

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 deline-

ated 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 up-turned half of the mouth in all masks represented the animal, and the down-turned 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."