Fitzroya. The burned area was destroyed by fire which probably originated beyond the Andes where forests are usually burned for so-called agriculture reasons. I shall avoid describing an extensive area in flames which we crossed. Perhaps 100,000 trees were burning.

"Good" samples, one millennium old, were rescued from the lumber mill and consequently the prohibited region was not visited although very probably "good" *Araucaria* trees exist there.

Let us act now to conserve these and other Andean forests. Conservation will provide both a refuge for the animal life which is threatened by commercial safaris, and will preserve the sources of a vast hydrological system. Biologists and environmental scientists will be grateful and forthcoming generations will enjoy a natural beauty.

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Symbolic Eskimo Mask

In response to Engel's letter (16 Feb.), the mask on the 29 December cover of *Science* manifestly depicts a classic lower motor neuron facial palsy. But we would be doing a disservice to the disciplines of anthropology, sociology, and psychoanalysis as well as the cultures that produced these artifacts if we were to dismiss the mask with having no latent meaning. In any society, no matter the level of its technology, decoration may be of two general forms: (i) accidental to the process, as in the fluting of the edges of a stone blade; or (ii) purposive to enhance the value of the object, as in the stylized carving on Haida oil bowls.

The enhancement of value brings the object into the area of emotional significance rather than mere utilitarian use. The value of the mask may be strictly utilitarian, that is, it might be a protective facial covering against the elements. But then undoubtedly masks made of hide would be more easily fashioned from more readily available materials and most certainly with greater symmetry. . . .

The expenditure of time and energy in carving an object out of a relatively scarce material presumes a purpose on the part of the craftsman not wholly utilitarian but perhaps one with an emotional significance. The mask could be symbolic of an emotional state delineated in a local myth. The mask and legend are interrelated and correspond to the same symbolism within this myth. This particular mask type appears in many diverse cultures in a variety of forms. In shamanistic ceremonies it is used to exorcise the spirit of disease. Variations of the "crooked face" myth have survived the decline of those cultures that had produced the mask artifacts. These myths ascertain the purpose of the masks and elaborate their use in healing. . . .

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. . . The mask represents the "half-man half-animal," a well-known spiritual being that was widely distributed in western Alaska. It belonged to a category of spirits who lived in their own communities, and did not "belong" to other objects or animals as many spirits did.

Several groups of Eskimos from around the Bering Strait personified spirits in amulets and masks, which had been interpreted for the carver by the angutkuk (or medicine man). This particular spirit everywhere had a human and an animal (usually a red fox) side to his face. Some masks had a line or ridge placed in the middle of the face, but the King Islanders (whose mask was illustrated) disdained such devices, although the division between man and animal as seen on the mask was conceptually inflexible.

Man and animal were further differentiated by shape, size, and placement of mouths and eyes. These were purely artistic conventionalizations, not indications of physical disabilities. The upturned half of the mouth in all masks represented the animal, and the downturned mouth, the man. In my book, *Eskimo Masks* (Univ. of Washington Press, Seattle, 1967), from which the illustration was taken, a more complex rendering from Nunivak Island is also illustrated. The distinction between man and animal is terrifyingly clear in this mask. The red fox's mouth is a wide, deep gash that rips the left cheek apart at a 45° angle from the middle of the mouth almost to the edge of the cheek and up to the height of the eye and is inlaid with 12 dog's teeth. The left eye is placed at the same angle to the gash. The right side of the mask is a human face.

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Cambridge: Molecular Biology

I read Walsh's report ("Geneva: Molecular biology research comes of age," 16 Feb., p. 718) with great interest, not least because it gives due prominence to the work of my friend Alfred Tissières. There is, however, a statement in the report which is erroneous on two counts: that Tissières was at the "Cambridge Laboratory of Molecular Biology" from 1947 to 1957. In fact he and I were both working at the Molteno Institute, Cambridge, during that period. Walsh takes no cognizance of the great debt that Tissières (as I am sure he would admit), like myself and many others who worked there, owes to the late David Keilin whose discovery of cytochrome opened a new era in biochemistry.

The second error is more fundamental. In 1947 there was no molecular biology laboratory in Cambridge, nor for that matter elsewhere. The term *molecular biology* was brought into use considerably later, largely at the instigation of a certain group of x-ray crystallographers working at the Cavendish Laboratory. This group had taken on the incredibly difficult task of interpreting, in terms of molecular structure, the x-ray diffraction patterns given by crystals of oxyhemoglobin. In 1947 the future of this work was placed in jeopardy by lack of funds and it was due largely to the insight and influence of David Keilin that the work received adequate support and that Cambridge, in due course, saw the birth of that vigorous extrovert offspring of the physical and biological sciences: molecular biology.

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Population Growth: Crash Program Needed

The Committee on Population of the National Academy of Sciences has given us (Letters, 23 Feb.) another wonderful example of the "safe, sane, slow, and responsible" school of dealing with population and other crucial problems of the day. They inform us that a zero rate of population growth "may be essential in the long run but as a goal within the time horizon of current policy it has little support in either the developing or the developed world, certainly not among governments."

It probably would be useless for us to reiterate here the facts of the population-food-environment crisis which have been so eloquently stated by LaMont Cole, Karl Sax, William Vogt, William and Paul Paddock, James Bonner, and many, many others. Surely, however, there must be some way to make this committee of the National Academy of Sciences aware that the population growth rate *will* reach zero (or, more likely, go negative) in the future regardless of how much support that goal has from people or governments. The question is: how soon and by what means will the growth rate reach zero or go negative? We have just returned from a discouraging day rich in platitudes, fuzzy thinking, technological optimism, and lack of consideration of environmental problems at the "Second International Conference on the War on Hunger." The conference reinforced our belief that the world is committed to the "death rate solution"—one in which population growth ends largely because of a rising death rate. The response of the population committee deepens our feeling of hopelessness. One might have hoped that this committee would feel a duty to get the establishment working on a crash program leading to a "birth rate solution." Instead they produce a pompous commentary on Davis' well-reasoned article. Most of us, gentlemen, do not need reminding about the political realities. Why aren't you, in your position of prominence, doing everything in your power to change them?

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The letters on population control ignore the second opening in the population pool: death. The current medical attempts to keep people alive forever recall the main reason for burgeoning populations: a drastic decrease in death rates without a corresponding drop in birth rates. So, we will plan to limit births. Fine. Should we then simultaneously encourage research to keep people alive still longer? It seems likely that there is some point where it is best, from a collective view, to let old people die to make room for new, hence more adaptable, individuals. Any serious attempt to curb population must consider this uncomfortable question.

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Davis makes a compelling case that present family planning programs alone will not succeed in curbing population growth. He calls for expanded social research and experimentation so that governments may take effective measures to influence couples to have small families—the goal being the public control of the size of the population. The same conclusion was reached at the September meeting in Caracas on Population Policies in Relation to Development in Latin America jointly sponsored by the Organization of American States, the Pan American Health Organization, and the Population Council, Aspen Institute for Humanistic Studies with the cooperation of the government of Venezuela. The meeting was attended by 145 representatives of Western Hemisphere countries.

The recommendation was made that "a population policy should not be adopted in an isolated or unilateral fashion, but should be part of the total phenomenon of development . . . a coherent set of decisions making for a rational strategy, adopted by the public sector in accordance with the needs and desires of the community, to develop, conserve, and use human resources by influencing the probable size and growth of the population, its age make-up, mortality rates, the formation and composition of families . . . in order to facilitate . . . economic growth and enable the people to share in the responsibilities and benefits of progress" (*1*). The OAS was asked to provide technical support to the Committee on Inter-American Progress on population trends and variables. So far, Colombia has the most extensive program of population research. Mendoza-Hoyos of the Association of Colombian Faculties of Medicine said, "Population fertility will not be fully understood unless we know the psycho-physiological factors involved in sexual behavior and contraceptive practices. Nor can variations in fertility be understood unless marriage, family, the formation and dissolution of conjugal unions are taken into account. These . . . are determined to a great extent by cultural patterns" (*2*).

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References

1. *Final Report of Meeting on Population Policies in Relation to Development in Latin America,* REPO/II/17, English rev. (OAS, PAHO), mimeo., p. 6.
2. H. Mendoza-Hoyos, *Proc. Third PASB Conference on Population Dynamics, June 1967* (Pan American Health Organization, Washington, D.C.).