

THE RESPONSIBILITY OF AN ENGINEER

I once wrote a book and ended it with these lines: "Prosperity in any deeper sense awaits the liberation of the engineer. If the owners will not get off his back I, for one, would not be sorry to see him combine with the wayfaring man to lift them off. A complicated technical structure should be run by engineers, not hucksters. But the engineer is the modern Prometheus in chains."

I have been asked to be more explicit. It is good to end a book with a ringing climax, but not quite so good to be forced to explain all its implications. I recognize, however, my duty to state my reasons.

Since James Watt tinkered with Newcomen's engine, the technician has been increasingly interfering with our economic structure. Before Watt, the majority of men and women everywhere were capable of providing their own food, shelter, clothing

and entertainment in whatever locality they found themselves. They were steeped in the traditions of wresting their own necessities from the soil, the waters, the forests about them. They may have done it with deplorable inefficiency, but they did it. Shipwreck a group of them on an uninhabited but fertile island, and they knew how to carry on.

Year by year since 1765, the mass of mankind has been losing the ability to carry on. Shipwreck an assorted crew of bookkeepers, truck drivers, machinists and advertising men on an island, and I would not give them two months' survival. Today the millions live in total and sublime ignorance of the forces which feed, shelter and clothe them. For all they know, switches produce light, and chain stores food. The functioning of the economic process rests in the heads of

a few thousand experts. Is it too much to say that if 100 key technicians left their posts they could seriously cripple a great city like New York? To make matters even more potentially precarious, each expert is so highly specialized that he has little if any conception of the work of the others. There is no General Staff, understanding the whole process, and correlating the vital nerves of transportation, communication, power, water, food supply, which furnish the community's economic substratum.

Specialization makes for economies, as the Progress Boys are tireless in pointing out. I am enough of a Progress Boy myself to admit that we stand to gain more than we lose by the emergence of the technical arts and the economic specialization which they have created. But this should not blind us to the chances taken and the risks involved. Some four million unemployed last winter must be back in the handicraft age when unemployment was virtually unknown.

In brief, you engineers have been raising consider-

able hell, along, with your not altogether heavenly improvements in economic life. And the point I wish to stress is this: you have been doing the horse work while letting somebody else — chiefly the business man — take the responsibility. It seems to me that the responsibility should be squarely yours. You have remade Western civilization, and created at the same time certain malignant evils — actual, like technological unemployment; potential, like a smash-up due to over-specialization. You should shoulder the burden of mitigating these evils. Statesmen, philosophers, generals, poets, may lead self-supporting communities, but only engineers may lead a great, interlocked economic structure.

In a sense the modern world is not led at all. It simply flounders. In the United States, for instance, the real action of the Republic is provided by business men affiliated with large corporate enterprises. The great majority of these business men neither know nor care where the ship of state is headed.

At the heels of the business man follows the engineer. The former says: Let there be light, and the latter provides it . . . Let there be 1000 oil wells (in a pool where wasteless exploitation requires but 100) and they are obediently drilled. . . Let there be the highest building in the world (to choke an already throttled Grand Central station) and it is built . . . Let there be an almost ultra-violet lamp (to sell to the millions who believe in advertising) and, brave in nickel and aluminum, it is properly constructed. . . .

You get the point. The engineer has built the modern world, but only at the bidding of his master's voice. The master knows not a crank shaft from a piston rod, but he knows what will sell. The world is not planned by the business man, for he has no plan. It is not planned by the engineer, for hitherto that has never been his function. He has constructed endless detail — but always as directed. So far as I know, the little town of Radburn in suburban New York, designed specifically

for the motor age, is the biggest single project involving a social-economic goal ever permitted to the engineering mind in this country. It will probably be the most convenient, comfortable, the safest, and perhaps the most slightly suburban town to live in that the nation has ever known. The business man has stepped aside — taking a modest six percent — to let the engineer run the show.

It is my conviction that the engineer can run far bigger shows than the town of Radburn to the satisfaction of (1) the people who are to use them or work in them, (2) the investor, (3) himself, and (4) the technical requirements of the country's future development. Suppose, for instance, that broad-shouldered engineers had had the past century in charge as directors — or co-directors if you will. Would they have permitted:

The depletion of our forests at a rate four times annual growth?

The violation of all laws of geology in the exploitation of petroleum pools?

The criss-cross and dupli-

cation in the transportation system?

The neglect of cheaper waterways for the profitable exploitation of high cost railways?

The exhaustion and erosion of soils and the floods which follow?

The bottle necks and traffic tangles of metropolitan districts?

The building of skyscrapers faster than the means to empty and fill them?

The desecration of every highway in the country with millions of square feet of cigarette, cosmetic, and soap appeals?

That a century of the engineering mind controlling, or helping to control, economic forces, would have made a wasteless world is, of course, highly problematical. Mistakes would have been made; loss and leakage taken their toll. But I am inclined to believe that a good half of the man-power which now runs to waste might

have been salvaged, with the result that poverty would have been quite finally abolished, unemployment enormously diminished, the accident rate drastically reduced, and a cleaner, safer, more comfortable, more sightly, more integrated nation have been our heritage.

When I speak of the *engineering mind*, I mean a mind that is professional, not commercial; dedicated to building, not to profit-making; that is done with false modesty and has the courage to accept the job of taming the billion wild horses which Watt let loose; that thinks straight and hard; hates waste and confusion, dirt and despair; that never stoops to the adulterated.

Plato once called for philosopher kings. Today the greatest need in all the bewildered world is for philosopher engineers. — *By Stuart Chase, Condensed from the Technology Review (November, '30)*