6. This alga was collected at Akkeshi in Hokkaido in June and was carefully selected to avoid contamination with any traces from animal sources.
7. All melting points listed are uncorrected.
8. All optical rotations were measured in chloroform at 25°C.
9. The algae were collected at Shirahama in Shizuoka Prefecture.

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Prenatal Protection of Mice by Yeast Antibiotic (Malucidin)

We prepared a complex protein with antibiotic properties from brewer's and baker's yeasts. This material, when injected into animals in doses of 1 to 10 mg/kg of body weight, protected them against infections caused by a number of organisms, including several species of Gram-positive and Gram-negative bacteria, fungi (including *Candida albicans*), and *Shigella* endotoxin (*1*). In many respects this material is different from other antibiotics; it has a very wide spectrum of activity and a long-lasting effect. Mice injected with larger doses of this new agent were refractory to inoculation with *Proteus* OX19 for at least 1 mo. This observation stimulated our interest in investigating the effect on their offspring of treatment of pregnant mice with Malucidin.

The mice received injections of Malucidin in the later stage of pregnancy and 2 to 3 days later gave birth to litters. Injections of Malucidin were given intravenously or intraperitoneally; since there was no difference in the results after injection of Malucidin by either route, the data were combined (Table 1). Young mice were tested for resistance to *Proteus* infection when they reached the age of 2 to 3 weeks, in which stage they continued to be suckling. Results are summarized in Table 1.

Table 1. Protection of mice by prenatal injection of Malucidin. Numerators indicate the number of survivors; denominators indicate the number of mice used.

Group No. and treatment of mother	No. of Proteus organisms injected into suckling mice			
	250 M	750 M	1.5 B	3 B
Experiment with mice 3 wk old (av. body weight, 7 g)				
1. Control—no treatment	3/4	0/7*	0/2	0/2
2. Injected with 5 mg of Malucidin on 2 consecutive days	2/2	9/12*	2/4	0/6
Experiment with mice 2 wk old (av. body weight, 5 g)				
3. Control—no treatment	0/5	0/6		
4. Injected once with 10 mg of Malucidin	3/4	0/6		
5. Injected twice with 10 mg of Malucidin 24 and 48 hr after birth of offspring	0/5	0/6		

* The difference between these two groups was statistically significant: $P < 0.01$.

As can be seen from the table: (i) pregnant females treated with Malucidin produced progeny more resistant to *Proteus* infection than those of normal, untreated mice; and (ii) as group 5 indicates, the resistance was not transmitted with the milk, since the offspring of mice treated with Malucidin after delivery were not more resistant than normal, untreated mice.

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References

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28 June 1957

Volcanic Activity and Alaskan Spruce Growth in A.D. 1783

In the absence of historical accounts, tree-ring chronologies have provided considerable data for reconstructing climate of the past. This report is an attempt to explore further the association between a specific series of climatic phenomena, volcanic eruptions, and anomalies in Alaskan tree-ring patterns for the year A.D. 1783. The effects of major volcanic activity upon world climate were amply dramatized by the significant drop in world temperatures following the eruption of Tomboro in 1815, of Krakatoa in 1883, and of Katmai in 1913 (*1*). It now seems possible that, under certain conditions, previously unrecorded volcanic eruptions can be detected by their effect on the annual ring records of white spruce [*Picea glauca* (Moench.)] in western Alaska.

When J. L. Giddings began his northern Alaskan tree-ring studies, he noted that the final growth cells for the year A.D. 1783 were obscure, particularly in ring records of spruce growing at tree line and at the biological limit of the species. At the time the ring sealed off for that year, a distinctive layer of thin, faintly visible cells was added, rather than the customary dark late cells; this layer has been designated "faint latewood" (*2*). The 1783 faint latewood is common to many, but not to all, northern Alaskan white spruce which have been sampled and which are of sufficient age to contain it. The unique ring occurs sporadically in tree-line spruce of the Copper and Kuskokwim rivers and is common in the Yukon River spruce (*3*).

On the basis of recent inquiries it appears probable that the unique characteristics of the 1783 ring bear a direct relationship to certain widespread natural phenomena that occurred during the summer of 1783 in Europe, Japan, and the United States. In the eastern United States, at least, this was a year without a summer. Benjamin Franklin (*4*) commented upon the climate for this particular year and noted:

"During several of the summer months of the year 1783, when the effects of the sun's rays to heat the earth in these northern regions should have been the greatest, there existed a constant fog over all Europe, and great part of North America. This fog was of a permanent nature; it was dry, and the rays of the sun seemed to have little effect toward dissipating it, as they easily do a moist fog, arising from water. They were indeed rendered so faint in passing through it that, when collected in the focus of a burning-glass, they would scarce kindle brown paper. Of course, their summer effect in heating the earth was exceedingly diminished.

"Hence the surface was early frozen.

"Hence the first snows remained on it unmelted, and received continual additions.

"Hence perhaps the winter of 1783–4 was more severe than any that happened for many years."

Franklin further stated that smoke from a volcanic eruption in Iceland might have been carried by winds to various parts of the world, which would explain the abnormally cold summer. The Skaptar Jokull eruption in Iceland was the one to which he referred, and it was most active on 8 and 18 June of 1783. Symons (*5*) noted that a "dry fog" appeared over all of Europe on 17 June 1783 and that it was world-wide in its distribution.

In a recent study of summer temperature and Scandinavian tree growth, Schove (*6*) remarks that Finland had a bad harvest during 1783, while central Europe had a great deal of heat and excessive south and southeasterly winds. He states further that the narrowness of the tree-rings in northern Europe for that year may have been due to the dust-haze that followed the volcanic eruptions, and he also comments upon the peculiar nature of this ring in Alaska.

In addition to the major volcanic activity in Iceland, there was also the eruption of Asama in Japan, on 4 Aug. 1783, which has been termed "the most frightful eruption on record" (*5, 7*).

Spruce increment borings were taken recently by the writer in western Alaska during the growing season, and these may serve as a gross index of the period of growth in western Alaskan spruce.