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dealing with men afflicted and affected by this disease.

Accidents on our highways cost the country nine billion dollars annually.

Prior to this year, I was a member of the Senate Public Works Committee which helped to write some of the legislation dealing with highway safety problems. Appalled as everyone is with the astronomical costs in connection with these problems—I supported this safety legislation which was primarily addressed to improving the safety of roads and vehicles. At the same time I was, and remain, concerned about what we sometimes refer to as "the nut behind the wheel," for when a driver has been drinking he threatens the safety not only of himself and those riding with him but also the sober and unsuspecting motorist on the road.

The Public Health Service has estimated that alcohol contributed to—or is associated with—the cause of fifty per cent of fatal motor vehicle accidents.

In California alone, I understand that forty-six thousand people were injured and fifteen hundred killed as the result of driving under the influence of alcohol.

Such unnecessary carnage on our highways must be stopped. I personally urged the State Legislatures to get tough in this area—for it is clear that when a driver is drinking he is both dangerous to himself and to his fellow citizens.

In California, alcoholism is the tenth leading cause of death. For individuals in the most productive ages of 20 through 40, one-third of all deaths result from alcohol.

And this is another point, Mr. Chairman, that I would like to emphasize because I do not believe it is generally known or understood by the American public, and that is that the life expectancy of an alcoholic is usually ten to twelve years below the general average.

As a member of the Senate Subcommittee on Health, I have a deep interest in alcoholism and its ill effects—a subject which I think has been neglected too long in this country. And I was pleased to have co-sponsored with Senator Javits and others, S. 1508, a bill aimed at initiating programs for the care and control of alcoholism. Naturally, as a conferee on the regional medical program to which this alcoholism program was added, I was pleased that several parts of S. 1508 were included in the final measure. The nation thus started to do what we must do—deal with the growing, unbearable, and costly problem. Building on this beginning, I again this year joined Senator Javits in introducing S. 1997—the Alcoholism and Control Act of 1969. This bill I hope will do much to advance the nation's methods of treatment and cure of alcoholism.

It would establish a division of alcoholism and alcohol problems within the National Institutes of Mental Health. It would provide incentive grants for the construction, staffing and operation of treatment and preventive programs. And it would provide grants for public education which are so badly needed. It would authorize purpose grants for training and material development. It would provide scholarship grants to meet critical manpower shortages in the area—specialists who have a complete understanding of the problems and first-rate training in how to cope with them. It would establish regional centers for research in alcoholism.

Thus, I urge this Subcommittee to take early and favorable action on S. 1907. As we all know the stakes are very high in this nation's battle against alcoholism. The total cost to my State of California each year is a staggering one billion dollars, and I think there are better ways in which we could spend this money.

For Los Angeles County—where we are today holding these hearings, a 1964 study showed alcoholism costing \$27 million. It is

now believed that the cost to the county would approach \$50 million.

So, Mr. Chairman, Los Angeles County, the State of California and the nation appreciates the efforts that you and the other members of this Subcommittee are putting forth in attempting to focus the national spotlight on these two pressing subjects—drug addiction and the horrible disease of alcoholism. And I must hope that as a result of your efforts and the efforts of this Committee we may soon be able to show positive advance and the prevention and treatment in both.

ATOMIC TESTS

Mr. MONDALE. Mr. President, questions of grave concern are being raised about the forthcoming Atomic Energy Commission nuclear tests on Amchitka Island, in Alaska. The first test, scheduled for Thursday, will be an underground blast of 1.2 megatons, as large as any underground test ever conducted in this country. Later tests on the island, in the heart of a national wildlife refuge, could range up to 5.5 megatons, which would be on a scale 300 times greater than the atomic bomb dropped on Hiroshima during World War II.

Not even the AEC is willing to say that these tests could not set off devastating earthquakes and tidal waves in the northern Pacific. Environmentalists and scientists are voicing grave doubts on whether, because of these and other dangers, the tests can be conducted without great risk. Additionally, both Canada and Japan have protested the tests.

At a hearing on the matter this morning before the Committee on Foreign Relations, the Senator from Wisconsin (Mr. NELSON) presented an excellent statement on a situation which is clearly of pressing concern to all Americans. I ask unanimous consent that his statement be printed in the RECORD.

There being no objection, the statement was ordered to be printed in the RECORD, as follows:

STATEMENT BY SENATOR GAYLORD NELSON

Mr. Chairman, I appreciate this opportunity to testify as a cosponsor in support of the resolution of my colleagues, Senators Gravel and Fong, for a commission to study the effects of weapons testing on our international relations and foreign policy.

Speaking for myself, but also, I am sure, for many who are concerned about the Amchitka tests, you are to be commended for holding these hearings.

One of the impressive achievements of this Congress is its increasing insistence that our national defense ventures and expenditures be debated in public, within the bounds of legitimate security needs.

And I would hope that this becomes a pattern for all future Congresses and Congressional committees. Time and again, we have seen the dramatic evidence that the missions of National Defense and Foreign Affairs have grave implications for the other concerns of America and the world: for public health and safety, for the quality of our environment, for our national priorities of ending hunger and poverty, and of providing a quality education, to name just a few.

The proposed underground nuclear tests at Amchitka, which are scheduled to start just three days from now, are a classic example. The mission is apparently to test ABM warheads. Circling in the periphery are grave concerns which don't mean a thing to the

bombs at the bottom of that hole, but do to the public.

And if the history of the Amchitka test preparations by the Atomic Energy Commission is any indication, we have far from adequate assurances that these other matters have fully been taken into account.

The situation has a disturbing similarity to others where Federal agencies have very effectively pursued what they felt was a primary mission, while at the same time, destroying priceless natural resources. Protecting wilderness, scenic rivers, or national parks has frequently been too big a price to pay to get the job done.

Unfortunately, it is beginning to appear that the Atomic Energy Commission is following in the same footsteps. One example has been the AEC's failure to accept responsibility for some of the environmental effects of the nuclear power generating plants which it has helped develop around the country.

Now, in its nuclear testing program, the AEC is again proving reluctant to take on the responsibilities for the fullest possible preparation for all contingencies.

Hard-pressed in Nevada because of rising public concern and the need to conduct larger tests, AEC has had to look elsewhere. The irony of Amchitka, the new site AEC found, is expressed eloquently in a document entitled "Welcome to Amchitka" that is presented to the island's visitors.

One section of the brochure says: "The fact that Amchitka is part of a National Wildlife Refuge makes it evident that hunting of wildlife of any kind is definitely prohibited and any firearms landed on Amchitka will be immediately confiscated and held until the owner's time of departure."

Through some incredible twist of logic, the regulations are bent to allow the biggest firearms of all, nuclear bombs. Nothing will ever convince me that a wildlife refuge and a nuclear blast go together.

The Amchitka test is just one more dramatic instance of a distressing trend in this country: If people won't tolerate it, move it out in the hinterland, with the birds and the fish. The international jetport that is being planned six miles from the edge of Everglades National Park is a prime example. The intensifying interest in using the oceans as a depository for the massive wastes of our society is another.

Until we accept the fact that there is no longer any "hinterland" left on earth, in the sense that it is apart from any contact or any value to man, we will continue to create disaster for ourselves.

To us in Washington, Amchitka seems a distant place. But because it is closer to Japan than to San Francisco and closer to the Russian mainland than to Anchorage, Alaska, what happens on the island means as much to millions of others as it does to us. This is confirmed by the fact that Japan and Canada have already issued protests to the U.S. government on the Amchitka tests.

The problems that have come up with the scheduled tests range from the certainty of new damage to the area's fragile ecology to questions as to whether nuclear tests can be conducted there without setting off devastating earthquakes and tidal waves.

Although twice ravaged by man—first by Russian fur hunters in the 19th Century, then by American military encampments during World War II—Amchitka has been making an astonishing return to its unique natural state, with the help of biologists and wildlife experts who have been working since the 1940's to repair the ecological damage and restore the balance of wildlife.

Now, according to a report late last year, at least twenty pairs of bald eagles nest on the island, as well as several pairs of the almost extinct peregrine falcon.

The Aleutian Islands, including Amchitka, are also the home of the sea otter, the Stel-

ler's sea lion, the gray-crowned rosy finch, and the nearly extinct Aleutian Canada goose. During the nesting season, Amchitka also abounds with puffins, comorants, murres, and gullems. Plant life on the island varies from brilliant wildflowers to sea grasses. As *Audubon* magazine described last year, Amchitka and its wildlife are "a national treasure as surely as the Everglades or the Canyonslands."

But with the onset of nuclear test preparations, the web of nature is being smashed again, making a mockery of the name "wildlife refuge." A *Washington Post* reporter visiting the island recently saw an Amchitka tundra "scarred by roads and drilling rigs, chewed and plundered in a hundred places."

Test preparations have included the sinking of eight exploratory holes, plus four "emplacement" holes for bombs, one of them, the reporter notes, abandoned when the drillers encountered a transverse fissure. Then there are "shallower 'satellite' holes for instruments, vast bins scraped in the earth to hold the drilling mud, and miles of instrument cables."

The AEC says there is room for nine more bomb holes on the 42-mile-long, three-mile-wide island.

Some indication of the after-effects that might be expected is revealed by the Department of Defense "Long Shot" nuclear blast on Amchitka in 1965. The heavy influx of people to prepare that shot cut bird nesting grounds, and the result has been a downward trend in the Amchitka bird population ever since.

Although the relatively small 1965 shot, 80 kilotons, apparently did little itself to disturb the environment, the oily drilling mud used to sink the test hole escaped from its lagoons and poisoned salmon in nearby streams.

Although the Defense Department promised to "police up" after the 1965 test, observers since have noted the leftovers of a still-standing frame for a steel building and a collection of remnant metal and wooden waste materials littering the surrounding countryside.

Clearly, the preparations and the aftermath of the nuclear tests are a major environmental concern. Regardless of what transpires further on Amchitka, both Congress and the Department of the Interior should insist on a complete AEC program to restore the island.

Another significant after-effect of the 1965 "Long Shot" test was radiation seepage from the test hole. And in the last several years, small amounts of radioactivity have been found in the water near the old site.

Department of Defense plans for the 1965 Amchitka test shot were at first so secret that, according to a later report by former Presidential press secretary Pierre Salinger, even the President was not let in on the decisions.

To mollify conservationists, Defense Department officials gave assurances that there would be no more tests on the island after the "Long Shot." Those concerned about the Amchitka tests thought they had a promise, but since then, the AEC has made it clear it feels the Defense assurance was not binding whatsoever on other federal agencies. There is little wonder that the credibility of the federal government continues to be called into question.

The most disturbing aspect of the Amchitka tests, however, has been the willingness of the AEC to proceed in the face of as yet unanswered questions about the possibility of the nuclear tests setting off earthquakes and tidal waves, and leaking radiation into the ocean and the atmosphere.

Until last spring, the AEC was denying that underground tests could set off earthquakes. Then, they were proven wrong. Scientists at the annual meeting of the Ameri-

can Geophysical Union reported that two nuclear tests in Nevada had set off earth tremors up to 1,200 miles away from the explosion site. One of the tests, called "Boxcar," caused a fracture in hard rock 4,900 feet from the explosion, creating a "fault" nearly three miles long.

Now, AEC has a new position: Underground nuclear tests probably won't set off big earthquakes.

Amchitka is a good place to find out the hard way whether this statement is valid.

For one thing, the 1.2 megaton "calibration" shot with which the AEC will launch the Amchitka series is as large as any underground test ever conducted in this country, an indication of the dramatic turn of our nuclear weapons testing program toward larger and large shots. The "calibration" shot will have an explosive force equal to 1.2 million tons of TNT and will be 60 times the size of the atomic bomb dropped on Hiroshima to finish World War II.

Information in an underground nuclear testing report published by *Environment* magazine in St. Louis, Missouri, indicates that future Amchitka blasts could range as high as high as five and a half megatons, five times larger than any U.S. underground test to date, and 300 times larger than the Hiroshima bomb. The *Environment* magazine report was prepared by the Committee for Environmental Information, a respected scientific group.

Secondly, unlike the Nevada testing grounds, Amchitka is in the heart of one of the most earthquake-prone regions in the world. The last sizable earthquake in the area was reported less than one month ago.

Last May, a severe earthquake of 6.7 on the Richter scale hit the area, and a tidal wave alert was issued for Adak, Amchitka, and Shemya Islands. The shock's epicenter was only a few miles from Amchitka.

On February 4, 1965, the largest earthquake to occur anywhere in the world that year originated 20 miles from Amchitka, measuring 7.75 on the Richter scale.

Some distance away, the Great Alaskan Earthquake of March 28, 1964, hit, killing 113 people and reaching 8.3 on the Richter scale.

Significantly, a one megaton test in Nevada—nearly the same size as the shot scheduled this week on Amchitka—had an impact measuring 6.5 on the Richter scale. If later nuclear blasts at Amchitka reach five megatons, the impact will be about 7 on the scale, a shock comparable to that of a major earthquake.

Coupled with the earthquake danger is the possibility of a tsunami, a tidal wave. Again, Amchitka is in the center of an area notorious for its history of generating these waves, one of the most destructive and terrifying forces in nature. A 1946 Aleutian earthquake, for instance, caused a tidal wave that reached a height of 44 feet in Hawaii. A 1960 earthquake-induced tidal wave from the Aleutians also reached Hawaii, killing 60 people.

The Alaskan earthquake of 1964 produced a tidal wave that reached 30 feet in height along the Alaskan coast and caused damage as far south as Crescent City, California.

The tidal waves are not only a threat to people and property, but can devastate valuable natural resources and whole coastlines. A tragic example was the 1964 Alaskan tidal wave, in which, according to a report to the President, "walls of water surged into estuaries, scouring out beds of clams and other life in some areas, and elsewhere depositing layers of mud and debris that suffocated underlying life."

Independent scientists are refusing to rule out the danger that the Amchitka tests could kick off major earthquakes and tidal waves. And even the AEC talks in terms of probabilities, rather than uncertainties.

Far more complete assessments of earthquake and tidal wave dangers from under-

ground nuclear testing have been made by the federal government, but, unfortunately, these reports have never been made public. One such study was presented to the President's Science Adviser last fall and remains confidential, even though the chairman of the study committee has said that it could easily be released after editing and removal of classified information. Also, I understand, another report—prepared for the AEC by a special advisory committee—was scheduled for completion last summer.

In view of the imponderables which continue to surround our entire underground testing program, Congress should insist that these reports be made public immediately. If the underground tests pose no dangers, it is in the best interest of AEC to let it be known. If they do threaten problems, however, it is in the interest of Congress and the American public to know and have the opportunity to weigh the risks.

Another "imponderable" facing the Amchitka test series is whether radiation could be vented to the Pacific and to the atmosphere. In the past, even deeply buried nuclear explosions have on occasion released radiation into the air. In view of Amchitka's relatively close proximity to Canada, Japan, and Russia, a large-scale release from a test could well cause a violation of the Nuclear Test Ban Treaty, which says treaty signers shall not cause radioactive material to be present beyond their own boundaries.

Another radiation concern is the possibility that tests in the watery Amchitka area could produce fracture zones in the rock extending to the Pacific floor, affording ocean waters easy access to the radioactive zone where they could become highly contaminated. Circulation would then spread the radiation to other areas of the Pacific.

Just recently, the manager of the Aleutians wildlife refuge pointed out that Amchitka's waters are a major feeding ground for the Pacific salmon. At some stage in their lives, each of the 19 million salmon in the Bristol Bay Run probably feeds near Amchitka, he added.

Could an Amchitka test lead to contamination of this vital international resource? Again, another unanswered question.

For these reasons, the Amchitka tests are a classic example of our insistence on plunging ahead with new technology at any cost and in the face of great potential dangers. Speak the words "national security," and any risk becomes worthwhile. Far too often, defending the public health and welfare and defending the environment have been overlooked in the rush.

In all fairness, the dangers we face with the Amchitka tests are not solely the blame of the AEC and the Department of Defense. The fault lies in our failure to provide the mechanisms to insure that, while the AEC pursues its mission of promoting and developing nuclear power, all the risks will be adequately taken into account.

However, Congress is now on the verge of taking a major and precedent-setting step in the right direction. Now close to final enactment is a bill which would establish in the White House an independent, Presidential-appointed Board of Environmental Quality Advisers. This group of experts would review Federal activities to assure their compatibility with the natural environment and other important concerns. The bill also contains an important provision which would spell out in law a national policy on the environment to halt environmental abuse by Federal activities.

If the Board is created, as I believe it will be, I will urge that its first task be an immediate, thorough review of our underground nuclear testing program and its effects on the environment, on our safety, and on our international relations. The Board would make its report and recommendations to the President, Congress, and the American

public, so that a determination could be made on whether underground testing can safely continue.

The same purpose could also be readily accomplished by the proposal before this committee by my colleagues, Senators Gravel and Fong, to set up an independent, Presidentially-appointed commission to study and report on the underground tests. Or, the review and report could be done by Presidential initiative.

In the interim, all nuclear testing, including the Amchitka tests, should be halted. The cost of continuing in the face of the grave questions that have been raised by distinguished scientists and environmentalists, and by other countries, could be great.

Especially since Congress has not finally enacted the authorization for the Safeguard ABM, I believe a delay in development of the ABM warhead can certainly be justified. The evidence is strong that the Amchitka tests are for the ABM development.

Furthermore, it is evident that as we turn to larger and larger tests, such as those scheduled in the Amchitka series, the dangers of some great disaster—from an earthquake, a tidal wave, environmental destruction, a massive venting of radiation that could violate our treaty obligations—will inevitably increase.

In view of this, as well as the painfully obvious need to put a halt to the dangerous and spiraling arms race, I believe we should immediately begin exploration of the idea of a treaty to ban underground nuclear weapons testing.

THE PESTICIDE PERIL—LVII

Mr. NELSON. Mr. President, considerable evidence has been presented which clearly attributes the growing extinction of some species of wildlife to the accumulation of persistent, toxic pesticides in the environment. This evidence is not only true of species whose natural habitat is in direct contact with man, but is also true of species who never come into direct contact with man or the mainland, such as the Bermuda petrel.

An article published in a recent issue of Science tells the results of a study where the patterns of reproductive failure in declining populations of several European and North American wildlife species were duplicated experimentally with captive American sparrow hawks that were given a diet containing two commonly used organochlorine insecticides, DDT and dieldrin. The article reports that major effects on reproduction were increased egg disappearance, increased egg destruction by parent birds, and reduced eggshell thickness.

I ask unanimous consent that the article be printed in the RECORD.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

[From Science magazine, July 11, 1969]

DIELDRIN AND DDT: EFFECTS ON SPARROW HAWK EGGSHELLS AND REPRODUCTION

Marked declines in populations and reproductive success of several species of North American and European raptors have occurred during the past two decades (1-3). These declines have been attributed to effects of organochlorine insecticides which these birds obtained from their food and accumulated in their tissues (1, 3-5). Reproductive failures of some species were associated with significant decreases in eggshell thickness (6-7) and, especially in British species, with marked increase in

frequency of egg-eating and of egg breakage in the nests (5, 8). These changes were ascribed to alterations in calcium metabolism of adult birds (7).

We have investigated effects of two sublethal dietary levels of DDT and dieldrin (9), in combination, on reproductive success of captive American sparrow hawks, *Falco sparverius* and the influence of these chemicals on eggshell thickness.

The sparrow hawk was selected because it had been bred successfully in captivity on a limited scale (10), was relatively abundant, was easily handled and sexed, and was closely related to the peregrine falcon *F. peregrinus*, a declining species of raptor (1).

The principal experimental group consisted of 27 pairs of hawks, all obtained as fledglings in the summer of 1964 from the Northeast and maintained as pairs since early in 1965. Nine pairs of these birds were randomly assigned to each of three treatments—control, low dosage, and high dosage (11). An additional group of nine pairs of hawks that had a heterogeneous history and were housed at a different location were randomly assigned, three pairs each, to the same treatments as the principal group. Females of this latter group were birds caught from the wild in Florida in the winter of 1965-66; males were produced by the parent colony in 1965 before dosage began on 11 March 1966.

Low dosages represented amounts equal to residues often found in raptor food items in the field (12). High dosage was calculated to be just short of lethal to adults and it was equivalent to that obtainable in the field, at least in some areas containing prey items with unusually high pesticide residues (13).

Birds of both sexes were carried over from one year of the experiment to the next. Females that died during the experiment were not replaced. Males that died during the ex-

periment were replaced at the onset of each reproductive season. Dosed males that died were replaced with males of the same treatment when available; otherwise, they were replaced with nondosed males.

In 1968, reproduction of first-generation (yearlings) hawks was investigated. These hawks were produced by the experimental colony in 1967 and were retained on the same diet as their parents. The 24 pairs of hawks used in this experiment were selected on the basis of body condition. In pairing them, the heaviest females were mated with the heaviest males to insure successful pairing. Siblings were not paired with each other. Dosages were randomly assigned to pens. In respect to age and history of pesticide exposure, yearling hawks were our most homogeneous group.

To determine whether a mixture of DDT and dieldrin could cause thinning of eggshells, we marked the first egg laid in each clutch, where possible, of both the parental and yearling groups in 1968, and removed it after the third egg was laid and before incubation was begun. All eggs collected were frozen, and their contents were removed later. The remaining albumen was then gently washed from the inner shell surface, so as not to disturb the shell membranes. Shells were then dried at room temperature for several weeks. Thickness of each shell plus its membranes was measured to the nearest 0.01 mm at four points around its equator with a micrometer, and these measurements were then averaged.

Reproductive success of untreated hawks in 1967 and 1968 was equal to that of a wild population, except for that of parental birds in 1968 (14). Reduced success of the parental group in 1968 was due mainly to embryonic mortality (Table 1) which may have been caused by bacterial infection of the eggs (14).

TABLE 1.—REPRODUCTIVE SUCCESS OF TREATED SPARROW HAWKS. DATA WERE ANALYZED BY CHI-SQUARE AND PRESENTED AS NUMBERS OF BIRDS OR EGGS

[Abbreviations: C, control; L, low dosage; H, high dosage (1.1)]

Category	Parental group												Yearling group 1968		
	Northeastern females						Florida females								
	1967			1968			1967			1968			C	L	H
Pairs (clutches).....	8	8	7	8	8	7	2	3	3	2	2	3	8	8	8
Eggs laid.....	40	40	33	39	40	32	10	14	13	10	10	13	41	33	42
Eggs taken for study.....	0	0	0	8	8	7	0	0	0	2	2	3	8	6	8
Eggs incubated.....	40	40	33	31	32	25	10	14	13	8	8	10	33	27	34
Eggs disappeared.....	1	7	29	2	8	210	0	2	2	0	0	0	0	27	24
Eggs remaining.....	39	33	24	29	24	15	10	12	11	8	8	10	33	20	30
Infertile eggs.....	1	0	3	1	2	2	0	1	3	1	0	0	2	1	2
Dead embryos.....	6	9	2	13	6	3	0	2	0	2	5	6	3	0	49
Eggs hatched, of eggs incubated.....	32	24	19	15	16	10	10	9	8	5	3	4	28	19	219
Young fledged.....	30	22	18	13	13	4	7	8	7	4	3	4	28	19	413
Of eggs incubated.....	30	22	18	13	13	4	7	8	7	4	3	4	28	19	413
Of eggs hatched.....	30	22	18	13	13	4	7	8	7	4	3	4	28	19	413

¹ May include disappearance of some young early in the posthatching period.

² Significant difference between dosed group and controls at P<.05.

³ Refers to eggs without obvious embryonic development.

⁴ Significant difference between dosed group and controls and also from other dosed group at P<.05.

⁵ Significant difference between dosed group and controls at P=.06.

⁶ Significant difference between dosed group and controls at P=.07.

The influence of the pesticides on reproductive success was greatest in the yearling group (Table 1). Differences between yearling control and yearling dosed birds were significant (P<.05) at most major points of their reproductive cycle (Table 1). The same trend was apparent in the parental group in both 1967 and 1968 (Table 1), but differences between control and dosed groups were not always significant (P<.05).

The crucial factor responsible for reproductive failure of dosed birds was disappearance of eggs through time of hatching and may have included the disappearance of some newly hatched young. Differences in egg disappearance between dosed and control hawks were significant (P<.05) in most experimen-

tal groups (Table 1). Egg disappearance probably was due to breakage of thin-shelled eggs and to eating of eggs or newly hatched young by parent birds. Reproductive failures in declining populations of British raptors were similarly characterized by egg disappearance, egg breakage, and egg-eating by the parents (8).

Eggshells of dosed birds of the parental generation in 1968 were thinner by 8 to 10 percent on the average than those of controls of the parental group; eggshells of the first-generation dosed birds were thinner by 15 to 17 percent on the average than those of first-generation controls (Table 2). These differences were significant in both the first (P<.01) and parental (P=.056) generations