

To the Editor

The recent letter criticizing as irrelevant to human needs the research leading to synthesis of element 106 continues to evoke a heavy response, the overwhelming majority of it defending in philosophical and practical terms the long-term value to society of pure research. Leading off the following selection of letters is one from the group of scientists who discovered element 106.—Ed.

Philosophy of basic research

We refer to a recent letter questioning the social utility of our discovery of the new short-lived element 106 (SN: 10/12/74, p. 227). This of course is a deep question: Should the public support exotic research that is unlikely to provide practical applications in the near future? One aspect of this question concerns the need of the human race for tested knowledge. Certainly the historical precedent indicates that an accumulated body of knowledge is good, and sometimes necessary, for the preservation of a human society. When some prehistoric woman invented the wheel, when Columbus sailed for the West, when the United States sent a man to the moon, no one knew how the resulting knowledge would be used in years to come by human colonies struggling to create a better life.

We wonder if a research effort that is limited to the needs of our immediate

crises can give us the breadth of knowledge that the human species will need for survival in the distant future. We scientists fully appreciate how slow and painful a step-by-step process is the accumulation of scientific knowledge. We would hope that the people of a modern nation like ours would not object to investing on the order of 10^{-8} of the national budget in its entire fundamental research effort.

*The Heavy Element Group
Lawrence Berkeley Laboratory
University of California
Berkeley, Calif.*

In reply to the criticism of the synthesis of new elements as a childish, wasteful and preposterous practice that squanders funds, I have only to say that we may as well condemn the voyages of Columbus as a waste, say that Galileo and Copernicus were imbeciles pursuing childish fancies, and that the absurdity of the Curies' investigation of radioactivity is all too apparent; at least if we think in that frame of mind. In short, what the author of the letter is insinuating is that unless we experiment with the direct thought of making gains from it or obtaining an applicable substance or concept it is a childish and idiotic action. Yet that is the attitude that scowled at the automobile, laughed at the aeroplane and asserted the lunacy of those who aspired to land a man on the moon. It is not in the least scientific.

*J. P. Marmaro
Sarasota, Fla.*

Byrne shows two very serious errors in thinking. In the first place, what is practical, like what is beautiful, resides in the eye of the beholder. It is certain that the investigators learned a great deal about nature (adding to man's knowledge) on the way to constructing element 106. This, to me, is practicality at its height; though it may not be to anyone else. Further, the availability of element 106 may, in the future, serve some very useful purpose that none of us can foresee.

Secondly, the decision to solve "world food problems, health problems, social problems, etc." are not decisions which should fall to the scientist, except where he is functioning as a member of society. These are not scientific problems to be solved, but are social problems which all of us must soon face along with others (pollution, conservation, etc.) or we may later face extinction, perhaps sooner than we think.

*Richard W. Lasher
Lake Park, Fla.*

If the scientists' intelligence is God given, then undoubtedly that which is found is also created by God. It is for us to unscramble the puzzle and find use for those things provided by the creator.

Before we can use something we must first discover it. Many times the process of discovery is in itself useful to mankind. Also, nothing ventured, nothing gained.

*Dr. Howell Sherman
Lauderhill, Fla.*

Daniel Byrne's letter was very enlightening. Had he read the article with some intelligent foresight, I am sure he could have answered some of his own questions. Consider:

Theory predicts that as progressively heavier elements are discovered a "plateau of stability" will be reached. These elements will have extremely long half-lives and be essentially permanent.

Who can say what benefits these heavy elements will have in metallurgy, or a myriad of other fields?

I, for one, am grateful that scientists (!) are not as nearsighted as Mr. Byrne, and that they spend their time and (my) money in the pursuit of God-given curiosity as well as practical, immediate application.

*Dennis O'Toole
St. Andrew's College
Laurinburg, N.C.*

A heap of kudos for Daniel Byrne whose letter hits all too many of our present breed of scientists where it should do the most good—in their over-inflated craniums. Instead of deifying their own intellects, even when making a real not phony contribution to the sum of knowledge of God's creation, let them thank the Creator for a knowledge of the wonders He has performed. A ten-minute daily readings of the Psalms may help to shrink their hat size. To start with Psalms 18-97 and 148 will help.

*Horace Frommelt
Consulting Engineer
Fort Pierce, Fla.*



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