

# AMERICAN ENGINEER<sup>TM</sup>

A PUBLICATION OF THE AMERICAN ENGINEERING ASSOCIATION

© 1994 by the American Engineering Association

FEBRUARY, 1994 Volume 4, Number 1

Editorial:

## Professionalism

We read and hear a lot about professionalism in the various trade journals and meetings and publications of the technical societies, but what makes a professional?

Must we be licensed as a P.E. to be professional? Must we have a degree to be professional? Must we be on the "professional" payroll of our employers, or hold a management position? Does an academic qualify as a professional simply on the basis of being an academic?

Or is there something else which makes individuals professionals? In the strict legal sense, a Professional Engineer is a person who holds a state license. Is it possible to be a professional without either a degree or PE license.

I know several excellent engineers who hold PE licenses who do not have a degree. No, they were not "grandfathered" in because of their years of experience, they passed the state exam. Are these engineers professionals? Are they professional but not engineers?

I know people with neither a degree or license who can design circles around most degreed engineers. Are they any less an engineer or professional than those who hold both? I would hire them before many of the PE's I know.

Webster defines engineering as "The application of mathematical and scientific principles to practical ends, as the design, construction and operation of economical and efficient structures, equipment, and systems." Professionalism is defined as "Professional status, methods, character or standards." (Note in their definition you must only have one of the characteristics mentioned.)

I would submit that a professional need be neither a degreed engineer nor hold a PE license. Presumably the person who holds both has a certain minimum level of technical knowledge and expertise. The degree does not make an engineer nor does the license make a professional.

To me "professionalism" means being able to do the job in a manner consistent with the requirements of the employer, meeting or exceeding local and federal standards for the product, in the most cost effective way without designing in flaws which would endanger the public. Of course one must have the character and the ethics to refuse to "sign-off" on parts or systems which fail to meet the criteria for public safety and quality.

Two of the most shining examples of professionalism and ethical conduct (for some reason the two are always separated, I don't believe you can have one without the other) are Mr. Tommy Grant, President of Grant Fasteners of Houston, Texas and Mr. Roger Boisjoly.

Tommy, as many of our readers will recall, was the prime mover in exposing the fraudulent fastener scandal of a few years ago and Roger Boisjoly was the engineer who insisted the space shuttle Challenger not be launched.

Neither of these people were PE's at the time they made their heroic stands. Roger later became a registered Professional Engineer and is a strong advocate for registration. Tommy Grant is not an engineer and does not have a degree of any kind as I recall, yet both are at the pinnacle of professionalism in their particular fields.

Neither received their ethics from the university and both have paid a far higher price for their stances than most who argue for professionalism would be willing to pay. Neither would or could have morally done it differently.

Is this an argument against licensing or getting a degree or advanced degree? Absolutely not. It is an argument against the staid, academic beliefs and teachings that you must be degreed and/or hold a PE license to be a professional in the field of engineering.

I would urge all young engineers to become licensed. As Roger Boisjoly points out, it will not make you a better engineer or more professional, but it will give you a code of ethics against which any of the really tough decisions may be measured.

At the same time, I would urge those who argue "professionalism" is the answer to all evils to look at the accomplishments and the characters of the non-degreed person applying for a job with your company. Rate these individuals on their performance not on their formal education. Pay them commensurate with their abilities among their degreed peers. Who knows you may even find another Tommy Grant or Roger Boisjoly out there.

Bill E. Reed, AEA President

## Editor's Column

### ILLUSORY JOB ADS

The March and December '93 issues of AE carried examples of what I called "illusory job ads." They were ads that purported to offer a job to the most qualified applicants, but were so detailed that they were really a biography of the applicant that the firm intended to hire in the first place. Also, they offered such a low salary that no one other than the intended applicant (and an unemployed engineer) would even bother to apply. This smacks of immigrant recruiting. Besides that, the employer remained unidentified; the ad listed only a state employment service. Here's another such ad from the same reputable trade paper that ran the previous ads:

**SENIOR ENGINEER.** Design and develop precision co-axial and waveguide slotted line VSWR measurement sets, Microwave Twin Sleeve Tuner Matching Networks and High Power Bias Tees, Instructional Television Fixed Service and Master FM Broadcast Antenna Systems. Use FORTRAN and BASIC to calculate S parameters, Far Field Antenna Pattern and Antenna Gain. Serve as engineering liaison between R&D and marketing to ensure that products are responsive to end-user specifications. Position requires a M.S. degree in Electrical Engineering or Physics and 2 yrs. experience as an Electrical Engineer including experience in programmable electromechanical instruments and components including stepper motor drives. 40- hrs/wk; 8 a.m. - 5 p.m.; Salary of \$37,050/yr. Send resume with SSN to Indiana Dept. of Workforce Dev., 10 N. Senate Ave. Indianapolis, IN 46204, Attn: Gene R. Replogie. Include ID # 3288635 with response. Candidates must be eligible for permanent employment in the United States.

### AEA SUPPORT FROM CONSULTANTS

A consulting engineer named T. Edward Black of 1127 Miller Lane, Buffalo Grove, IL 60089 has the following legend printed conspicuously on his promotional literature: "member AMERICAN ENGINEERING ASSOCIATION." Technical professionals who are AEA members and mention it in the brochures they distribute to the public will also receive mention in "American Engineer," if they mail me a copy of the brochure. There is no charge for this. Mr. Black specializes in electromechanical and machine design and gives AUTOCAD seminars. He can be reached at 708/259-5747.

(Continued)

See Page 3 for letter to  
President Clinton

(“Editor’s Column” continued)

## HIRING ALIEN WORKERS

That’s the title of an article from the Nov. 1, 1993 issue of *LIBNews* that a reader sent me. It tells how the Immigration and Naturalization Service (INS) filed notice of intent to fine the Walt Disney Company \$395,000 “...for alleged violations of rules documenting employee status to work in the US. To get this high figure, the INS used every technical violation they could find.” The article goes on to discuss how an I-9 form must be filled out for all workers hired. With U.S. citizens or ‘green-card’ holders, the procedure is easy. Problems occur, when the employer wishes to hire an alien without a green card.

Often an H-1 visa can be obtained for alien professionals, such as engineers, nurses, computer professionals, etc. These are for 3 years, and may be extended for another three. However the H-1 can also be used to permit a student to change from a student visa to work visa, without leaving the U.S. In applying for an H-1, the employer must state that the company will pay a wage comparable to what a U.S. citizen would receive for the same work. Therein lies a problem.

“American Engineer” has been reproducing job ads that omit the employer’s name and identify only a state employment service. They have hundreds of words covering the job requirements and pay a wage that is obviously sub-standard—obvious to any experienced engineer, but not to the employment service running the ad. I suspect these ads are for aliens, and if no U.S. citizen applies, then the alien gets the job and an H-1 visa. One such ad is above.

A Labor Department application can sometimes be avoided, if the employer shows that the alien has an advanced degree, and his/her entry would ‘benefit the national interest.’ Foreign companies doing business in the U.S. can obtain visas that U.S. companies can not. They can bring in foreign workers for up to five years at a time and can often renew the visa. Also foreign and U.S. companies with offices abroad can bring in managers and employees with specialized knowledge on ‘non-immigrant’ visas. These are temporary, and for a fixed duration, after which the employee must return home.

Have you ever seen the puzzles, “How many animals can you find in this picture?” Well how many ways can you find in the above text to circumvent immigration quotas? The writer of the article that prompted this piece is an attorney practicing in the special fields of immigration, nationality and employer sanction matters. This is not intended as a criticism of his professional activities, but of U.S. immigration laws that are nothing but a sieve for excessive (legal) foreign entry. And all this is totally aside from illegal entry, which exceeds the legal.

## YOUNG SCIENTIST’S NETWORK (YSN)

In the July and December ‘93 issues of *AE*, I mentioned the Young Scientists’ Network as an organization worth watching, since it is trying to do something about the glut of doctoral level physicists. A reader sent me pages from the 10/1/93 issue of *Science* magazine that contain another article about YSN “Young Scientists Network Shakes Up the Establishment.” It seems that two YSN members ran as candidates for the governing board of the American Physical Society (APS). As the article puts it, they “...clawed their way onto the ballot through an electronic mail-based petition drive; managed to win, defeating candidates the APS itself had nominated.” The article goes on to say, “Now that two of their representatives will be sitting on the council, YSN members—who have mostly vented their steam over the electronic bulletin boards—will be in a position to demand action to *reduce the number of graduate students in physics.*” (Italics mine.) YSN also lobbied the Labor Department to drop plans to relax the limit on visas for physicists. They also advocated giving prospective graduate students information packets, detailing the gloomy job prospects in the profession, and pressuring funding agencies to divert resources away from graduate students and towards postdoctoral researchers looking for a job. Not surprisingly, graduate physics departments disagree. They feel that graduate students must observe ‘caveat emptor.’ They also feel that discouraging students might create a shortage in 15 years. Does that sound familiar? I’m still interested in learning a mailing address for YSN.

Congratulations to the two YSN electees—Zachary Levine and Kevin Aylesworth. Would the IEEE benefit from petition candidates on its ballot? You bet your life. Some of the best IEEE presidents were petition candidates who won, like Leo Young, Merrill Buckley and Martha Sloan. Unfortunately the IEEE president serves only three one-year terms on its Board of Directors—as president elect, as president and as past president. When this interval is over, the petition candidate who won, goes out of office and stasis returns. I think IEEE members need to find an endless supply of petition candidates. Whenever there is a petition candidate or petition for an IEEE Constitutional amendment (which can also produce progress), this paper publishes information about him/her or it. If readers would like, I’ll do the same for the other learned societies. Tell me about their efforts.

## QUICK NAME THE FIVE TOP NATIONS OF THE FUTURE

That’s the title of a short article in the Oct. 11, ‘93 issue of *Business Week*. It tells how economists from the Union Bank of Switzerland created a measure of future economic competitiveness, based on such variables as education, R&D and investment in physical capital. Like *Business Week*, you might be surprised by the results. The five top choices were China, Israel, Japan, Korea and Singapore, in that order. The U.S. and Germany were tied for number 19; Mexico was 35th out of 38. Korea was among the top choices, because it invests heavily in physical and human capital and maintains high economic growth. Israel’s position is high, because of its investment in education. Other findings are that Korea could overtake the U.S. in per capita income by 2008, and Japan a few years later, if current trends continue. The report also states that the U.S. economic growth rate should pick up, as it adopts innovations that give other countries their advantage, (if it adopts such innovations). Let’s hope it does.

## THE PRIME MOVER OF THE ECONOMY

An editorial with that title in the Aug. 3, ‘93 issue of *Design News* mentions a report entitled “Employment Multipliers in the U.S.” by the Economic Policy Institute, a Washington think tank. It tells that the report found the average manufacturing job to generate four and a half times as many secondary jobs as the average retail job and almost three times as many secondary jobs as a typical service-sector job. It comments on the effect on the U.S. economy from the drop in manufacturing jobs from 21M in 1979 to 18M today. It’s no wonder that real hourly wages have fallen nearly 9% over the same period. The U.S. auto industry is an even better example of propagating job loss. It generates 691 indirect jobs for every 100 direct employees. Steel and aerospace are also among the leading job creators, and they too have suffered huge layoffs. Whatever economic recovery we’ve had, has not halted the decline in manufacturing jobs. In May ‘93, the U.S. gained 209K service and construction jobs, while losing 39K manufacturing jobs. Multiply the 39K by 4-1/2, and tell me about our economic recovery. The editorial stated that government policy makers need to give top priority to the sector that drives our standard of living. By the way, the Economic Policy Institute published the best anti-NAFTA report I was able to find. Copies of their report on employment multipliers were available in 1993 by phoning 800/537-9359.

## AN ANTI-NAFTA ARTICLE YOU HAVEN’T HEARD

That’s the title of an article in the Nov. 8, ‘93 issue of *Business Week*. It mentions how most trade studies rely on the 19th century theory of free trade, which contains the assumption that capital doesn’t cross borders. Thus the studies miss the flight of U.S. investment dollars that began a few years ago in anticipation of NAFTA passage. (This also explains the vast lobbying effort for NAFTA. Imagine what would have happened to those financial institutions that exported investment dollars and then found NAFTA defeated.) It’s easy to compute the impact on U.S. jobs of outgoing investment. According to Georgia State University economist Donald Ratajczak, \$1B of U.S. investment creates 30K jobs. Assuming \$2.5B capital outflow annually, about 375K new jobs would be lost in five years. This more than wipes out the gain of 170K jobs that Gary Hufbauer and Jeffrey Schott of the Institute for International Economics in Washington predicted would occur in the five years after passage of NAFTA.

Robert Bruce, *AE Editor*

“American Engineer” - February, 1994 - Page 2

# AMERICAN ENGINEERING ASSOCIATION

P.O. Box 820473 • FORT WORTH, TEXAS 76182-0473

TEL. (817) 431-1319

February 10, 1994

The President  
The White House  
Washington, DC 20500

Dear Mr. President:

In preparation for National Engineers Week, celebrated from February 20 to the 26th., you were quoted as saying "America's engineers have much to celebrate." While it may be true that America's engineers may revel in their successes they have now become the forgotten veterans of our technology wars. Corporate down sizing, defense cuts, winning the cold war, the completion of engineering intensive programs and sending manufacturing jobs off-shore has devastated the lives, families and careers of members of the engineering community. I'm sorry Mr. President, but the only celebrations for engineers are "office parties" for those being terminated and more engineering job cuts are pending.

Contrary to conventional wisdom, we do not have an engineering shortage in the U.S. Instead, we are suffering from a glut of engineers and a severe unemployment crisis for engineers of all ages and disciplines. Further, our young engineering graduates, who were encouraged to study engineering, are not getting the engineering jobs for which they studied so hard. This is not something new. The current engineering recession began in 1986 when Congress announced its projected budget cuts. However, spurred by false National Science Foundation engineering manpower shortage projections our nation has increased engineering degree production and is importing more students to meet the demands of our engineering colleges while increasing immigration quotas for those said to have engineering skills. This has further aggravated the employment crisis faced by our engineering community.

Mr. President, we need your help. The other engineering societies, driven by academics concerned primarily about their livelihood of engineering degree production, have failed to address this crisis. As engineers, our concerns are dedicated to the engineering profession and U.S. engineering capabilities and we need your help. I believe the assistance you can provide us will be repaid many times over in enhancing U.S. productivity.

Though, not as obvious as an earthquake, the destruction of engineering careers and our engineering capabilities is just as real.

Respectfully,



Richard F. Tax  
Vice President

enclosures

DEDICATED TO THE ENHANCEMENT OF U.S. ENGINEERING CAPABILITIES

## No Free Lunch

I believe it's time for some professional group to address the issue of unpaid or free overtime from the perspective of the practicing engineer. So without prematurely declaring this as an official AEA position I shall, at least, provide my impressions, make some suggestions and solicit your response on the subject of "Free Overtime."

Early in my engineering career I did my bit of free overtime, but the company had a flexible OT policy and it was a win-win situation. Overtime was balanced by time off and this flexibility satisfied the needs of all concerned. I was doing engineering work, unburdened by trivia, enhancing my engineering experience with drafting, technical and secretarial support. This was the work environment while the demand for engineers was good and engineering companies were thriving.

Later, as a contract or Job-shop engineer, I found that unpaid or free overtime was prohibited because unrecorded working hours would deprive the third party or contract house of their commission. This was unethical and unfair to the members of the contract firm. The arrangement—recording and earning a salary for all hours including the premium OT pay—had no detrimental effects on the client, contract house and engineering relationship and all three parties existed in harmony. Apparently, when the OT issue is agreed upon initially, few problems arise since all parties know exactly what is expected of them.

Unrecorded overtime is detrimental to all involved and the subject arose once in a small company when management decided to assign charge numbers to the various projects. The director of engineering was defining the program to the engineering staff and introducing us to the time sheets to be used. I was curious and asked how and where to record the overtime hours. The response was that overtime hours were not to be recorded. I could not fathom the reasoning for this decision and responded that a failure to record all job related hours would be detrimental to the department and company. Whether overtime was paid or compensated, failure to record all hours would deprive the department of valuable information and make it difficult to estimate future projects and make bidding on them inaccurate. The recorded hours for the current project will be used as a basis or guide for estimating the work load for the next project.

Acknowledging the current learning curve, management might be inclined to make further cuts to the number of man-hours estimated further compounding the problem. Apparently, they were convinced and the final decision was to record all working hours.

Weeks later we were informed that required overtime would be compensated with half-time off or every hour of required overtime would allow the engineer one half hour off. When asked why the short change, the administrative manager's reply was "well, how do we know you are really working?" The subtle message here is—people are responsible for all company activities and faulting the company only shields the problem. One must isolate the problem to the individual faulty component or, in this case, the individual abusive manager.

Falsifying time sheets is also an illegal act. Those who work on government funded projects know that all hours are to be charged to the correct project number and falsifying this information can cost a company its contract and its reputation. We know it's the individual's responsibility to keep their time sheet current to the day and that these time sheets are subject to government audit at any time. I believe this serves as a fine example for all to emulate, so let's use this as a guide, extend its application to all work and make an effort to be accurate.

There is no free lunch and there is no such thing as free overtime. Someone always has to pay. If you put in a Saturday at work you still may have to pay someone to mow the lawn or fix your kitchen sink, so you are paying. Arguments are—You're a professional and on salary. Managers do it, but they get a bonus. I have never heard of an engineer getting a bonus.

One teacher said that "work without pay is slavery." Another asks; what is the difference between an amateur ball player and a professional ball player? Professional ball players get paid and

amateurs do not. Obviously the rationale here is not whether you're licensed, but you are a professional because you do it for a living and therefore you are entitled to be paid.

It's not the few occasional hours of flexible overtime that are of primary concern. It is the abuses by managers that drive their engineers fifty or sixty hours of work for forty hours pay. Every two engineers participating in this fiasco displaces a third engineer and deprives him or her of career opportunities. It has been noted that managers who are short sighted in this way also deprive their engineering staff of adequate engineering support. Engineers involved in free OT spend much of their time performing non-engineering tasks that could be performed by support personnel. Trivia takes time. When engineers spend 20 percent of their time on engineering and 80 percent on non-engineering tasks, then over a ten year period, they will have accrued only 2 years of engineering experience.

To make our case against abusive free OT we should begin by keeping a daily log of ALL hours, record all work hours ST & OT and remember, someone further up the chain of command may just want all of this information. Record the days of the week, whether the OT is mandatory, suggested or inferred and by whom (put that manager's name on your records), enter paid, unpaid and project identification. Test the system. When someone wants you to work free OT get them to make a commitment, a statement or an order. Bring the issue into the open. List all stress related issues, doctors visits, medication, heart burn etc. Keep this record for all days both good and bad. Develop a form to facilitate your effort. Perhaps we can develop or locate some software for our AEA members to utilize.

Don't keep this AEA program a secret. Share this with your associates and the entire engineering community. Let them know that AEA is concerned about their members and their work habits. Give this issue maximum visibility. Write to us about your experience and your suggestions. As funds become available, we shall form an AEA committee to take further action.

*Richard F. Tax*  
Vice President, AEA

## Reach Out

Reach Out to the active volunteers that are making this publication possible. Tell them what you like or what you dislike. Provide them with questions, answers and information or just a hand written note of appreciation. Believe me when I tell you that it is important to let your volunteers know that you care.

Reach Out to the following:

**Bill Reed, AEA President**

P.O. Box 820473, Fort Worth, TX 76182-0473

**Richard Tax, AEA VP, General Information**

PO Box 2012, River Vale, NJ 07675

(201) 664-0803

**Roger Boisjoly PE, Legislation, Ethics and Whistle Blowing**

3047, E. Menlo St., Mesa, AZ 85213

**Robert Bruce**

"American Engineer" publication and related issues

P.O. Box 4493, Great Neck, NY 11023

**Dr. David C. Lewis, Immigration**

609 Sideling Court, Vienna, VA 22180

**Al D'Nak, Contract Engineering**

P.O. Box 465, Plainview, NY 11803

**Richard Plummer, Anti-Discrimination**

P.O. Box 326, Valley Forge, PA 19481

**Robert Rivers, Manpower**

P.O. Box 129, Union, NH 03887

**R.T. Pinkerton, Staff Cartoonist**

Ideas and subjects for new cartoons

P.O. Box 820473, Ft. Worth, TX 76182-0473

## Membership Renewal

Time to renew—The date on your mailing label is the date to renew your subscription, membership and support for the American Engineering Association. Get your renewal in early and save us the time and expense of sending you a reminder. Thank you.

## Betty Vetter Strikes Out Again

The November 12, 1993 issue of *Science* magazine had an article ("Last Hired, First Fired? Minorities Retreat in Defense," page 1125) about the impact of defense-industry downsizing on underrepresented minorities in the technical professions. The article quoted Betty Vetter, executive director of the Washington-based Commission on Professionals in Science and Technology, as saying, "women and minorities are feeling a greater brunt of the downsizing than people who have been in the industry longer—mainly white males."

Contrary to Ms. Vetter's statement, the statistics cited in the article did not indicate that the downsizing has had a really significantly greater impact on minorities. The article cited Martin Marietta, saying that minorities there took only a "slightly" harder hit than whites: minorities are 9.5% of professionals there, but account for 11% of layoffs, according to company data. And the article noted the following about McDonnell-Douglas: "McDonnell-Douglas typically retains employees based on seniority and skills needed by the company. But officials also check to see if slated layoffs hit minorities especially hard; if so, some minorities are retained—even if they have low seniority. That strategy works: From 1991 to 1993, about one third of the professional and technical workers at McDonnell-Douglas lost their jobs or retired early.... But the company doled out the pain to all ethnic groups. In 1991, for example, 4.4% of the company's professional employees and 11.9% of its technical employees were black; today, those figures are 4.5% and 11.1%, respectively." The article claims that Lockheed Corporation and TRW Inc. have made similar efforts to protect their low-seniority minority technical professionals from layoff.

Furthermore, Ms. Vetter ignored the fact that older, mostly white-male technical professionals, because of their generally above-average compensation, often suffer from age discrimination in layoffs. The article noted that McDonnell-Douglas now faces several age discrimination suits from employees over age 55 who lost their jobs in massive layoffs, and that the company recently agreed to settle a batch of these suits at a total cost of \$20 million.

By now, we should be accustomed to Ms. Vetter's tendencies to exaggerate, misuse statistics and jump to conclusions. For example, she once characterized some minor demographic changes as an impending critical "shortage" of native-born white-male workers, quoting the Hudson Institute's misleading statistic that native-born white males would be only 15% of the "net new workers" in the 1990's. Here the ambiguous term "net new workers" actually refers to the numerical differences between workforce entrants and leavers, not the numbers of workforce entrants; actually, non-Hispanic white male workers are expected to be an enormous 32% of new workers in the 1990's. Understandably, the "net new worker" statistics have been repudiated by the U.S. Department of Labor's Bureau of Labor Statistics as indicators of the composition of workforce entrants. Ms. Vetter also made the racist and sexist remark, "we can't make any more white boys." Also, Ms. Vetter once claimed that the comparatively high percentage of black engineering graduates who were female (though well under 50%) was an indication of how few black males were getting engineering degrees!

Not surprisingly, Ms. Vetter has advocated pushing more women and underrepresented minority men into the technical professions. The organization that she heads, which has the neutral-sounding title, "Commission on Professionals in Science and Technology," devotes an inordinate portion of its publications to studies concerning the representation of women and underrepresented minorities in the technical professions. Pushing women and underrepresented minority men into the technical professions might make some sense if there were shortages, but there are tremendous surpluses.

And, as usual, Ms. Vetter singled out "overrepresented" white males as supposed villains squeezing underrepresented minorities and white women out of the technical professions. She placed none of the blame on Asian-Americans, even though, according to a pie-chart in the *Science* magazine article, they were 23.9% of Ph.D. engineers in the workforce in 1991, far exceeding their percentage of the overall workforce.

*The Phantom Engineer*

Page 5 - February, 1994 - "American Engineer"

## Reader's Voice

*This column in the "American Engineer" is for readers to voice an opinion about issues that affect the professional life of an engineer or other technical professional. Readers are encouraged to write AEA with their professional concerns. Each submission should include the name, address and phone number of the writer. Except for short excerpts, we'll publish the writer's name, city and state (unless the writer requests anonymity). In that case, we'll publish initials, city and state. Let's hear from you.*

*Editor: I've delayed in publishing some interesting correspondence from M.S. Farber, so here are two letters.*

From M.S. Farber of Hicksville, NY: - "While a number of articles in the Oct. '93 issue of AE blame immigration for some, if not a majority, of the engineering employment problems, I think that there is a more basic reason. Since I started my career as an applied physicist in 1943, I've had a chance to observe the many changes occurring over the years. The thing that strikes me as the major cause of employment problems is the proliferation of engineering schools.

"The first apparent surplus occurred in the early 70's. This was shown by layoffs and by the difficulty engineers encountered in finding jobs. This would mean that the number of engineers had equalled or surpassed the number of engineering jobs. It did not last, because of rapid expansion of jobs in the defense sector. As the number of trained engineers increased, some of these went into the academic community to staff new engineering schools, which in turn provided an expanding production of engineers. I would suggest that all the engineering schools established from 1969 (perhaps as early as 1965) are putting their own survival in this economy ahead of their students, who will find that there are too few real engineering jobs available!"

From M.S. Farber: - "One area that experienced engineers enter is that of consulting. Recently I attended a lecture given by heads of small companies on the subject of partnering. When I heard the talks, I became upset.

"There were two power supply companies, one specializing in high voltage; the other, low voltage. Both had gone to the state university to get research done in phase modulated switching supplies. The speakers extolled the free work they'd obtained from the use of graduate students.

"In the audience were a number of consultants whom I knew from IEEE activities, like the Consultants Network. I was surprised that none of them rose to protest the competition given to them by the state university; they said nothing publicly about the use of "slave labor," a term they used later in private conversation.

"I would suggest that engineering schools are not only over-producing engineers, but are also competing with them for jobs that could be done by companies or consultants."

*Editor: Here's a letter from L. Siphema to AEA Publications Committee Member, Roger Boisjoly, about the Pension Portability Improvement Act, HR1874. In the Oct. '93 issue of AE, I recommended that readers write their Congressmen to back HR1874. Mr. Siphema disagrees. I am trying to assemble more facts about the Act and about the formulas referred to in his letter, that are used to compute lump-sum pension payments. These formulas are contained in two reports in the Federal Register and in further correspondence from Mr. Siphema that I'm now examining. I see two issues: the formulas for pension disbursements contained in existing rules, and the formulas in HR1874, which failed to pass in the 1993 Congress. The issue is still current, because HR1874 could be reintroduced in the 1994 session of Congress.*

From L. Siphema of St. Paul, MN: - "This letter conveys to AEA the new Pension Benefit Guaranty Corporation (PBGC) formulas for valuation of pension plan benefits.

"BACKGROUND - The Pension Portability Improvement Act of

(Continued)

*("Reader's Voice" continued)*

1993, HR1874, is indefinite and mathematically ambiguous. It gives unlimited approval to PBGC formulas for lump sums. Instead, HR1874 should identify and document the lump sum formula it cites. On Jan. 19, '93, PBGC issued proposed rules changes, which included new formulas for valuation of pension plan benefits.

"The PBGC described lump sums as 'participant lump sum expectations,' and was concerned that plan participants not be surprised by reductions in their lump sums. However, plan participants insist that lump sums are an alternate form of payment of a benefit which their employer contractually agreed to provide. Reduction of lump sums by arbitrary rule changes is theft from plan participants. On Sept. 28, '93, PBGC issued final new rules, which also included new formulas for valuation of pension plan benefits. The final new rules were to be effective on Nov. 1, '93.

"ACTION REQUESTED - The AEA should alert and advise its members concerning the new PBGC rules. Questions AEA should answer should include the following:

1. How are member lump sums affected?
2. How can members who were underpaid lump sums under pre Nov. 1, 1993 rules, due to using immediate in place of deferment factors  $K_1$ ,  $K_2$  and  $K_3$  recover their underpayment if the revised code does not define deferment factors?
3. How will members' lump sums be affected if PBGC begins using new formulas?
4. How are taxpayers affected by the new PBGC rules? That is, how is the solvency of PBGC affected, if the same formula is not used to value a benefit, when it is expressed as a lump sum and when it is expressed as an annuity (monthly) payment?"

From L.F. of L.A.: - "The Dec. 1, '93 issue of the *Chronical of Higher Education* (page A43) lists the following fields as having the highest percentages of the foreign students in U.S. high education institutions in 1992-93: business - 20%, engineering - 18%, physical and life sciences - 9%, mathematics and computer science - 8%. Since engineering was the most popular major among foreign students for several decades, a great deal has been made of the fact that business education recently passed engineering in popularity among foreign students. However, as the above percentages indicate, engineering's popularity among foreign students is still formidable. Furthermore, if the other technical fields—the physical and life sciences, mathematics and computer science—are combined with engineering, the total comes to about 35%, far surpassing the percentage studying business (20%). These percentages should be of great concern to U.S. engineers, since the Immigration Act of 1990 made it much easier for foreign students to stay here after graduation."

From T. Gawne of Silver Spring, MD: - "The free trade agreement with Mexico (NAFTA) has passed, and America is now part of a corrupt, third-world oligarchy, much of whose economy is based on child labor, and whose population will soon exceed our own. We must learn from this defeat. First I propose that we all write our members of congress who voted against NAFTA and thank them. NAFTA has shown us who our friends really are. The payoffs for NAFTA are not over. Expect a lot of corporate PAC money going to NAFTA supporters, and more skewed media coverage:

"(Pro-NAFTA = statesman; Anti-NAFTA = demagogue). The members of Congress who voted against NAFTA may end up needing not just our votes, but our active support as well (to get reelected). Not only did the media present 10 pro-NAFTA articles for every one against, but certain points were simply not allowed in the debate. You didn't hear about Mexico's skyrocketing population. You didn't hear about child labor, or the potential for Mexican companies to import unlimited numbers of 'guest' workers.

"Continue to write your elected officials, but writing the established media is a waste of time.

"We need to build new institutions that will at least allow a full discussion of the issues. You didn't hear much about NAFTA's immigration provisions from the IEEE! For our part, let's work on building up the AEA. Sign up your colleagues; xerox copies of the newsletter, and mail them out.

"We have arrogantly assumed that the laws of supply and demand which apply to 'unskilled' workers do not apply to us (engineers). Wrong! Skyrocketing populations of the third world can eventually be used to bludgeon even the most highly trained engineer into poverty, just as easily as anyone else.

"We should consider forming an engineer's union, and maybe affiliating with AFL-CIO. (If better allies are available, let me know.) Like autoworkers and plumbers, we are really just people who have to work for a living, and our interests are the same. Such a move would finally give us some visibility, and lay to rest once and for all the myth that a 'global economy' represents a shift from unskilled to skilled jobs, because it is really a shift from high to low wages."

*Editor: Mr. Gawne mailed us a list of Representatives who voted against NAFTA, which is reproduced in this issue.*

*Robert Bruce, AE Editor  
P.O. Box 4493, Great Neck, NY 11023*

## U.S. Representatives Who Voted Against NAFTA

**Alabama:** Beville, Browder, Cramer, Hilliard, Everett

**Alaska:** Young

**California:** Condit, Dellums, Dixon, Edwards, Filner, Hamburg, Harman, Lantos, Martinez, Miller, Schenk, Stark, Tucker, Waters, Waxman, Woolsey, Doolittle, Hunter, Pombo, Royce

**Connecticut:** DeLauro, Gejdenson, Kennelly

**Florida:** Brown, Deutsch, Peterson, Thurman, Bilirakis, Canady, Diaz-Balart, Ros-Lehtinen, Stearns

**Georgia:** Bishop, Lewis, McKinney, Collins, Kingston

**Hawaii:** Abercrombie, Mink

**Idaho:** LaRocco, Crapo

**Illinois:** Collins, Costello, Evans, Gutierrez, Lipinski, Poshard, Rush, Sangmeister, Yates

**Indiana:** Jacobs, Long, McCloskey, Roemer, Sharp, Visclosky, Burton, Myers

**Kansas:** Slattery

**Kentucky:** Barlow, Natcher, Bunning, Rogers

**Louisiana:** Fields, Tauzin

**Maine:** Andrews, Snowe

**Maryland:** Mfune, Wynn, Bartlett, Bentley

**Massachusetts:** Frank, Moakley, Neal, Olver, Blute

**Michigan:** Barcia, Bonior, Carr, Collins, Conyers, Dingell, Ford, Kildee, Levin, Stupak

**Minnesota:** Minge, Oberstar, Peterson, Sabo, Vento

**Mississippi:** Taylor, Thompson

**Missouri:** Clay, Danner, Gephardt, Volkmer, Whaet, Talent

**Montana:** Williams

**Nevada:** Bilbray, Vucanovitch

**New Hampshire:** Swett

**New Jersey:** Andrews, Hughes, Klein, Menendez, Pallone, Payne, Torricelli, Saxton, Smith

**New York:** Ackerman, Engel, Hinchey, Hochbrueckner, LaFalce, Maloney, Manton, McNulty, Nadler, Owens, Rangel, Schumer, Serrano, Slaughter, Towns, Velazquez, Gilman, McHugh, Quinn, Solomon, Walsh

**North Carolina:** Clayton, Lancaster, Watt, Taylor

**North Dakota:** Pomeroy

**Ohio:** Applegate, Brown, Fingerhut, Hall, Kaptur, Stokes, Strickland, Traficant, Hoke, Regula

**Oklahoma:** Inhofe **Oregon:** DeFazio, Furse

**Pennsylvania:** Blackwell, Borski, Coyne, Foglietta, Holden, Kanjorski, Klink, Margolies-Mezvinsky, McHale, Murphy, Murtha, Santorum, Shuster, Weldon

**Rhode Island:** Reed

**South Carolina:** Clyburn, Derrick, Inglis, Ravenel, Spence

**South Dakota:** Johnson

**Texas:** Brooks, Gonzalez, Green, Hall, Washington, Wilson

**Utah:** Orton

**Vermont:** Sanders

**Virginia:** Boucher, Byrne, Scott, Siskiy

**Washington:** Unsoeld

**West Virginia:** Mollohan, Rahall, Wise

**Wisconsin:** Barca, Barrett, Klezka, Obey

"American Engineer" - February, 1994 - Page 6

## The End Of Jobs

It was just a little more than a year ago, at the Democratic Convention in New York City, that Bill Clinton, in accepting his party's nomination, called the creation of more and better jobs "the work of my life." The unemployment rate was 7.8 percent, and, if elected, Clinton would do something about it: a four-year, \$200 billion program of spending on cities, infrastructure, education, and worker training, including \$20 billion annually to "rebuild America." The country would no longer have a president who, in Clinton's words, was "willing to do anything to keep his job, but nothing to help average Americans keep theirs."

Earlier this summer, a House-Senate conference agreed to add to the fiscal 1993 budget \$170 million for summer jobs for teenagers and another \$50 million to expand a training program for people under thirty. Clinton's job-creation proposal—the billions in federal funds to rebuild America—had come to this. The true "stimulus total," according to the *Wall Street Journal*, would amount to only \$660 million, despite the fact that Clinton was presiding over a still troubled economy in which the official unemployment rate hovered at 7 percent and the annual rate of increase in employment was sputtering at less than 1 percent. Another phrase from Clinton's campaign comes to mind: outside an unemployment office in Toledo, just weeks before election day, he had spoken of joblessness and the lack of new good jobs as problems with "no end in sight." He would not say that now, but he could.

Of course, the burden is not Clinton's alone—or America's, for that matter. Across the planet, the shrinking of opportunities to work for decent pay is a crisis yet to be faced. The problem is starkly simple: an astonishingly large and increasing number of human beings are not needed or wanted to make the goods or to provide the services that the paying customers of the world can afford. Since most people in the world depend on having a job just to eat, the unemployed, the unemployable, the underemployed, and the "subemployed"—a term used to describe those who work part-time but need to work full-time, or who earn wages that are too low to support a minimum standard of living—have neither the money nor the state of mind to keep the global mass consumption system humming. Their ranks are growing so fast that the worldwide job crisis threatens not only global economic growth but the capitalist system itself.

In 1914, Henry Ford raised the pay of his workers enough so that they could buy Fords. The *Wall Street Journal* immediately denounced the cranky automaker for committing an "economic crime," but Ford understood that, as he once put it, "if you cut wages, you just cut the number of your customers." Now, however, the social system based on high-volume assembly-line production employing well-paid workers who can afford to purchase what they make is fast disappearing. Since 1989, the United States has lost 1.6 million

manufacturing jobs, and such losses will continue to mount. At the very moment the tax-and-cut Democrats and cut-and-cut Republicans were winding up their debate on the Clinton stimulus package, Proctor & Gamble, the nation's largest maker of household goods, and the employer of 47,600 workers in the United States, acknowledged that its "Strengthening Global Effectiveness" strategy (the company also employs 58,600 abroad) would mean the loss of up to 10,000 jobs.

Thanks to automation, the increasing use of subcontractors, suppliers, and temporary workers (many of whom cut, sew, and punch data at home), and the reorganization of the workplace in order to provide greater output per worker, steady jobs for good pay are becoming poignant memories or just dreams for more and more people. This is true not only in factories but in banks, stores, insurance companies, brokerage houses, law firms, hospitals, and all sorts of other places where services are rendered. Between 1979 and 1992, the Fortune 500 companies presented 4.4 million of their employees with pink slips, a rate of around 340,000 a year.

As factories moved out of the United States in the 1970s and 1980s, the Panglosses of the day called it progress and celebrated the transition to a "service economy" that would provide an ever-expanding source of jobs at every level of society. The dirty factories would move abroad and the nasty work would be done in the poor countries. The United States would invent the software on which the new global system would run, and highly paid lawyers, accountants, deal makers, and other servants of corporations and rich investors would somehow generate enough economic activity to keep armies of fast-food handlers, health-care aides, and clerks gainfully employed. In the era of Reagan prosperity, between 1982 and 1988 (already of dim memory), 15 million new jobs were created. The mushrooming service sector, however, turned out to be vulnerable to the same fierce competition that has shriveled factory payrolls in the United States and caused real wages in manufacturing to drop 9 percent since 1973. Indeed, there are by and large more low-wage jobs today in the service sector than in manufacturing.

To be sure, as Secretary of Labor Robert Reich has frequently noted, manipulating word-processed data of symbolic value—masterminding multibillion-dollar foreign-exchange transactions, say, or creating bond prospectuses—is now one of the world's most profitable activities. Armies of service providers of all sorts are employed by huge global networks—ad agencies, law firms, investment houses, media complexes. Organizing and communicating data in novel ways or concocting exciting new dishes for expensive restaurants can be extremely lucrative. But punching data and washing pots are not. The global tourist industry is now the world's biggest employer; one out of every fifteen workers across the planet spends the day transporting, feeding, housing, herding, cosseting, or amusing tourists. But most do not make enough money to eat

**I am concerned about my career and U.S. Engineering capabilities.  
Please enroll me as a member of AEA at the following grade.**

SPONSORING MEMBER \$100\_\_\_ SUPPORTING MEMBER \$50\_\_\_ MEMBER \$30\_\_\_

Name: \_\_\_\_\_ U.S. Citizen: \_\_\_\_\_  
(Please Print)

Address: \_\_\_\_\_ Apt: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Work Phone: \_\_\_\_\_

Engineering Discipline: \_\_\_\_\_ Industry: \_\_\_\_\_

Please enclose check or money order and send to: AEA, Box 820473, Fort Worth, Texas 76182-0473

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

All members receive a subscription to the AEA publication "American Engineer."

Annual membership begins on receipt of Application.

Dues in the AEA are tax deductible.

Page 7 - February, 1994 - "American Engineer"

*("The End Of Jobs" continued)*

even once at one of the tables they serve and clear.

Job insecurity, however, is no respecter of class. In 1991, overall unemployment in the United States jumped 15 percent as companies "down-sized" in the name of efficiency and an increase in productivity. But the unemployment rate for managers rose 55 percent. As the organization of the world's work shifts, more and more of us, from wastebasket emptiers to CEOs of multinational corporations, are waking up to the fact that we are swimming in a global labor pool.

It turns out that just because we have lived and worked in Connecticut all our professional lives is no guarantee that our Connecticut-based employer will not hire a Malaysian or a Russian to do our job. Actors, cameramen, engineers, lawyers, biologists, and medical researchers can be found in Hungary, Russia, or Singapore for a fraction of a U.S. salary. Multinational companies say that Indian programmers and Irish insurance examiners are usually more productive and reliable than workers in the home country. Metropolitan Life employs 150 workers in a village in County Cork to examine medical claims from all over the world. Irish workers cost 30 percent less than U.S. workers, and because work is so scarce in Ireland—a country of 1.1 million jobs and 3.5 million people—there is not much turnover.

The dimensions of what Marx called the reserve army of the unemployed are now staggering. According to the International Labour Organization, an estimated 47 million additional job seekers enter the already overcrowded labor market each year. Approximately 38 million of them are in Asia, Africa, and Latin America. With the exception of Japan, of two industrializing nations in Asia (South Korea and Taiwan) that have been highly successful in creating jobs and building a middle class of two commercial city-states in the same part of the world (Hong Kong and Singapore) that are free from typical Third World population pressures, and of China, where the majority of people still farm and the industrial economy is growing at an incredibly fast rate, Asia is struggling with chronic unemployment problems. And Africa and Latin America face an employment crisis on a scale far beyond anything Americans and Europeans encountered during the Great Depression. This includes a number of nations that are aggressively pursuing strategies of industrialization.

*To be continued.....*

*By Richard J. Barnet*

*Richard J. Barnet is a senior fellow at the Institute for Policy Studies, in Washington. "Global Dreams: Imperial Corporations and the New World Order," co-authored by Barnet and John Cavanagh, will be published early next year by Simon & Schuster.*

*(This article is reprinted with permission from the Sept. '93 issue of "Harpers Magazine.")*

## Editorial

### A New Look At Engineering

In "Forefront," a publication from the University of California at Berkeley College of Engineering, Berkeley Chancellor Chang-Lin Tien, a mechanical engineer, talks about the state of engineering education in a piece entitled "Engineering for the Next Millennium":

"We must reject the stereotype that engineers only do technical work. We must apply our engineering expertise to related fields and bring other fields to bear on our own. In the 21st century, America will need more politicians who are engineers. America will need more corporate managers who are engineers. America will need more teachers who are engineers."

From a cynic's point of view, it sounds like the college is warning students that they will have difficulty finding jobs as engineers after they graduate, so they had better look into other areas for a successful career in case they do not find a job in engineering.

The engineering profession is going through major changes as the cold war becomes a memory, as government spending winds down, and as the economic recovery from the recent recession continues to lag. In fact, there are some who say that we have already seen the recovery, and what you see is what you get. The bottom line is that today's economy may not change significantly for quite some time. Many engineers today are pursuing careers outside of their field, and engineering jobs may never proliferate as they did, say, in the early 1980s. No longer is a bachelor's degree in engineering a guarantee of an engineering job, either in industry or for the government.

But for the long range, Chancellor Tien casts an interesting and certainly more positive slant on engineering. He considers it not as a limited, circumscribed vocation, but as a basic education for the world of the future. It's difficult to disagree with him that more people with an engineering education are needed to spread out into such professions as corporate management, teaching, and even, as difficult as it is to say, politics. And there's always the strong chance that many new engineering jobs will emerge, and that many engineering graduates will practice as engineers.

Technology is the driving force behind more aspects of business with every passing day, and the engineering curriculum is an excellent preparation for jobs related to technology. The engineering curriculum also is one of the more challenging of all college programs, and anyone who successfully completes it is certainly someone who is prepared to handle almost any job. Perhaps it is time to broaden the sights of engineering students and tell them they can take what they have learned and apply it to another field.

*Steve Scrupski, Editor-in-Chief*

*(Reprinted with permission from "ELECTRONIC DESIGN", August 5, 1993. Copyright 1993, Penton Publishing Co.)*

#### BOARD OF ADVISORS

Hon Tom Vandergriff, *Former Member of Congress*  
Jerome M. Zeifman, *Former General Counsel*  
*House Judiciary Committee*  
Johnny W. Richards, II, *Attorney and Counselor at Law*  
Tommy Grant, *President Grant Fasteners*  
Maj. Gen William P. McBride, *U.S. Air Force Ret.*  
Ms. Nell E. MacCracken, *Consultant*  
Al D'Nak, *President Alnak Publishers*  
Norman G. Comish, *Past President*  
*Nat'l Council Industrial Defens*

#### PUBLICATIONS COMMITTEE

Billy E. Reed, *President*  
Richard F. Tax, *Vice-President*  
Robert Bruce, *Editor*  
Michael Perugini, *Publisher*  
Roger Boisjoly, *Legislation*  
David C. Lewis, *Immigration*  
Al D'Nak, *Contract Engineering*  
Richard W. Plummer, *Anti-Discrimination*  
Robert A. Rivers, *Manpower*  
R.T. Pinkerton, *Staff Cartoonist*

AEA  
P.O. Box 820473  
Fort Worth, TX 76182-0473  
(817) 431-1319

FIRST CLASS  
U.S. Postage  
PAID  
Permit #32  
Mt. Arlington, NJ 07856