ChE views and opinions

The AIChE President Speaks...

FINAL "GOALS" REPORT

MAX S. PETERS

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With only minor changes, the Final "Goals of Engineering Education" report is identical to the Interim "Goals" report. The AIChE response to the Interim report was published in the August, 1967, issue of *Chemical Engineering Progress*, page 36. The CEP statement clearly represents my response to the Final goals report. However, at the time the CEP statement was prepared, we had been led to believe that our statement would be included as a permanent part of the Final report. This did not occur, and it is very interesting to note that there is no specific reference in the Final report to any of the many articles published which gave dignified and responsible disagreement with the major recommendations of the Preliminary and Interim reports.

The Goals report contains much useful and interesting data along with analysis and recommendations which, as the Preface clearly states, represent the views of three individuals. Most of the recommendations are generalizations with which no one could reasonably disagree. However, the recommendations relative to making the master's degree the first professional degree in engineering, the desirability of encouraging general engineering degrees, and the accrediting by college rather than by curricula are all, in my opinion, undesirable goals.

I think we should view the Goals report as a collection of data and a representation of the views of three individuals. Some of it is good and some of it is bad. In any case, it is interesting reading—and I now suggest that all of us stop wasting our time on the subject—As educators, let's get back to the serious and important business of worrying about our teaching and our students.

The Drift And The Draft

Why A Scholarship Program In Chemical Engineering?

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Why do we operate an industrial scholarship program for freshmen in Chemical Engineering at Montana State University? This question is asked by citizens and taxpayers who note that overall college enrollments are bulging. At an institution that has an avowedly "publish or perish" policy where this sort of activity is going to make few faculty Brownie points, this is a good question. The answer can be found from the following equation:

$$A / B = C / D$$

A. Shirer, W. L., *"The Rise & Fall of the Third Reich,"* p. 348, Simon & Schuster, New York, N. Y., with permission of publisher.

"After six years of Nazification the number of university students dropped by more than one half—from 127,920 to 58,325. The decline in enrollment at the institutes of technology, from which Germany got its scientists and engineers, was even greater—from 20,474 to 9,554. Academic standards fell dizzily. By 1937 there was not only a shortage of young men in the sciences and engineering but a decline in their qualifications. Long before the outbreak of the war the chemical industry, busily helping to further Nazi rearmament, was complaining through its organ, *Die Chemische Industrie*, that Germany was losing its leadership in chemistry. Not only the national economy but national defense itself was being jeopardized, it complained, and it blamed the shortage of young scientists and their mediocre caliber on the poor quality of the technical colleges."

B. Johnson, T. M., *"Secrets & Spies—The Silence of* 600,000," p. 527-8, Reader's Digest Books, Pleasantville, N. Y., with permission of publisher.

"In the spring of 1945 the Allies were sweeping over Germany. Among their orders were, 'Get to the Hohenzollern area first and fast. Snatch the scientists and their secrets before they can escape'. . . . Suddenly came the biggest scare since D-day: new aerial photographs showing slave-labor camps, power lines and a huge industrial site rising with incredible speed near the village of Bisingen. Then the Berlin radio announced that the Germans already had the atom bomb! In a supreme effort to pierce the veil, scientists, sleuths and soldiers dashed toward Bisingen. There they encountered disappointment, but also immense relief; the big new plant was not designed to make atom bombs but to extract oil from shale. They pressed on to other installations. At Thalfingen, sitting at his desk in a large laboratory, was Otto Hahn, who had first smashed the uranium atom, and with him were a score of other scientists. The Nazis denied that they had ever tried to make an atom bomb. They said, too, that their papers had been destroyed. But one famous scientist greeted the Americans with "I've been expecting you," and handed them summaries of his work. Other valuable papers were fished from a cesspoll where they had been concealed in an oil drum. Finally a few German scientists persuaded others to come clean. Then they revealed their laboratory supplies—small amounts of heavy water, hidden in an old mill; and of uranium oxide, buried in a field; and at last, in a big tunnel deep in the mountainside, their "pile". It was a climax of irony. Their "uranium machine" or "pile" was a dud. It could not set up or maintain a chain reaction. The Germans could not produce plutonium and did not believe it feasible to separate U-235 from U-238. (We had found three ways to do it.) They had one cyclotron; we had more than thirty. Germany's best atomic scientists had not emerged from the experimental stage. Even after they were captured, they believed we were so far behind them that we would want to imitate their priceless work."

C. Burtis, T. A., *The Brain Drain—Home Grown, Chem. Engr. Prog.*, 64, 35 (1968), with permission of publisher.

"Between 1961 and 1965 the total number of bachelor's degrees granted to male graduates in the United States increased from 256,000 to 320,000, a compounded growth rate of 4.4%. Within the same period the number of bachelor's degrees in engineering increased only from 35,700 to 36,600—a growth rate to all intents and purposes of zero. . . . If the technological and scientific strength of the United States is so great as to cause concern abroad, if it is so important that our own government relies on this capability for the solution of problems in space, defense, transportation, environmental control, and other public problems, if industry is relying on science and engineering for future growth, some steps must be taken to see that the talent necessary to meet these objectives becomes available. That it is not is clearly evident. One need only look at the job opportunity ads in any of the journals, including our own. The accepted estimate is that as against the 75,000 job openings for engineers which appear every year, there is available in this country only a total addition of 45,000 trained men."

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D. Solve for D.

EPILOGUE

On July 1, 1968 the Selective Service laws were modified to do away with deferments for all graduate students. The special category of essential activities and critical occupations was also abolished and all this had the blessing of the National Security Council. The country was on an equality binge and it was deemed politically expedient to treat Ph.D. engineers and scientists in exactly the same manner as high school dropouts. Graduate school enrollment dropped precipitously. For example, the number of Ph.D. chemical engineers produced dropped from 400 in 1967 to 150 in 1971. In the spring of 1972 the Russians launched and assembled a large orbiting space platform. The Kremlin advised President Johnson that it contained a thermo-nuclear device capable of irradiating and destroying the eastern third of the United States. Several of our Poseidon submarines were blown up while on patrol. The Russians claimed they had been violating their coastal waters and that the feat was accomplished with a new underwater missile. President Johnson flew to Moscow and conferred at the Kremlin for a week. On his return, he announced that he had obtained "peace for our time." He immediately ordered the closing down of all U. S. military establishments in the Eastern Hemisphere and the recall of all Poseidon submarines to their U.S. bases. He assured the country in a nationwide TV broadcast that an era of true world peace now lay ahead.