

ENGINEERING

Engineers Need Biology

To prevent harm to waterways and soil, engineers should know more ecology. Lack of knowledge leads to harm.

► ENGINEERS generally have little or no knowledge of biology, and this gap in their education often causes them to do harmful things unwittingly, declares Dr. Paul B. Sears, professor of botany at Oberlin College and author of *Deserts on the March* and other books on conservation.

In *Science* (July 4) Dr. Sears points out some of the ill effects of engineering works that might be avoided if engineers had more knowledge of living things and the soils and waters in which they live.

Engineers, networking the country with highways, are interested in water only to get rid of it as rapidly as possible. This, declares Dr. Sears, "accelerates movement of water into main drainage channels in flood time and interferes with maintenance of ground-water level by removing water before it can soak in. Also, by speeding the movement of water in earth channels, it leads to roadside erosion and consequent lateral gullies into agricultural land."

Industrial engineers may do an excellent job in building wealth-creating factories, but when they arrange for dis-

charge of wastes into rivers they destroy wealth that is already there. One industrial plant, cited as an example, killed more than 200,000 fish in one summer month by pouring its toxic wastes into the Miami River.

Stream control, which is likely to be a very lively subject after this summer's disastrous floods, needs the broadest ecological approach to be really effective. This has been done in such places as the Tennessee valley. Yet the planners of a \$20,000,000 dam in 1935 rejected the services of ecologists, with the consequence that in a few years they were having to fight flood damage, and found their reservoir to be rapidly filling up with silt.

Present engineering-school curricula have no place for basic courses in ecology, which is the sociology of plant and animal life, and the sciences that deal with soils and natural waters. It is hard to see how such studies could be squeezed into the tightly packed schedules in today's highly standardized engineering courses. Yet without this knowledge, engineers will continue to do unintentional evil along with their good works.

Science News Letter, July 19, 1947



DR. CALDWELL—The death of Dr. Otis W. Caldwell means a loss to science and education.

Though we then lived in a county seat town, the nearest public library was thirty miles away. Even the best public library didn't possess much of the best reading material. Not much then existed, as compared with what may be had today.

The scope and nature of American education has changed. Everybody may now have an education provided he has a little of the necessary gray matter. We even waste a lot of educational time trying to educate a minority who do not possess the "makings," because a little education has become the shibboleth of social respectability. Anyway, our American education has produced millions of high school, college and university graduates, nearly all of whom can benefit through use of modern reading material. Educated men and women in all walks of life constitute a new reading public. It is new in size and new in the scope of its interests.

No aspect of human learning is more important than science. Its astonishing new knowledge appeals to almost everyone. The benefits to humans are hard to measure but are very great. And probably most important of all, the ways of working of scientists seem likely to affect thinking and action of people in general.

People understand much of our science these days. Atomic energy means something to most readers even though parts of it are yet unknown to those who know most. If those who write and who

EDUCATION

Progress—Read to Learn

The death of Dr. Otis W. Caldwell on June 5 has ended a notable career in science and education. Dr. Caldwell was a leading biologist and for ten years head of the Lincoln Experimental School of Columbia University Teachers College. He was a powerful force in the new mode of education in this country.

At the time of the annual meeting of Science Service, Dr. Caldwell, who was a trustee of Science Service, nominated by the American Association for the Advancement of Science, prepared for delivery over the CBS network an evaluation of the public's uses of printed pages about science. Because of illness Dr. Caldwell was not able to deliver this on the radio and SCIENCE NEWS LETTER now publishes it as a final message from Dr. Caldwell.

► DURING my three-quarters of a century a lot of things have happened to the reading public. In our childhood we were constantly urged to *learn to read*. Ever since those childhood days we have been *reading to learn*. Indeed no child has made much progress until his emphasis on learning to read has shifted to reading to learn. Each one of us should always be improving his reading habits, and many adults constantly do so. Reading with enjoyment, understanding, and growth in culture has become a major interest of millions of people.

I well remember when my reading was restricted to "The Youth's Companion," "The Herald and Presbyter," the Sunday school leaflet, a weekly newspaper and an occasionally borrowed volume of Dickens or other novelist.