Letters

Support for Italian Science

The following letter, signed by 82 Italian scientists in medicine and biology, has recently been sent to President Lyndon B. Johnson.

Dear Mr. President:

We, the undersigned, a group of Italian biologists who have received substantial financial help from American granting agencies for our research, wish to express our deep gratitude to you and to the American scientific community. Before World War II, private foundations, primarily the Rockefeller Foundation, were instrumental in the development of biological studies in our country by the assignment of fellowships and of funds for scientific equipment. After the War, although their interest has continued, an even greater support was offered to our laboratories, as well as to those of other colleagues, by Federal agencies, primarily by the National Institutes of Health. Such support has undoubtedly been a determining factor in the training of scientists and in the establishment of active research groups in Italian universities and research laboratories. We deem it our duty and pleasure to acknowledge that without the support received from the American scientific community the level of scientific productivity in the field of biology and medicine in Italy would now be much lower. For this we wish to thank you.

The community of Italian research workers in biology and medicine has now been informed by representatives of some Federal granting agencies and of private foundations that their engagements in other areas justify a reduction in their support to Italian laboratories. They add that the economic conditions of our country have substantially improved during recent years. While we well understand these reasons, we fear that such curtailment in support may jeopardize the survival of a number of active research centers. For this reason we have addressed ourselves to the Italian Government to obtain funds from national sources to replace the diminishing support from the United States. We trust that our requests will be favorably considered.

Whatever the outcome of these requests, we hope that the policy of supporting our efforts will not be discontinued by the United States, even though a reduction may be necessary. A very significant benefit has accrued as a result of your support, and that is the close cooperation between scientists of our two countries, a cooperation which we consider very useful to both. We would point out also that public investment for research and development in Italy is still much lower in relation to gross national product than it is in other European countries. We hope accordingly that close contact may be established between representatives of Federal granting agencies and representatives of corresponding bodies in our country, to study what measures, better suited to the economics and policies of both nations, might be taken to ensure continuing cooperation between American and Italian laboratories in the field of biology and medicine.

We place ourselves, Mr. President, at your disposal for providing more information on this subject and for furthering friendly contacts with representatives of the United States Government.

ALFREDO LEONARDI
Istituto di Ricerche Farmacologiche "Mario Negri,"
Via Eritrea, 62, Milan, Italy

Pleistocene Time Scales

I would like to comment on the article in *Science* by Erickson, Ewing, and Wollin entitled "The Pleistocene epoch in deep-sea sediments" (*1*).

By now many researchers must be completely confused by the plethora of Pleistocene chronologies which have been published during the last 10 years. At one extreme, Erickson and his co-workers estimate the base of the Günz glaciation at 1.5 million years; at the other, Emiliani (*2*), corroborated by Rosholt *et al.* (*3*), estimate it at 300,000 years. The wide divergence between these two chronologies is of particular interest, because they are based upon the same radiometric dates for deep-sea cores which were studied by both groups of workers. When this is established, the reader must ask: How could these competent researchers, on the basis of the same data, arrive at chronologies differing by a factor of 5?

Part of the discrepancy can be accounted for by analyzing the data from these laboratories for a single core—for example, core A179-4. It appears that there is a disagreement concerning the magnitude, significance, and correlation of the temperature fluctuations indicated by foraminifera from this core. The temperature minimum between 260- and 320-cm depth in the core is correlated by Emiliani with the Riss glacial, whereas Erickson *et al.* correlate it with the first episode of the Würm glaciation. This is illustrated in Table 1. The lack of agreement on correlation can account for divergence by a factor of 2 in the time scales.

But a factor of 5 is involved. The factor of 5 is a result of different methods of extrapolating ages to basal Günz. Emiliani's extrapolation is based upon a correlation with the Milankovitch solar insolation curve. If Emiliani were to accept the climatic correlations of Erickson *et al.*, he would obtain a time scale very similar to that of Zeuner (*4*), that is, basal Günz would be dated at circa 600,000 years. A discrepancy with a factor of 2.5 would still remain.

The extrapolation of Erickson *et al.* is based upon a relation between sediment texture and rate of sedimentation as established for that part of the core records which includes sedimentation during the last 100,000 years. Thus this extrapolation includes over 90 percent of their Pleistocene time scale. Clearly they have a greater faith in the doctrine of uniformitarianism than I have. It would seem preferable to declare a moratorium on

Table 1. Comparison of chronologies for core A179-4.

Depth in core (cm)	Age based on radiometric data (10^3 years)	Correlation according to	
		Erickson *et al.*	Emiliani *et al.*
0- 30	0- 10	Holocene	Holocene
30-170	10- 65	Würm 2-Würm 3 Interstadial	Würm (1, 2, 3) Interglacial
170-260	65-100	Würm 1	Riss
260-320	100-130	Interglacial	Interglacial
320-450+	130-175+		

the construction of Pleistocene time scales until firmer data are available upon to which to base such a chronology.

PAUL E. DAMON
Geochronology Laboratories, University of Arizona, Tucson

References

1. D. B. Ericson, M. Ewing, G. Wollin, *Science* **146**, 723 (1964).
2. C. Emiliani, *J. Geol.* **63**, 538, (1955).
3. J. N. Rosholt, C. Emiliani, J. Geiss, F. F. Koczy, P. J. Wangersky, *ibid.* **69**, 162 (1961).
4. F. E. Zeuner, *Dating the Past* (Methuen, London, ed. 3, 1952), p. 140.

Observatories in the Southern Hemisphere

I should like to correct or clarify some statements made by V. K. McElheny in his article on "Large new telescopes for the Southern Hemisphere" (6 Nov. 1964, p. 755).

The Lick Observatory has not had a station in Chile since 1929. Previously it operated a 0.94-meter (37-inch) reflector on Cerro San Cristóbal, Santiago. This was sold more than 30 years ago to a private individual, who donated it to the Catholic University in Santiago, which has since maintained and operated it.

La Silla, the site selected for the European Southern Observatory, was not among those tested during the site-survey expedition that I conducted for AURA (Association of Universities for Research in Astronomy). However, because of its nearness to Cerro Tololo, the site chosen by AURA, and because it has a similar elevation, La Silla is expected to be a good site.

McElheny says that "the project of the European Southern Observatory (ESO) organization is most advanced." ESO only recently purchased a large tract of land around its future observatory site, and has also only recently acquired a tract of land in Santiago for a future headquarters; no construction has started yet on La Silla nor on an access road to the summit. The first ESO telescope for Chile, a 1-meter reflector, has been completed in Holland and is scheduled to be delivered in Chile later in 1965. The AURA construction program, on the other hand, was started more than 20 months ago, after a 3-year program of site surveys. The headquarters in La Serena, including an administration building and three residences, are completed. An access road to Cerro Tololo, 38 kilometers long, was completed more than a year ago. All sites for the entire building program on the mountain have been leveled and prepared for construction. The first two permanent buildings on the summit are under construction now. The water-supply system, which will bring water to the peak from a spring 1000 meters below, is nearly installed, and so is much of the system for the distribution of electrical power. A large generator has been operating on the mountain for a year. Of the four telescopes in the present plans of AURA, one has been operating on Cerro Tololo for 3½ years. An identical telescope, a 40-centimeter reflector, will be delivered to Chile soon. Two other reflectors (1.5 and 0.9 meters) are under construction and will be delivered near the end of 1965. The optical components for these three telescopes are being made at the optical shop of the Kitt Peak National Observatory in Tucson, and will be finished well before the telescopes. The U.S. Air Force is providing funds for the 1.5-meter telescope, the National Science Foundation for the others and for all construction and operations.

The main reason for using fused quartz for large mirrors, instead of pyrex, is not its greater rigidity, as McElheny suggests, but its lower coefficient of thermal expansion, because of which the effect of atmospheric temperature changes on telescopic images will be negligible.

JURGEN STOCK
Cerro Tololo Inter-American Observatory, Casilla 63-D, La Serena, Chile

(An article on Cerro Tololo by Stock appears on p. 1054 of this issue.)

Stock's remarks are a welcome clarification of an article written from a European vantage point. The statement about the Lick Observatory derived from misunderstanding of a public source. The fact that the European organization relied strongly on Stock's investigations of a nearby site led to inexact wording which made it seem as if he had actually surveyed the site chosen by the Europeans after they decided against accepting the American offer of part of their large site. In saying that the European project was most advanced, I was speaking only of plans to build a telescope of nearly the resolution of Palomar. Although AURA hopes for a 3.5-meter telescope at the Chilean site, presumably of design