

**Bring back natural philosophy**

Your January editorial decries the apparent lack of esteem afforded science and asks how the relationship between science and the human condition should be demonstrated. It is necessary to look at science from a layman's point of view to appreciate his feelings. To him science is responsible for the technology that makes him, frequently unwillingly, a part of the machine age; science places him among the animals but asks him to reject superstition, dogma and miracles; science takes away his visions of heaven and hell but forces him to live with the fear of sudden death; science tells him to have an open mind and seek a cause for observed effects but provides no answer in his search for a prime cause.

Is this really what science is about? Surely during life we are all, scientist or nonscientist, searching for an understanding of our position in the universe. Science's contribution is that it helps to clear our minds of woolly thinking and tells us something of the evolution and relations of matter and energy forms.

But we are mortal, thinking animals who need to feel that there is more purpose to life than that provided by science's "just chance." A science-conditioned student looks at religion, sees that it is founded on belief, not facts, rejects it and fails to find anything to fill its place. Unless he searches further and finds a philosophy that is, for him, scientifically acceptable, he grows up to hate science for emptying his existence of purpose.

The answer, as I see it, is to integrate science, at school levels, with philosophy (natural philosophy again!). We should unify our curriculum with a common theme—man's position in the social and physical universe. We should present high-school science as just another way to seek understanding, a way that has equal standing with the arts. We can still have a difficult mathematics-physics option for those who have the aptitudes, but let us include much experimental-descriptive science as an illustration of how and what man has found out about the nature of things. Finally, as

a partial goal, we might define an educated person as one who appreciates the importance of the individual since, for all individuals, the meaning of life lies within himself.

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**Aesthetics of physics**

Your January editorial entitled "Little Old Ladies Don't Understand" aroused some thoughts about the character of physicists. We are told that the little old lady "never did understand." Perhaps she did not understand because she was interested in the importance of human relations, feelings, expression of beauty while he told her of his contracts, government funds and grants.

The physicist omitted to convey his main interest in life: to understand nature and its complexity, to admire its beauty and to make it more beautiful for men to grow wiser. In fact, her notion of "culture" was not really different from his.

A physicist does not become a physicist because he is good in mathematics and certainly not because there are plenty of jobs around. In our world there are plenty of jobs for the baker or the mathematician alike if the first makes good bread and the latter explores, with love, infinity—large or small. A physicist becomes a physicist because he loves; besides, we are not concerned with "the little tight circle" representing one's university. Instead, we are concerned with widening the circle so far beyond one institution that we may repay our country for the help and trust it has granted us and extend our understanding in a circle so large it expands much beyond our universities and territories of the United States.

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**In nonphysical situations**

In your February editorial, "Can Anybody Hear Us," Ellis leaves one with the impression that the methods and techniques of physics are applicable to other areas of human endeavor because of their success in physics. In

this connection several points have to be made.

The logical context within which physics has been built and is being developed does not come from the substance of physics itself but is extraphysical. In part physics demands such things as reproducibility of measurements and "elegance" of its theories, and it prefers theories that explain more phenomena to those that explain fewer phenomena. However, one can also construct systems that do not have these constraints and explain observations within them. As a matter of fact, most individuals, even physicists, do not live within a single logical framework but have many logical systems depending on the context.

Further, the physical sciences are inductive, and any inductive process is manmade. Physical scientists first observe, then measure, strictly only two quantities—length and time. From these, other quantities and entities are inferred. Consequently physics is highly subjective and is not as objective as many physicists like to think and as the layman thinks of physics. There is no a priori reason to believe that physicists will have greater insight into other human endeavors than nonphysicists, nor is there reason to believe that their techniques are applicable to non-physics situations.

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**Teachers are not like that**

Your editorial in the January issue of PHYSICS TODAY has pushed my "on" button. I am sure that it was intended to do just that, and I am all in favor of provocative editorials. However, this one is just the latest in a series of yours which seem to me to reveal a considerable lack of knowledge of the dynamics and tensions within the academic community in general and the physics community in particular. It is the sort of simplistic point of view that one is accustomed to find in magazines aimed at general readership being often held by writers in these journals. I am reminded of several articles that have appeared