared a proposal for the NSF to produce self-study modules for use by undergraduate ChE students and also for continuing education. In July of 1975 a $150,000 NSF Grant, over a three year period, was awarded to CACHE, for The CHEMI (Chemical Engineering Modular Instruction) Project. The grant is specifically for producing and distributing self-study, single concept, text (print) modules in ChE. These modules will cover the entire ChE undergraduate curriculum. From 40 to 70 modules are planned in each of seven curriculum areas: control, transport, stagewise processes, design, material and energy balances, kinetics, and thermodynamics. They are intended as lecture and textbook supplements for students self study, student evaluation, and concept demonstrations in the case of those modules which embody simulation type of computer programs. Also, once the modules are written, path finding algorithms will be used to trace prerequisite skills and develop curriculum guides which may be useful for ordering the modules and helping curriculum planners.

What is a module? The word "module" has several meanings in different contexts. Tosti [5] and Koen [6] have defined an educational module as follows: "A module is a self-contained section of learning material that covers one or more topic areas. It should be sufficiently detailed that an outside evaluator could identify its educational objectives and evalu-

(Continued on page 52.)

ACKNOWLEDGMENTS

The following companies donated funds for the support of

CHEMICAL ENGINEERING EDUCATION DURING 1975-76:

MONSANTO COMPANY

3M COMPANY

We also thank the 133 Chemical Engineering Departments who contributed to the support of CEE in 1975!

THE CHEMI PROJECT

Continued from page 17.

ate a student's achievement of those objectives." EMMSE (Educational Modules for Materials Science and Engineering) held a one day meeting to arrive at some consensus concerning the description of a module. The most important agreement reached at the meeting was that each module should be explicitly described in several dimensions, with the length as the principle parameter. The following table shows cross-referencing to other terminologies which describe length.

COURSE DESCRIPTION	MODULE DESCRIPTOR (approximate time)	BOOK ANALOG
single aspect	**5-min module**	**paragraph**
single topic	**15-min module**	**section**
1 classroom lecture	**1-hour module**	**'n' sections**
1 week's lectures	**2-hour module**	**chapter**
1 semester's lectures or 1 course	**45-hour module**	**book**

The descriptors for a given module might be as follows:

- Four modules on "Thermodynamics"
- Discipline/Level: Engineering/college juniors
- Length: 15 minutes each
- Medium: 16 mm color-sound technicolor movie cassette

For the CHEMI Project all the modules will be text (print) modules on 8 1/2 x 11 paper. Each module will be roughly from 7 to 15 pages in length (excluding problem solutions), single spaced, with an educational content equivalent to about a one hour lecture, and covering, in general, a single concept.

The entire ChE community is invited to join in this venture by writing modules in their areas of interest. The following recognition and compensation will be given to module authors.

- **Wide distribution of modules to the ChE community with identification of author and institution in the copy and on the cover**
- **Announcement of the availability of modules in the CACHE NEWSLETTER and in periodic news releases to ChE journals.**
- **$50.00 Honorarium for each module.**
- **The review process is designed to enhance the professional recognition of the author's work and make it comparable to that of research articles.**

While many modules have already been commissioned, many have not. If you are interested in writing a module, please contact the appropriate editor listed below. He will then send you a complete listing of module topics and an author's kit including a sample module.

The project is directed by Ernest Henley (U. of Houston) and his assistant director is William Heenan (U. of Puerto Rico). The editors in charge of the 7 curriculum areas are: Kinetics—Billy Crynes (Oklahoma State U.) and Scott Fogler (U. of Michigan), Thermodynamics—Bernie Goodwin (Northeastern U.) Control—Tom Edgar (U. of Texas), Transport—Ron Gordon (U. of Florida), Stagewise Processes—Ernest Henley (U. of Houston), Design—Bob Jelinek (State U. of New York, Syracuse) and Bob Weaver (Tulane U.), Stoichiometry—Dave Himmelblau (U. of Texas).

The entire project is under the oversight of a steering committee: Lawrence Evans (M.I.T.), Gary Powers (Carnegie-Mellon U.), Ernest Henley (U. of Houston), David Himmelblau (U. of Texas), Duncan Mellichamp (U. of California), and Robert Weaver (Tulane U.). □

William A. Heenan and
Ernest J. Henley
University of Houston

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3. Koen, B. V., "Self-Paced Instruction for Engineering Students", *Engineering Education*, Vol. 60, No. 7, March 1970, pp. 735-736.
4. The Engineering Concepts Curriculum Project (ECCP) is an NSF supported High School Curriculum Development.
5. Koen, B. V., The Bureau of Engineering Teaching, University of Texas at Austin.
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7. EMMSE (Educational Modules for Materials Science and Engineering) Brochure Vol. 1, No. 1, May 1975.

Editor's Note:
At a talk given at the University of Florida, Prof. John J. McKetta of the U. of Texas read the following note he received from a student. The editor thought we would share this with our readers.

The Last Psalm

Dr. McKetta is my Professor, I shall not pass.
He maketh me to exhibit my ignorance
on every quiz,
He telleth me more than I can write down,
He lowereth my grades.
Yea, though I walk through the corridors of the classrooms of knowledge,
I cannot learn.
He tries to teach me,
He writeth the equations before me in hopes that I can understand them,
He bombardeth my head with "rules of thumb".
My sliderule freezeth up.
Surely enthalpies and entropies shall follow me all the rest of my life,
and I shall dwell in the College of
ChemEngineering forever.
AMEN