

PUZZLEMENT AND SCIENCE

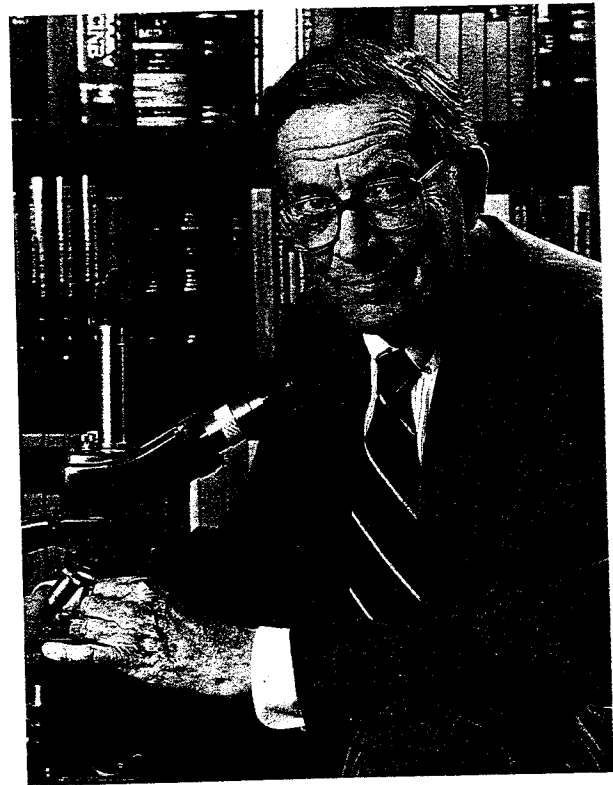
Lewis Thomas, M. D.

Editor's note: We asked Lew Thomas to send us some thoughts. Most classmates are aware of his distinguished career and the wide range of his talents—a doctor, a scientist, a writer, a philosopher, a poet (one of his poems will be found on our poetry page in this issue). His essays in The New England Journal of Medicine, under “Notes of a Biology Watcher”, have been published in three small volumes, the first, “The Lives of a Cell”, winning the National Book Award in 1974. They are gems—observations and insights about life, the mysteries in all living things—best sellers all. After appointments at many medical schools and colleges, he was named President, later Chancellor, and now President Emeritus of Memorial Sloan Kettering Cancer Center in New York City. Princeton's new Molecular Biology Laboratory is named for him, a testimony to his stature in this field. Currently, Lew is Scholar-in-Residence, Cornell University Medical College in New York City.

I claim that puzzlement is an identifying characteristic of the human species, genetically governed, universal, and a central determinant of human behavior. I can go this far with sociobiology, but then, influenced by the same human trait, my mind falls away in confusion. Uncertainty, the sure sense that the ground is shifting at every step, is one of the marks of humanity. We keep changing our minds together, in a biological process rather similar, in its outlines, to evolution itself.

The great body of science, built like a vast hill over the past 300 years, is a mobile unsteady structure, made up of solid-enough single bits of information but with all the bits moving about, fitting together in different ways, adding new bits to themselves with flourishes of adornment as though always consulting a mirror, giving the whole arrangement something like the unpredictability of living tissue.. Human knowledge doesn't stay put, it evolves by what we call trial and error, or as is more usually the sequence, error and trial.

Other animals differ from us in this respect. Each of them has at least one thing to be very good at, even superlatively skilled, surefooted. Any beetle can live a flawless, impeccable life,



infallible in the business of procreating beetles. Not us: we are not necessarily good at anything in particular except language and using this we tend to get things wrong. It is built into our genes to veer off from the point; somehow or other we have been selected in evolution for our gift of ambiguity.

This is how we fell into the way of science. The endeavor is not, as is sometimes thought, a way of building a solid indestructible body of immutable truth, fact laid precisely upon fact in the manner of twigs in an anthill. Science is not like this at all; it keeps changing, revising, discovering that it was wrong and then heaving itself explosively apart to redesign everything. It is a living thing, a celebration of human fallibility. At its very best, it is rather like an embryo.

Ordinarily, scientists do not talk like this about their trade, because there is always in the air the feeling that this time we have it right, this time we are about to come into possession of a finished science, knowing almost everything about everything. Biology has been moving so fast, in just the last few years, that there is some risk of making it seem nearly complete, at the very stage in its development when it is, in real life, just getting ready to take off. It is nothing like finished, it is only just at its beginning. It may be that this century will be looked at, years from now, as the time when it was really discovered how little we knew, and this may be regarded as the most useful contribution of biological science.

I take it as an article of faith that we humans are a profoundly immature species, only now beginning the process of learning how to learn. Our most spectacular biological attribute, which identifies us as our particular sort of animal, is language, and the deep nature of this gift is a mystery. We are aware of our consciousness, but we cannot even make good guesses as to how this awareness arises in our brains, or even, for that matter, that it does arise there for sure. We do not understand how a solitary cell, fused from two, can differentiate into an embryo and then into the systems of tissues and organs that become us, nor do we know how a tadpole accomplishes his emergence, nor even a flea. We can make up instant myths, transiently satisfying but always subject to abandonment, about the origin of life on the planet. We do not understand why we make music, or dance, or paint, or write poems. We are bewildered, especially in this century, by the pervasive latency of love.

The culmination of a liberal arts education ought to include, among other matters, the news that we do not understand a flea, much less the making of a thought. We can get there some day if we keep at it, but we are nowhere near and there are mountains and centuries of work still to be done.