The Amateur Computerist

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Opposing Viewpoints: Should Public Funds Support Private UAW-Ford Academies?

Letter from Editor of *Detroit News*

March 1, 1990

Dear Ms. Hauben:

This is a response to the questions you raised in a telephone call recently concerning the arrangements between the Ford Motor Company and the Garden City and Dearborn school districts.

Two of our top reporters and an editor have examined the material that you gave us at the *Detroit News* Dialogue '89 meeting last year. They have reviewed the material with the Wayne County Prosecutors'

Office and are satisfied that a public/private partnership, such as this one, is not unconstitutional.

It appears to us that this particular public/private partnership supports a worker training program and that the intent of that is positive in fulfilling that community need. Our understanding, additionally, is that most of the program content is directed toward teaching basic English and arithmetic skills. Your contention that the program should focus more on teaching computer programing is a valid criticism, but this is a subject that is covered often in our newspaper in a more general way and in itself is not sufficient reason to run a story.

Certainly there are some political objections to public/private partnerships in Michigan. These partnerships are supported by Governor Blanchard and, if there is a true issue here, it seems to us it will emerge during the gubernatorial elections this year. Overall, our review of the circumstances suggest that there is no news to report on this issue at this time.

With all best wishes.
Sincerely, Robert H. Giles
Editor and Publisher, *The Detroit News*
615 W. Lafayette Blvd., Detroit, MI 48226

(Editor's note: See vol 2 no 4 of the *Amateur Computerist* for Prosecutor's letter acknowledging that the nonpublic school at the Ford Rouge Engine Plant operates in contravention of the Michigan Constitution, Art 8, Sect.2.)

Don't Replicate UAW-Ford School

When Barbara Bush visited the UAW-Ford training program at the Ypsilanti Ford plant, ["First Lady Makes Friends On The Line", *Flint Journal*, Feb. 23, Page A2] she was quoted as saying "I suspect people are going to copy them all over the country."

Perhaps she didn't know that the Ypsilanti project is part of a

program operating out of a headquarters building on Dearborn Public School property. Each year, at least $100,000 of Dearborn Public School funds are diverted from the needs of Dearborn's school children to serve the private interests of the world's second largest corporation.

Also, the Ford-UAW Rouge Academy, copied after the Ypsilanti Ford program has been cited by the Wayne County prosecutor as in contravention of the Michigan Constitution [Art. VIII, Sec. 2]. Meanwhile, the Michigan Department of Education has begun to phase out $4 million in annual state aid to Ypsilanti because of irregularities in its adult education program.

The Michigan Constitution forbids the use of any public education funds to directly or indirectly aid a non-public school such as the academy run by Ford in Ypsilanti. That's why there are taxpayers and people in Dearborn and elsewhere who disagree that this program should be copied all around the country.

RONDA HAUBEN
Dearborn

(Reprinted from *The Flint Journal*, 3/13/90/ p. A8)

Editorial: When Will Their Walls Come Tumbling Down
The Battle Over Programming

Recently, on a computer bulletin board called MNET in Ann Arbor, Mi, there was an item posted asking for opinions evaluating the 1980's.

"Item 8 entered Thur, Dec 28, 1989 (02:27) by lk

A look back at the 1980s

The 1980s are now history. When you reflect on this time period, what stands out? How will it compare to the 1970s, 60s and 50s?"

There were 56 responses. (In our next issue, we will sample some of the responses.)

One response stands out, however. It said: "#4 (sno) Fri, Dec 29, 1989 (17:09) Personal computers. Nothing else matters."

With this response, we begin the 3rd year of publication of *The Amateur Computerist*. And this year begins the last decade of the 1900's.

The Amateur Computerist is the child of the personal computer. It is also the child of the battle over who will be allowed to program the personal computer. This newsletter grew out of the fight for computer programming classes by workers at the Ford Rouge Plant in Michigan. Recent developments make clear this fight has significant national and political ramifications.

Following are some of the key events that help explain the background of this fight.

In Spring of 1983, computer programming classes were begun at the Dearborn Engine Plant. The classes met with eager interest on the part of workers and continued to grow and expand.

Classes ran smoothly and the program expanded until Fall, 1985. Then, despite the contractual, state, and federal funding requirements to continue and expand the computer program at the Dearborn Engine Plant, the classes were cut back. These cutbacks were opposed by students and the teacher of the classes.

A hard fought battle ensued from 1985 until 1987 to keep the classes going.

On February 4, 1987 a letter was sent to officials of Ford, the UAW, and the Dearborn Schools asking why computer programming classes were being cut out at the Ford Rouge Plant. The letter contained a post script which said: "And we shouldn't be treated as if we're doing something wrong. Why are you trying so hard to discourage us from continuing our programming training?"

Several names of UAW members followed the post script. Despite continued opposition, computer programming classes were cut out at the Ford Rouge Plant.

Related Event 1: On October 11, 1987, a worker at GM's Delco Remy division in Anderson, Indiana was crushed by a robot and died. After many delays and obstructions, the Indiana Office of Safety and Occupational Health fined GM $6000 for the incident citing inadequate training.[1]

Related Event 2: On October 29, 1987, the Chairman of the

Michigan Job Training and Coordinating Council, Philip Power, (Chairman, Suburban Communications Corp., Ann Arbor, MI) testified to a subcommittee of the Joint Economic Committee of the U.S. Congress. As part of his testimony he said:

"Foreign numerically controlled machine tools can be 'unlocked' partly because blue-collar workers can be taught to do the necessary programming, while American machine tools are 'locked' partly because blue-collar workers cannot easily be taught the necessary programming."[2]

Question: Why was a spokesman for the State of Michigan telling the U.S. Congress that American workers could not be taught computer programming, when workers at the Ford Rouge Plant had proven this was untrue?

The Ford Rouge Plant in Dearborn, MI was the pilot program, along with the Buick City Plant in Flint, MI for the introduction of what were to be worker training programs to deal with new technology. Yet at the Ford Rouge Plant computer programming classes were cut out despite petitions, letters, and repeated other efforts.

Meanwhile workers were being killed by robots, with poor training cited as the cause.

Why the gap? In *Rude Awakening*, auto industry analyst Maryann Keller provides a helpful clue to the problem. After describing the death of Donald Morris, a GM worker who was crushed by a robot, she explains:

"Like many of his coworkers, Morris had not received proper training in robotics. While management was feeling the pressure to improve quality and productivity, the union was concerned about protecting jobs and had combined some job classifications to increase flexibility. But training workers in the new technology was a slow process. In a period of three years, only about 10 percent of the work force had enough training in the technology to function even minimally. These were assembly line workers, not computer programmers. They didn't learn the complex programming skills overnight...."(*Rude Awakening*, p. 204)

Workers at the Ford Rouge Plant who had learned programming skills overnight and wanted advanced classes, proved that Maryann

Keller's analysis, like Philip Power's, was faulted. When their petitions and letters to continue their computer programming classes met with a stone wall of silence from both union and company officials, UAW members requested an investigation into what had happened. They wrote the following leaflet which was posted around the Rouge Plant. It said:

"UAW members have been fighting for 1-1/2 years against attempts to cut out the classes in computer programming held at the D.E.P. UAW members contribute 17 cents an hour straight time and 50 cents an hour overtime to have these classes available. The most critical point for UAW members is to have training in high technology. How can UAW members be trained in high technology by cutting computer classes out?"

"We contacted Ben Love, Chairman in the Engine Plant, and he didn't give any result. We contacted Roger DeShetler and Eamon McClafferty, management in charge of training in the Engine Plant. We contacted Bob King, President of Local 600, and Ernest Savoie and Peter Pestillo at Ford Motor Co., and Don Liddell and Owen Bieber at UAW. We sent letters everywhere. We are tired of being denied benefits we're entitled to. We're tired of being shuffled from one person to another so as to cover up who we're fighting. We don't know what classes are being offered from one course to the next. We ask for programming in BASIC and they offer PASCAL. We ask for PASCAL to be continued, they offer advanced BASIC. There are no rights to grievance how the monies are being spent. But the Letter of Understanding (in the 1984 UAW-Ford Contract) says: 'In view of the Company's interest in affording maximum opportunity for employees to progress with advancing technology, the Company shall make available appropriate specialized training programs for employees.'"

"But this is not being provided. We can't sit back and let happen at Rouge what has happened at GM – the wholesale closing of plants. WHERE IS THE MONEY GOING? WHAT KIND OF EDUCATION DO YOU WANT FOR YOUR MONEY? WE NEED AN INVESTIGATION INTO WHAT IS GOING ON IN THE UAW-FORD PROGRAM AT THE DEARBORN ENGINE PLANT"

That investigation never happened. Neither Maryann Keller, nor Phil Power, nor any government official has acknowledged that there is

even a problem. But there has been a carefully orchestrated propaganda barrage to deny the desire and capability of American workers to master the new computer technology. Instead, the myth has been created of widespread nonexistent illiteracy and of the need to teach American workers to read before they can learn to do computer programming.

Why the distortions?

Management oriented spokesmen are not interested in a workforce able to deal with new technology. Rather they are interested in job specific training to make workers more "adaptable" so employers can tighten their control over workers. Many tales have been told of how U.S. companies have introduced robotic equipment only to have it malfunction. The workers who were overseeing the equipment were often denied the training and authority needed to get the equipment to function effectively. Though Maryann Keller's book *Rude Awakening* tells the story of a worker who ends up being killed as a result of this contradiction, her conclusion is that management should refrain from introducing new technology, not that a broader view of training is needed. She proposes using the old technology of the 1950's more efficiently, as she claims the Japanese do. Her solution is that labor relations and job design used in the U.S. be modeled after that of the Japanese – essentially a return to the pre 1930's style company unions that were declared illegal by the National Labor Relations Act. This prescription for a return to the obsolete technology of the 1950's, and to the obsolete labor relations of the 1920's – is a prescription for retrogression, not for a solution to the problems of developing technology.

The investigation called for by students in the UAW-Ford program at the Dearborn Engine Plant is still needed. But it has become clear that it was not just officials of Ford and the UAW that were responsible for cutting out computer programming classes, but government officials in Michigan and in the U.S. Congress as well.

In 1989 the world celebrated the 200th anniversary of the fall of the Bastille and the beginning of a new era begun by the French Revolution.

In 1989 the Berlin Wall came down.

The victory of the French Revolution 200 years ago was the product of new machinery which was being impeded by obsolete political institutions. In England, the divine right of Kings had been successfully

challenged and thus the Industrial Revolution could bring about a bloodless change in the political institutions and power. In France, new technology had rendered the old system of a Divine King obsolete. But it took a revolution in France, to sweep away the obstacles preventing the use of the new machines.

There is a serious problem in the U.S. today if workers' efforts to learn computer programming can be treated with such disdain not only by officials of Ford and the UAW but also by stock market analysts like Maryann Keller and state spokespersons like Philip Power. The personal computer, however, is a wondrous new machine and the brick wall denying computer programming education to workers will have to come down if modern technology is to develop in the U.S. The investigation requested by workers at the Rouge plant was never conducted. But Congressional Hearings demonstrate that the problem is broader and wider than Ford and the UAW and it involves public officials also. It seems that what is needed is an investigation involving state and federal government officials as well to understand how this wall was created and how it can be brought down.

Notes
(1) Maryann Keller, *Rude Awakening*, N.Y., 1989, pg. 203-4.
(2) "Competitiveness and the Quality of the American Workforce," Subcommittee. on Education and Health, 100th Congress, part 2, p. 20.
Philip Power is quoting from *The Zero Sum Solution* by Lester Throw.

LETTERS TO EDITOR

I would like to add an opinion to the "History of the Computer" article: there is a very important reason for John Kemeny and others not to want the computer to replace the teacher in education.

The textbooks used today in schools are so thick, wordy, boring and esoteric the teacher is virtually assured a job just translating and explaining the book into plain English. Take, for example, the average algebra book. It is written in confusing, highly specialized language

(most of which is not sufficiently explained within the text) and the examples are so complicated. This makes it useful only as a review for experienced mathematicians, and very unwieldy for those who only want to learn.

This lets the teacher do something: explain the concepts in the book to his students.

But if a computer were to be used, it could be programmed with clear language, a key to define unfamiliar terms, and provide the student with individual instruction. The computer has the power to repeat concepts infinitely until it is learned by the student, and the computer has infinite patience. This would be impossible with a regular teacher. The teacher would almost become superfluous! The student could learn at his own individual pace, making school a lot more interesting. Only three or four teachers would really be needed in case of extenuating questions. And of course a computer repair man!

It is obvious why teachers and educational types would not want their carefully setup system threatened.

Scott McMahan

I just reread your newsletter (Vol 2, No 2 -ed) for about the fourth time particularly the article on the six hour day by Jay Hauben. I believe that the objective is a good one, but it is going to be difficult to achieve. Unions are going to have a hard time in achieving their goals due to the Internationalization of business. I covered my thoughts on this subject in my last letter. (See Vol 2, No. 3 “Automation will Probably Not Help Labor” -ed) Also the situation today versus the situation in England resulting from the Industrial Revolution is not quite comparable. The demand for any kind of products before and during the Industrial Revolution was insatiable. This is no longer true. I cite the automobile, the unlimited expansion of the automobile market is not possible due to its effects on the environment, availability of fuels and the problems with traffic congestion. This is also true of other products such as electronic equipment. The market for TV’s would also be limited regardless of price as most people even in Third world countries already have these.

I would suggest that the future market for goods and products are mainly in the housing, highway, sewage, water plant, bridge and airport construction. In all of these areas the impact of the computer is relatively limited. Also in these areas since they affect the domestic market the

impact of the Unions could be greater than in the Industrial Mfg. Sector which is becoming more and more Internationalized.

I also reread the article by Floyd Hoke-Miller (Jobs: Hours and Sense, vol 2, no 2 -ed) and I believe that he is correct as far as he goes. However I still believe that the anticipated impact of the computer on man must be pragmatically studied by all to determine two areas; one how will the computer affect man, and the second what can we do to direct its effect to benefit man.

To me it is clear that the computer could potentially be a major factor in reducing the workday. What is not clear is how this could be achieved within the current political and economic framework.

You keep mentioning the sitdowners.* I believe their history is interesting and its study could be productive providing we can apply what we learn to the current situation. I am not sure that much can be applied. I believe that one of the reasons the sitdowners won was industry suddenly realized that they could be more profitable by embracing Unions. I believe that with a one dollar raise to labor, two dollars was passed to the consumer. Also they made labor the scapegoat for high prices. Labor is still the scapegoat but Industry no longer needs to cater to labor as they did during prior years. Labor is going to have a real tough battle to maintain what they currently have. If labor should temporarily win a battle industry will probably move more of their work overseas.

Dave Pollack

(* Editor's Note: See editorials in vol. 1, no's 1-3)

I read the *Amateur Computerist* April Edition.... Keep up the good work and I wish you well.

Article Ideas:

In one issue of *Time* magazine the entire issue was devoted to the socioeconomic changes currently happening in Russia. Included in this issue is a section devoted to the prospects of upcoming computer hackers in the Soviet Union. Read it, summarize it, and report on it.

Rebuttal

(The article on free speech... -ed)* made me sick. I don't believe in

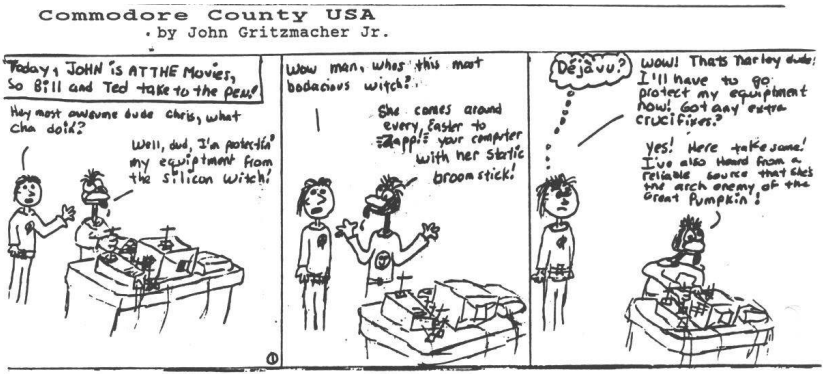
unlimited access of information to everyone. I realize we live in a "FREE" society but, there are certain things which can and must be kept secret. Let's take a moment and look at Russia.... Have you seen the Russian Space Shuttle? Does it look familiar or remind you of anything? Did you know the Russians have recently invented FUSION? (Hum, maybe they read the science section of the *Detroit News*. They explained it in great detail.)

Back in my high school days the boards were full of text files on how to build explosives, rip off payphones, and gain illegal entry into computer systems. Did you know that computer hackers racked up over $1 MILLION in illegal unpaid phone calls last year? Unlimited information in the wrong hands can cause disaster. The average computer geek is 14 years old. He spends most of his time on his modem downloading files from all over the country (usually by phreaking.) Where do you think the little rug rats got the info on how to make illegal phone calls? Gee, maybe they read the posts on our boards. Information is a valuable tool but, too much information can lead to destruction.

Sensitive information should only be given to "MATURE" adults. You are a youngster and think as the radical youngster does. Immature computer geeks shouldn't have information on how to build Atomic-Bombs. Think about it.... I am for the free trade of information but, we must be responsible into whose eyes and ears our information falls.

Michael George III

(*Editor's Note: This letter is in response to "Computers and Free Speech", *Amateur Computerist*, vol 1 no 3)



The Spirit of Babbage
Chapter ONE

In the beginning The Spirit of Babbage created the software and the hardware.

And hardware was expensive and low-tech; and incompatibleness was on the face of the hardware.

And The Spirit of Babbage said, Let there be a micro, and there were micros.

And The Spirit of Babbage saw the micro, that it was good: and The Spirit of Babbage divided the Micro from the Mainframe.

And The Spirit of Babbage called the micro Mark 8, and the Mainframe he called the IBM.

And the evening and the morning were the 1st day.

And The Spirit of Babbage said, there be a firmament in the midst of the common elements, and Let it divide the transistors from the ICs.

And The Spirit of Babbage made the firmament and divided the common elements which were ICs from the common elements which were transistors: And it was so.

And The Spirit of Babbage called the Firmament history. And the evening & the morning were the 2nd day.

And The Spirit of Babbage said, Let the common elements from recent history gather together unto one place and let the clubs appear: and it was so.

And The Spirit of Babbage called the new clubs, homebrew clubs; and the gathering together of the common elements Zilog: and The Spirit of Babbage saw that it was good.

And The Spirit of Babbage said, Let the Hardware be programmed after Jacquard's kind: and it was so.

And the Hardware was programmed: and The Spirit of Babbage saw that it was good.

And the evening and the morning were the 3rd day.

And The Spirit of Babbage said, Let there be microcomputer companies to divide the 4 bit from the 8 bit microprocessor, the 8 bit from the 16 bit microprocessor, and the 16 bit from the 32 bit micropro-

cessor.

And let them be for the existence of versatility in the world: and it was so.

And The Spirit of Babbage made two great companies, the greater company to dominate the business world, and the lesser company to rule the graphics world: and The Spirit of Babbage made the competition too.

And The Spirit of Babbage set them in the Fortune 500 to make sure they could be versatile: and The Spirit of Babbage saw it was good.

And the evening and the morning were the 4th day.

And The Spirit of Babbage created the Altair, which stored data on paper tape, And every Commodore Pet which stored data on cassette tape after his kind: and The Spirit of Babbage saw that it was good.

And the evening and the morning were the 5th day.

And The Spirit of Babbage said, Let the Amateur Computer Clubs bring forth the microcomputer, which stored data on disks, called Apple: and it was so.

And The Spirit of Babbage said, Let us make IBM PCs in our own image, after our likeness, and let them have dominion over the Altair with paper tape storage, and over the Commodore Pet with cassette tape storage, and over the Apple with disk storage.

So The Spirit of Babbage created the IBM PCs in his own image, in the image of The Spirit of Babbage created he it; XT and AT created he them.

And The Spirit of Babbage said, Behold I have given you every programmer, who are in the clubs, and of every piece of software, who wrote all of the pieces; to you it shall be meat.

And to all of the other computers with paper tape for storage, and to every computer with cassette tapes for storage, and to every computer with disk drives for storage, wherein they work, I have given all pieces of software for meat: and it was so.

And The Spirit of Babbage saw everything that he had made, and, behold, it was very good. And the evening & the morning were the 6th day.

Chapter TWO

Thus the hardware and the software were finished, and all the host

of them.

And on the 7th day The Spirit of Babbage ended his work which he had made; and he rested in the seventh day from all the work he had made.

But The Spirit of Babbage rested by playing computer games on all of his creations.

And The Spirit of Babbage decided to bless this day by creating a place for him to play computer games peacefully. And The Spirit of Babbage said, Let there be a Charles Babbage Institute. And there the Spirit of Babbage awaits.

To be Continued...in the future.

Michael Hauben

CoCo Corner

It is time once again to venture into the dim light of the CoCo Corner. This month I do not have a program for you, since I would like to take time out to point to some of the features the COCO has that the owner's manual does not discuss but that can be discovered by a little trial and error.

The thing I mentioned last installment about the screen color is very useful, if only to get people's attention. Screen 0,1 will make the screen a color I named Infernal Orange.

Another semi-useful command is poke 113,0. WARNING: Poking this in has the same effect as turning your computer off and back on again. The best practical use for this feature would be in a security system for a program. Suppose the password is "jungle" and you want the program to self destruct if the proper password is not supplied. You could use a subroutine like:

```
1000 rem: PASSWORD SUBROUTINE
1010 A$ = "JUNGLE:
1020 LINE INPUT "PLEASE SUPPLY THE PROPER PASSWORD:";
```

```
   B$
1030 IF A$ = B$ THEN RETURN ELSE POKE 113,0
```

Which would cause the program to be erased from memory in the event someone put the wrong password into the computer.

Suppose, though, that you need even more security than that. You may have programs that you only want certain people to use! You may not want them to fall into the wrong hands, whoever they may be. The best thing to do would be to create your own version of Basic. This is not as hard as it sounds, and even the most beginner of programmers could accomplish it.

The Basic and EXTENDED BASIC of the COCO-2 are located in the poke areas 32768 to 49151. To see what it looks like, use the following line (print #-2, can be used in place of print to feed the information to your printer).

```
For A = 32768 To 49151 : PRINT CHR$ (PEEK(A)), A: NEXT
A
```

This will print the character that is being held in the numbered location in your memory, then print that location for your reference (You'll need it in a second). To change something, find the numbered location for it, then use the poke command to poke in the ASCII number for the letter you want to put into that location. That sounds a little rough, but it isn't. Here's an example: Suppose I wanted to change the command **THEN** to **XMEN**. First I go to the list and find out **THEN** occupies the numerical position 43775 to 43777. Now I simply figure out the ASCII (which, incidentally, stands for the American Standard Code for Information Interchange) for **XMEN**, which is 88, 77, and 67, 78 respectively for the letter. The only drawback for this procedure is that you cannot change the final letter of each word. But, to get xmen poke in, I use the command: POKE 43775, 88:POKE 43776, 77:POKE 43777, 67

And the computer ceases to have the word **THEN** in its vocabulary. You can go on and on and change all the words you need for a completely new and unique programming language (named after yourself if you prefer). Numbers could be used in place of letters, But they would be a nuisance to try to remember even if they offered greater privacy.

Your new language should be incorporated into a program you should save securely, since every time your computer is shut off the memory reverts to normal. You can use this program to load your new language into the memory before you begin to use your computer each time you start it up. Only people with your special program could use any programs you write. I suggest you put all the numbers to be poked into a data statement, followed immediately by the ASCII number to be poked into that location. Use two variables in your Read statement, and poke the two numbers after they are read.

Before I go, I would like to produce living proof that my closing salutation is the truest law of computer science: Last issue, I inadvertently placed the statement screen 0,1 on the wrong line. Mr. Mike Hauben pointed out my mistake when he translated my program into IBM BASIC (which stands for Beginners All-purpose Symbolic Instruction Code). The screen on which the x, y, h, and v values for my graphing program are erased when the screen turns Orange. Of course, they aren't supposed to be. The correct location for the screen 0,1 is directly after the 'cls' located in line 168 (and directly before the print statements). Line 170 should be deleted from the program completely. Now that you have that information, the program should run more smoothly.

Next time, be with us as the CoCo CORNER delves into how to place characters on the screen using not SET OR PRINT @,BUT POKE! And the amazing calorie counter for those of us who are not mathematical geniuses but who still need to watch our weight. As I've proven myself, remember:

COMPUTERS ARE ONLY AS GOOD AS THAT WHICH IS PUT INTO THEM.

Scott McMahan

CAD/CAM/CIM
"CIM...Confusion"

What is CIM? As an acronym, CIM means Computer Integrated Manufacturing, which I thought originally meant combining computers with the tools of manufacturing (which really in fact is CAM). Instead CIM should have been called either CIB, (Computer Integrated Business) or stay as CIM except with the new meaning Computer Integrated Management. That's because CIM really seems to be linking computers to management more than to the shop floor and is a manager's plan for going beyond optimizing the manufacturing function. Its ultimate role (some say) is to optimize the business. Besides not knowing what the words behind the letters CIM stand for, many people are divided on what CIM actually is. Because of this many people are confused. They have different ideas of what CIM is. Some think it's the factory of the future, a technological wonder that is made up of basically all robots/computers and as few people as possible. Some people believe that CIM is a process where there will be a coordinated participation of computers in all phases of the manufacturing enterprise: the design of the product, the planning of its manufacture, the automatic production of its parts, automatic assembly, and, of course the computer-controlled flow of materials and parts through the plant. There are others who think along the lines that CIM is a long-term business strategy that, to be effective and affordable, must be implemented in stages, and is in fact a strategy and not an end-product. Besides all of this, some people think CIM is reachable now (and have so called examples of CIM in operation in plants. But these have not been very reproducible.), while others think of CIM as a plan, which will be reachable in the future.

To sum this up, two participants in a round table discussion in a recent issue of *Manufacturing Systems*, Warren Hinze, and Tom Carpenter echo my confusion. Warren Hinze said "I don't think there is a good definition of CIM, and that's one of our big problems. Here we are sitting around a table, discussing what CIM really means and that points up the problem. If we can't agree, no wonder people are confused." Tom Carpenter said something to the same effect, "Let's face it,

each of us has an idea of what CIM is but we don't really know what the collective truth is – and that's what we're trying to sell. I don't even think what we're selling is CIM, I think it's CIB – computer integrated business. They've all got to be tied together into that famous misinformation center. We are trying to get profitable performance through the appliance of all this technology."

"CAM...The Solution"

While CIM is still a set of ideas in the planning stages, CAM is real. CAM stands for Computer Aided Manufacturing, which can include programmable automation and adaptive control systems of machines. What CAM really does is link the computer to the means of manufacturing, in effect increasing quality and quantity of the product a company is manufacturing. CAM is really just the latest automation technology.

"CAD...The Catalyst"

CAD can be thought of as one of the starting points for the evolution of CAD/CAM...CIM. CAD stands for Computer Aided Design, which means the use of the computer to assist in the design of an individual part or system. The CAD process involves two basic steps: the design of a model with computer graphics and computer analysis of that model. Many CAD systems also include kinematics programs for animating motion of robot manipulators and other mechanisms. After a part or system is designed with a CAD program one can print or plot it out.

"CAD/CAM...The Liberator"

CAD/CAM is the combination of the electronic drafting qualities of CAD directly linked to the automation of CAM. The digital data that results from the CAD process is directly sent to the computer running the CAM program which then translates the digital data into instructions that make sense to the robot or machine. It used to be that after a product was designed, either electronically or by hand, the blueprint had to be read and translated into instructions by a person so that the worker or machinery could produce the product. In a sense CAD/CAM is

eliminating the middle-person of old.

"Analysis"

In order to understand the source of the confusion surrounding CIM, it is helpful to realize that there are two points of view on what production is; one is from the worker and the other is from management. The actual shop-floor worker's point of view is that of hourly workers doing the "production"; while the manager's understanding of "production" is the things that management does, like planning, directing and controlling the work and the workers, ordering materials, etc. Most of the articles I have read have had the M in CIM from the manager's point of view.

My point of view is that from one who is knowledgeable about computers. When someone who knows a great deal about computers studies CIM, he does not find much that relates to his knowledge of computers. So CIM raises suspicions over whether or not it mainly has to do with computers in manufacturing. Since it does not seem to directly relate to computers in general, it must be something else. And in CIM's case, that turns out to be management.

I had a basic understanding of what CAD and CIM were, but I didn't know what CIM was. It intrigued me because I thought that CIM might be the highest level of technology. I thought CIM would be the combination of computers with machinery to improve production for today's world. The CAD/CAM parts of CIM are this already but the rest of CIM, or what makes CIM different from CAD/CAM first appeared confusing to me. But, now I'm coming to realize that CIM is really a management tool for controlling the work force as if they were part of the machinery. To me this is an attempt to return to the time before unions. Which means that the promise of CAD/CAM for better production is not what CIM is about.

by Michael Hauben

HISTORY OF COMPUTERS
Part V

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1900 PRINT"BECAUSE THE COMPUTER"
1910 PRINT"IS AN ALL PURPOSE MACHINE"
1920 PRINT"THEREFORE THE BASIC PROGRAMMING LANGUAGE"
1930 PRINT"BEGINNER'S"
1940 PRINT"ALL-PURPOSE"
1950 PRINT"SYMBOLIC"
1960 PRINT"INSTRUCTION"
1970 PRINT"CODE":PRINT
1990 PRINT"IS STILL BASIC"
2010 REM THIS VERSION IS FOR AN IBM COMPATIBLE COMPUTER
4900 END
5000 REM SUBROUTINE
5005 LOCATE 20,1
5010 LINE INPUT "Press Return to Go On"; A$
5030 CLS
5050 RETURN
```

John Kemeny and Thomas Kurtz predicted that there would be a need for a generation who understood the actual computer – its limitations and potential. And they created the programming language BASIC to make it possible for students to be able to gain that necessary knowledge. Then when big companies like DEC (Digital Equipment Corp) or IBM refused to develop the home computer there was a body of people able to take on the battles to make the home computer a piece of everyday technology. And it was the BASIC interpreters for both the Altair 8800 and the early Apple computer that made machines viable and attractive to the mass market.

The experience I have had teaching over the past few years is reminiscent of David Ahl's experience with DEC. Computer education has grown to stress word processing, or using a spreadsheet, or some other application which will "be useful in the world of work." At the Michigan Association of Computer Users in Learning Conference that I spoke at in March, 1987, I heard educators say that where their schools used to have 10 programming classes, now there were only two and those were threatened with being cut out. And at some schools, the

BASIC programming language has been cut out altogether. The statement that “people don’t need to learn to program” is reminiscent of Ken Olsen, President of DEC, when he said “I can’t see any reason that anybody would want a computer of his own.” But the computer language BASIC was the basis for the development of the personal computer. Kemeny, in the 1960's explained:

“Only if we manage to bring up a computer-educated generation will society have modern computers fully available to solve its serious problems. While computers alone cannot solve the problems of society, these problems are too complex to be solved without highly sophisticated use of computers.” (*Mam and the Computer,* p80)

Kemeny’s prediction of the value of BASIC proved true. When the big companies wouldn’t develop the home computer, the hackers and hobbyists who had learned from his work went on and took up the challenge.

People who’ve taken my classes have said programming in BASIC has given them a background to go onto robotics or CAD/CAM training or to run a computer driven machine. The weakness of our classes was not that they taught programming in BASIC (or in PASCAL), but that we didn’t understand the history of the fight. For it is only from that history that it will be possible to know how to go forward in developing and applying computer technology. Just as BASIC was the foundation to develop the personal computer – because it succeeded in demystifying and customizing the computer – my prediction is that knowledge of BASIC will be the foundation for people who continue to develop and expand computer technology as it gets applied to machinery. The computer is, as the name BASIC reminds us, an all-purpose machine, not a dedicated word processor or spreadsheet or database. Therefore, to be able to contribute to the development of the computer, knowledge of BASIC or another programming languages will be crucial.

In the early days of the automobile, people needed to know how to drive their cars and how to make the needed repairs. And the driver could determine where he wanted his automobile to go. It wasn’t that his automobile was preset to take him from home to work, or from home to the doctor. He could take his car for a drive in the country, he could use it to visit people off in places where there were yet no roads. The

automobile was flexible enough to be used by its owner in ways that served his life and his needs. Similarly, Henry Ford intended that the automobile serve the farmer – in doing the work the farmer needed done.

The personal computer is a machine that is similarly flexible. Its use can be personalized by each individual or each business. But to do so, one must be able to program it or otherwise to find the software that will accomplish what one wants. The hardware of the computer is far in advance of the software at the current stage of technological development. Henry Ford was able to develop the automobile because there was a milieu of people tinkering with engines and other mechanics necessary for the technological development of the automobile. In a similar way, the personal computer could be developed because there were electronics hackers and tinkers willing to develop and exchange information to make technological development possible.

We are now at a stage where the uses of the personal computer need to be developed. To do so, it is necessary that a broad strata of people, particularly those who will be using computers in their workplaces, be trained in a simple programming language like BASIC. That will begin to make it possible to develop particular uses of the computer. It will also make it possible to troubleshoot the programs that have been developed when something goes wrong.

As David Ahl points out, there is a great deal of misunderstanding about the nature and potential of the personal computer. "We are dealing with one of the most important concepts and tools developed by man," he says, "and yet some continue to hope they can check it off as they do driver education or typing." (*Creative Computing*, Nov. 1984, p. 164)

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