tional Science Foundation of its policies in implementing Section 3.(c) of the National Science Foundation Act, which stipulates:

". . . it shall be one of the objectives of the Foundation to strengthen research and education in the sciences, including independent research by individuals."

So far as I have been able to determine, this provision of the Act has been ignored or flouted almost without exception for the entire 30-year history of the Foundation. If Einstein or the Wright Brothers were to apply for an NSF grant, they would be risking disclosure of their ideas to others and they might invest substantial time and trouble with almost no prospect of a good-faith review of their proposals.

Either the Act should be modified to eliminate provision of support for individuals, or the Act should be implemented in good faith.

LAWRENCE CRANBERG
1/22/80 *Austin, Texas*

•

Lawrence Cranberg states that: "His skill as an instrument maker . . . brought Spinoza a living that was ample for his modest needs. Equally important, it brought him the friendship and patronage of the leading intellectuals and scientists of his day, including Huygens and Leibnitz, whose scientific correspondence with Spinoza is still extant . . . "

Scholars of Dutch history do not paint such an idyllic picture of the life of Spinoza, the underemployed intellectual. For example, according to Leo Balet[1]: "When we hear that the philosopher Arnold Geulinex, as a professor at the University of Leyden, enjoyed a salary of 300 guilders a year, and that everybody in those days held the man for *gruwelijk arm* (terribly poor), we can imagine the poverty of the lens-grinder Spinoza with his yearly earning of one hundred guilders." It was malnutrition, and unheated room, and the fine dust he ground that exacerbated Spinoza's tuberculosis and led to his early death.

Balet goes on to state that: "Huygens could not abide him [and] did not even call him by his name [but] used to speak of Spinoza as the "Jew of Voorburg" or the "Israelite." Huygens found that Spinoza was a lens-grinder, but a poor philosopher . . . Leibnitz did not like Spinoza either . . . Leibnitz, who owed much to him, concealed his debt, and carefully abstained from saying a word in his praise . . . The last important influence on Leibnitz's philosophy was that of Spinoza, whom he visited in 1676. Leibnitz spent a month in frequent discussions with Spinoza, and secured part of the *Ethics* in manuscript. In later years he joined in decrying Spinoza, and minimized his contacts with him, saying he had met him once, and "Spinoza had told some good anecdotes about politics . . ."

The tragic life of Spinoza may provide a "moral for our days," but not the one that Cranberg cites. Rather, the moral is that underemployment makes intellectuals vulnerable to exploitation, attack and annihiliation.

Reference

1. L. Balet, *Rembrandt and Spinoza*, Philosophical Library, New York, 1962 pages 103 and 107. This book also contains an excellent and extensive bibliography on Spinoza.

GERALD ROSEN
Drexel University
12/26/79 *Philadelphia, Pennsylvania*

THE AUTHOR COMMENTS: Neither of Spinoza's contemporary biographers[1] confirm the "tragic" interpretation of Spinoza's life advocated by Gerald Rosen, nor does his own source, read in context. Spinoza's refusals of a Heidelberg professorship and of designation as sole heir of an affluent admirer speak to his employment opportunities and to his economic options. A man who outlived his mother by 39 years and his father by 23 years has not obviously been cheated on life span.

Rosen's "tragic" view derives from secondary sources that may reflect sectarian hostility lingering from Spinoza's excommunication and are not supported by evidence.

Spinoza's life was not idyllic but an inspiring example of strength in adversity. He survived condemnation in his youth without bitterness or self-pity and went on to create a legacy of enduring intellectual achievement, adorned by universal testimony of his gracious personality and impeccable character.

He amply earned the role of hero and life-style model not only for Einstein but for generations of intellectuals.[2] His position remains unassailable today, and stands as a monument to the opportunities and rewards of free thought and personal resourcefullness in an open society.

References

1. *The Oldest Biography of Spinoza*, A. Wolf, ed., Dial, New York, 1927.
2. For an admirable recent interpretation of Spinoza, see *Spinoza and the Rise of Liberalism*, by Lewis S. Feuer, Beacon, Boston, 1958.

LAWRENCE CRANBERG
1/10/80 *Austin, Texas*

Laser for Fusion

I read with great interest your news story "Shiva Moves Closer To Laser Fusion" in November (pages 20–22). I should like to

Continued on page 114

letters

continued from page 15

suggest, however, that your conclusion that gas lasers appear to be more promising than solid-state lasers for achieving the higher repetition rates required for fusion reactors may be somewhat dated.

In early October, 1979, John Emmett of Lawrence Livermore Laboratory gave an invited talk on this subject at the Optical Society of America Meeting in Rochester, New York. In this talk he expressed the opinion that the most promising laser for a fusion reactor is a solid-state laser with a lasing wavelength of approximately one micron. He was referring to vanadium-doped magnesium fluoride, but it was interesting to note that he ruled out Nd:glass lasers because they were a factor of two to three too low in efficiency. Some of us remember that seven years ago the Nd:glass laser was ruled out because it was orders of magnitude too low in efficiency.

We are encouraged by the progress made in improving the peak power and efficiency of Nd:glass lasers. This progress is all the more remarkable when we recall that the overwhelming attitude during those seven years was that this Brand X laser would surely be a gas laser. I for one believe that if our efforts were directed as much toward improving Nd:glass lasers as they were towards inventing exotic new lasers, we would soon have a 5%-efficient 5-pulse-per-second Nd:glass laser. Long-pulse Nd:glass lasers have operated at more than 20 pulses per second.

Several improved technologies (such as adaptive mirrors to correct thermal distortions and improved axial gradient cooling fluids) and worthwhile research efforts (such as sensitization of laser materials and regenerative laser systems) are now available for further improving the state of the art of Nd:glass lasers. I urge their pursuance as the surest route to an acceptable laser driver for prototype fusion reactors.

Nd:glass may not, in the long run, prove to be the ultimate laser, but I believe it is the surest and fastest route to an acceptable laser. Reaching the milestone of an acceptable laser would allow our energy planners to concentrate on the formidable engineering and design problems relating to reactors and reactor/laser interfaces.

GEORGE DUBE
Owens Illinois
Toledo, Ohio
12/10/79

Action on energy

We write this letter in the hope of stimulating some response from our colleagues in the physics community on a suggestion having to do with the role of the scientific community in the present energy "crisis." We sit here in a rather despondent state, having recently returned from a large and prestigious conference on energy alternatives and, while we listened to many fine papers detailing personal, organizational, institutional and governmental research efforts in a wide variety of areas, we could sense no coherent "message," no clear and ringing words of advice to the public or the government, that one could truly say came from "the scientific community."

There was a time in the past when a single letter from Albert Einstein to President Franklin Delano Roosevelt initiated the Manhattan Project. Is there a single scientist today, who, by a letter to President Jimmy Carter, could initiate an analogous effort to ameliorate the energy crisis? Since we realized this crisis only constitutes the moral equivalent of war, we would settle for the moral equivalent of a Manhattan Project. To answer the question, however: we doubt it! A letter from Jane Fonda to our President would probably produce more of an effect than one from any Nobel laureate.

We do not mean to imply that a Manhattan-type project is needed or desirable, but we feel very strongly that some cohesive position by the scientific community must be taken, so that the necessary action in the social, economic and political spheres can be initiated. Why has such action not been taken by us? Is it that the scientific community has fallen from grace? Is it that there are no scientists with the stature of an Einstein? Is it that we have no position to take and no solutions to offer? Each of these questions is pertinent and we would like to address each of them briefly and, in so doing, set forth our own suggestion.

To begin with, it is not that we have no solutions: much worse than that, we have too many solutions. We don't believe the lay public or the Congress knows what to think at this point, much less how to act. It is precisely for this reason, that the rather nebulous "scientific community" must respond. Scientifically speaking, there seem to be two problems that fall within our collective areas of expertise and to which we could, in principle, address ourselves as a community. These are: (1) to identify the area(s) of energy production that need to be developed on a long term basis, and (2) to identify the presently available technologies of energy production that should be used to get us to that point.

Personally, we don't believe there is an Einstein of energy in our midst today, although we are willing to stand corrected. By that, we mean that we perceive no single scientist who combines both the expertise in the area and the personal stature necessary to, single-handedly, influence the course of national energy policy. What we suggest, therefore, is that the various national scientific organizations, the APS among them, each select a small delegation of experts. These separate delegations would then meet together in conference and address the scientific aspects of the problems previously mentioned, or, indeed, whatever other alternative problems they would define. Such a body of experts, selected in an unbiased manner by their peers and representing all of the scientific disciplines would, in our opinion, constitute the proper moral equivalent of war.

Clearly, the energy problem has its social and political ramifications which are probably at least as important and refractory as its scientific aspects. Yet, at least in the scientific arena, we have the mechanism, through joint action by our learned societies and associations, to advance proposals that are sorely needed and have been too long in coming.

MORTON TAVEL
Vassar College
Poughkeepsie, New York
JUDITH TAVEL
Dutchess Community College
Poughkeepsie, New York
1/10/80

Aesthetic misunderstanding?

It is just possible that some readers of Richard Kadel's letter in November (page 74) on Chandrasekar's article might take his (Kadel's) sentence "What are we to surmise when we are told that certain mathematical equations thrill G. N. Watson as much as the Medici tombs—was the man a necrophile?" literally, and this might be read as an unfortunate slur on Watson. Kadel is surely aware that when one refers to "the Medici tombs" one is thinking not so much of the tombs of Lorenzo and Giuliano de' Medici in the Sagrestia Nuova of San Lorenzo in Florence, but rather of Michelangelo's four figures Day and Night, Dawn and Evening.

K. ALEXANDER BROWNLEE
Ouray, Colorado
11/26/79

Chaucer's theory of sound

The quotation given in the box is from Chaucer's *House of Fame*, a great burlesque of Dante (and almost everything else). This particular part is commonly regarded as a piece of "clown philosophy," that is, a parody of the style of argumentation and explanation which was common in the late fourteenth century.

However, we know that Chaucer was very good at presenting serious thoughts in a light-hearted manner, and since we also know that he was very well-versed in the science of his day, it would seem reasonable to wonder if he would use the method of parody as a vehicle for serious scientific speculation.

Notice, in line seven, Chaucer's appeal to experiment (*experience*) in order to establish the *wave* nature of sound by analogy with water waves. Throughout