on. All the rest would go to Germany. Absolutely no provision was made for the feeding of the rest of the Russian people in the conquered territory. They would just starve to death.

At the present time, ask any Nasserite, Jordanian or Syrian what are his country's plans for Israel. They will tell you frankly that it is their national policy to push Israel into the sea.

During our lifetime too, you and I have seen a number of examples of politicians paying little heed to their nation's scientific and technical capability until they were in desperate straits and then calling for the technically impossible. On May 10, 1940, the battle of France began. The French people had been assured for twenty years that their Maginot Line was the finest defensive system in the world and that the country was in no danger. Actually French technology had progressed very little since World War I. Five weeks later with the Nazis storming the gates of Paris, Premier Paul Reynaud issued his plaintive call to President Roosevelt for "clouds of airplanes."

Fortunately for civilization, it wasn't only the "good guys" that have let their technology slide. In 1942, German submarines sank 6,250,000 tons of Allied shipping, a tonnage far beyond the capability of western shipyards to replace. Had this rate continued, Britain would surely have been brought down. But in 1943 the U-boat losses zoomed and Allied ship sinkings miraculously dropped. Why? Because a few young American and British engineers applying new knowledge of radiant heat transfer had developed radar. This enabled Allied aircraft to locate and destroy the U-boats long before they got close to the convoys. Admiral Doenitz at first suspected treason but when he finally learned that it was radar, he withdrew the U-boat fleet. In late summer however, Hitler insisted that German bravery could overcome American technology and ordered the fleet to sea again. In the last four months of 1943, the Nazis lost sixty-four submarines while sinking only sixty-seven Allied vessels. This loss ratio spelled doom for the U-boat warfare and settled the Battle of the Atlantic.

By the spring of 1945, the Third Reich was in its death throes. Both the eastern and western borders had been crossed by the Allies and the German cities were mere rubble heaps. About 8-million Germans had been killed, virtually an entire generation. What was the word from Hitler under those circumstances? His scientists and technologists led by Werner Von Braun, were going to save Germany yet with their V-1 flying bombs and V-2 rockets.

Frankly, Senator Metcalf, I am concerned that the policies established last July 1 will cause the United States to lose its technological lead. That is a situation that cannot be quickly remedied. It takes a minimum of eight years from the time we interest a high school student in science or engineering until he is awarded the PhD. No crash program, no large infusion of money can speed up this process. Can we gamble with our national safety? In this nation of 200-million people, does the continued training of a few thousand engineers and scientists in critical skills and essential occupations really upset greatly the general policy of fairness to all?

May I have your permission to publish your letter of August 1 and this reply? LLOYD BERG,
Montana State University

The Senator has the last word:
Dear Dr. Berg:

I have long talked about the need for scientists and engineers in the National Defense Education Act. I deplore the fact that $6 billion reduction of the budget has cut out essential research and development programs, of the National Institutes of Health and the National Science Foundation and pure research and development as far as the military is concerned.

Experience has shown that a statement that engineers will never return for additional study is not an accurate one. The GI bill and now the new bill for Korean and Viet Nam veterans has attracted thousands of boys back to advanced studies, including the engineering field.

I don't want to enter into an extended debate with you on the question; I feel that your statement in the article about an "equality binge" is unfortunate and hope that you will agree that essential equality here is not a sacrifice of life itself and if we are going to demand that sacrifice of young men we must demand it of them whether they come from homes where their parents ar rich and affluent or whether they come from homes where they have not had either the educational or cultural opportunities to attain the status of a graduate student in science or mathematics. We need more equality, not less.

Yes, you have my permission to publish my letter of 1 August, if it is published in full together with this letter.
LEE METCALF
U.S. Senator from Montana

Summer Issue
Editor:

From cover to cover, I read it! I don't do that for very many publications, but your Summer 1968 issue of Chemical Engineering Education was outstanding. Please accept my congratulations.
Joseph J. Martin
University of Michigan

Editor:

That Summer issue of CEE! A splendid job. Everything in it is interesting and valuable.

Olaf Hougen has countless admirers who will enjoy reading about him.

Keep up the good work.
M. C. MOLSTAD
University of Pennsylvania

ACKNOWLEDGMENTS

to get in there and work with these students," not much can be done. I do not mean mollycoddling of students. Some people may say, "He's advocating leading them around by the hand." No, I do not mean this. When a boy comes in and says: "I've got six job offerings. How about telling me about these companies?"—or he says: "Gee, I'm thinking about going on to grad school, but I really don't know."—or he says: "My freshman math instructor has failed 95% of the class." —I believe the professor ought to be doing something. I think that he ought to be asking questions. He ought to act as the inspector general, if nothing else.

In other words, the professor ought to be concerned and interested in the student, and he ought not to be concerned as much in pleasing various administrators. Doing what is right for the students is much more important than fulfilling a set of paper regulations. Let me also say that I have written quite a few papers. I have time to participate in national meetings, and I get quite a bit done. But, I have never shut my door to a student. I do not think anybody on my staff at Denver has either. I think this should be the tenor at all schools. If this forces one to work in the evening or on week ends, then one must. But advising a student who might be standing out in the hall with his knees shaking—a freshman or sophomore—is much more important than writing any paper or doing anything else. I maintain that if you inspire the student with the right attitudes he will continue to grow when he goes into industry. He will take off in the right direction, and he will be primed to walk the second mile that Dr. McKetta talked about.

ACKNOWLEDGMENTS

ChE problems for teachers

We continue with the thermodynamic problems and solutions prepared by Professors Irey and J. H. Pohl at the University of Florida.

1. An incomplete equation of state for a substance with the work modes $-EdZ$ (associated with charge) and PdV (compressibility) is written as;

$$\frac{V-V_0}{V_0} = \beta T + K Z P$$

a. Determine the electric potential, E, as $E = E(V,T,Z)$.

b. Calculate the difference in internal energy

$$u(T,V,Z) - u(T,V_0,0)$$

due to changes in volume and charge.

c. If $C_{v,z}(T) = C_{v_0,0}(T)$
$$\begin{array}{c} v = v_0 \\ z = 0 \end{array}$$

find $C_{v,z}(T) - C_{v_0,0}(T)$.

ACKNOWLEDGMENTS