avoided even by birds driven from other places. These birds fly toward the trees as if to settle, but veer off before alighting, as though there were some warning odor on the trees. This may seem strange in view of the prevalent opinion that birds lack olfactory sensitivity, but this opinion may not be correct (*2, 3*).

The use of a distress call or alarm call as a repellent may not be entirely new, but the method of application seems to be. Shooting at starlings drives them away if consistently continued (*1*), but this is expensive, dangerous, and harmful to protected species. It is certainly the sound that repels the birds, and recording with subsequent rebroadcast would obviate these difficulties.

If the general principle proves valid, it may be possible to repel other birds from objectionable roosts or from molested crops by using their distress calls. It might also be possible to use similar means to repel rodents or other mammals, or even insects such as moths (*4*), if ultrasonic frequencies are recorded and broadcast.

As far as starlings are concerned, this report must be considered as preliminary. Tests must be made in large cities, and the best times and methods of application must be determined. These studies indicate a lasting effect following the treatments, but only time will tell how lasting. Finally, much further work is needed on the habits of starlings and other pests, for this knowledge is the key to ultimate success in controlling them.

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Current Volcanic Activity in Katmai National Monument

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The combination of geological and meteorological circumstances which on July 9, 1953, caused a ¼-in. layer of volcanic ash to be deposited on the city of Anchorage (*1, 2*) focused popular attention on volcanic activity at the northern end of the Aleutian Range. The daily routine of a city of 50,000 population was unbalanced, the power and water supplies were partly disrupted, and air traffic was temporarily halted at three of the nation's busiest fields by a single, relatively minor volcanic eruption. This incident served to point up the timeliness of the National Park Service's emphasis on volcanology in investigations in Katmai National Monument during the summer of 1953 and the pertinence of the extended studies in the Aleutian Range by the Geological Survey's Volcano Investigations Unit (*3*).

Within the limits of the Monument are 15 recently active volcanoes. The spectacular activity in February of one of these, Mount Trident, has subsided to slow extrusion of very viscous blocky lava, accompanied by steady vigorous steaming. Six other volcanoes, Martin, Mageik, Novarupta, Knife Peak, Kukak, and Douglas, steamed with varying degrees of intensity during the summer of 1953.

Air photographs taken in July, 1951, showed Mount Trident, an eroded volcano without historical record of previous eruption (*4*), to be steaming from a vent at an altitude of approximately 3600 ft, southwest of its middle peak. On February 15, 1953, activity of this vent entered a violent phase that continued for several days with a series of explosive eruptions sending clouds of steam and ash to altitudes of 30,000 to 35,000 ft. Although the volcanic clouds were not visible from Kodiak, they were clearly seen and photographed from King Salmon, 70 mi to the west-northwest. On February 18 aerial observers noted a flow of viscous lava being extruded from the vent. During subsequent months the plume of steam and ash was frequently seen, rising a mile or two above the cone.

On June 19 a base camp was established on Knife Creek near the foot of Trident Volcano. From this point short trips were made throughout the Monument, and all the major peaks were visited.

From June to September Trident's activity was marked by quiet extrusion of lava accompanied by steady, moderately vigorous steaming. The flow is dark brown and blocky on the surface, but it continues to steam from hot viscous lava beneath. The flow continued to spread on the west margin, greatly increasing in volume without any evidence of abatement toward the end of the summer. Quiet steaming continues both from the new fumarolic area at an elevation of 4200 ft southeast of the middle peak (*5*) and from a large fumarole several hundred feet downslope (*6*). There is no sign of lava extrusion at either fumarole, but marked incrustation of yellow sublimates has occurred at the upper one.

During June Trident's plume of steam was visible on clear days from the shore of Bristol Bay, 80 mi to the west. Several times, with suitable winds, it spread far enough west to restrict visibility at King Salmon, and in early June traces of ash were reported on the vegetation 90 mi west-southwest at Egegik. On July 12 streamers of pyroclastic material were reported falling from the plume near the cone. In general, however, the cloud consists principally of steam with occasional small amounts of ash. Within a radius of about 10 mi of the cone, an inch or more of ash from the February eruptions mantles late-lasting snowdrifts, retarding their melting to about one-fifth of the normal rate.

In recent years Mount Martin, a 6050-ft peak 11 mi southwest of Mount Trident, has been one of the steadiest performers in this part of the Aleutian

[1] Deceased.

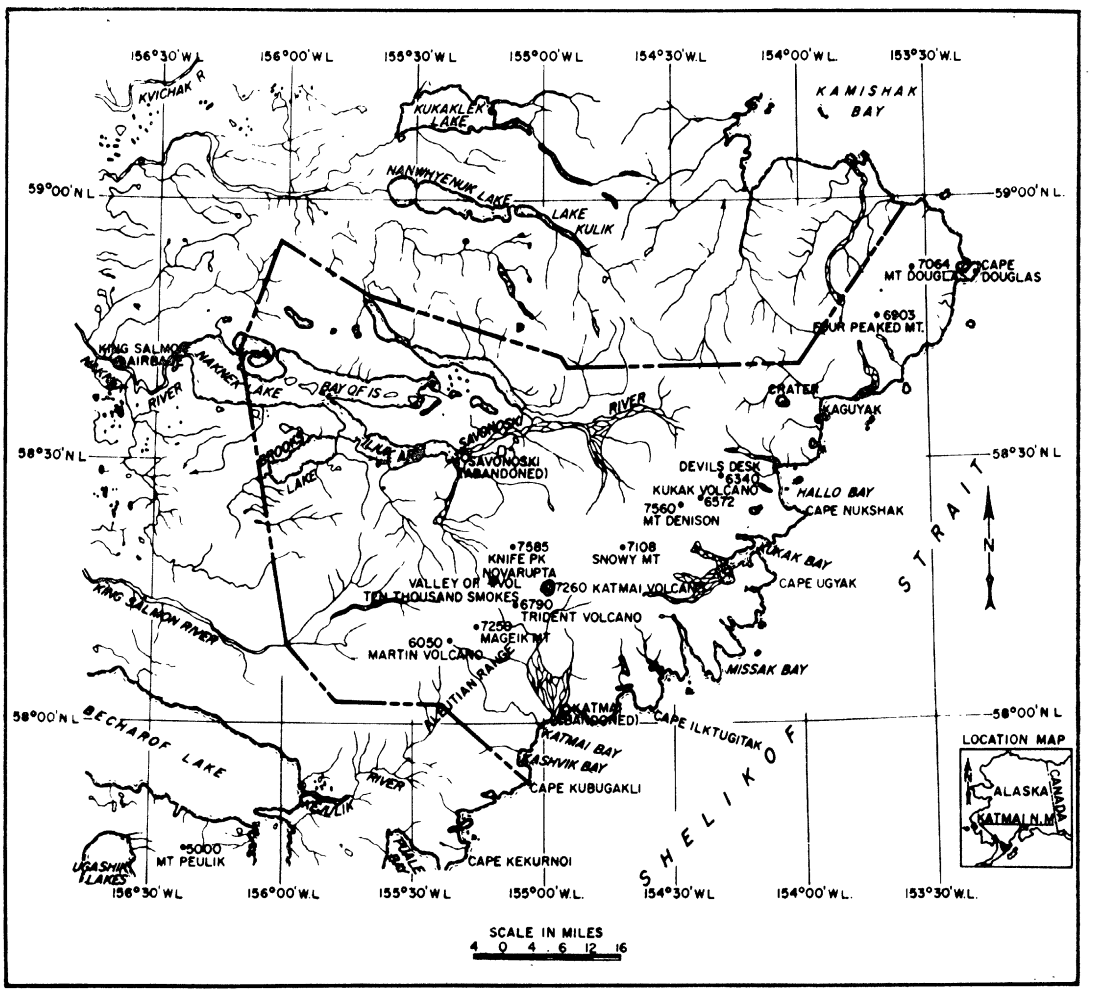

FIG. 1. Katmai National Monument showing location of active volcanoes.

Range. Because of Mount Martin's location, some of its activity has been incorrectly attributed to its larger neighbor to the northeast, Mount Mageik. Probably both the ashfall at Kukak Bay on July 22, 1951, and the eruptions reported as occurring simultaneously with Mount Trident's activity in February, 1953, came from Mount Martin. During the second week of July, Mount Martin was observed to be steaming steadily and with moderate vigor, although its plume was less conspicuous than that of Trident. During this interval, only quiet steaming occurred at the crater near the crest of Mount Mageik.

During July mild fumarolic activity was reported near the crest of Knife Peak by James Mulkern, a pilot with a topographic survey unit of the Army Corps of Engineers. This peak has no history of more vigorous activity.

Kukak Volcano, which had been steaming steadily, emitted a single large puff of steam on July 22 according to the captain of the Fish and Wildlife Service's ship, *Dennis Wynn*. At the end of July considerable steam was escaping from large caverns in Hook Glacier on the flank of Kukak Volcano, possibly indicating the position of newly activated vents.

Activity at the northeast end of the Alaska Peninsula is limited to quiet steaming from several small vents near a crater lake at the summit of Mount Douglas.

Although Mount Katmai is at present apparently inactive, it retains considerable latent heat, for the crater lake is reported to remain unfrozen even in midwinter. Novarupta, a dome of viscous lava 5 mi southwest of Katmai Crater, continues to steam very mildly, but there is no evidence of the more violent activity suggested in early reports of the February eruption of Mount Trident. A system of fissures in arcuate arrangement around Novarupta from west to northeast is marked by many small fumarolic vents. Activity in the Valley of Ten Thousand Smokes has lapsed except for a few remaining fumaroles.

Popular accounts have tended to sensationalize recent eruptions in the northern part of the Aleutian Range. Increased air traffic and gradual settlement of adjacent areas make it less probable that an eruption

would escape detection today than a few decades ago. No activity during the course of this season or recent seasons has been of the order of magnitude of the explosive eruption of Mount Katmai in June, 1912. That eruption partly destroyed one of the highest peaks in this portion of the range, created a crater 1½ mi in maximum dimension, and ejected 25 to 50 times the volume of material involved in Trident's February eruption (7). The greater frequency of mention of volcanism in this area during recent months probably reflects a more general awareness of the activity but not necessarily greater frequency or intensity of eruptions.

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Filtration of Embryo Extract for Tissue Cultures[1]

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The discipline commonly called "tissue culture" has long suffered from the apparent complexities of its procedures. Bryant, Earle, and Peppers have recently published on "The effect of ultracentrifugation and hyaluronidase on the filtrability of chick-embryo extract for tissue cultures" [*J. Natl. Cancer Inst.* **14**, 177 (1953)], which we wish to commend as a contribution to mass technics. We should like to note, however, that many of the complicated procedures and the correspondingly expensive equipment described may be omitted.

We have been using hyaluronidase-treated chick-embryo extract in the maintenance of Earle's "strain L" cells for about 8 mo.[3] Our cultures show a uniform cellular increase of sufficient rapidity to require subculturing (dividing into 3–10 aliquots, usually 6) at about 10-day intervals. This is not the maximum proliferation rate, which is not required for maintaining stock cultures.

Our procedure is as follows: We open a dozen "fertile" eggs, incubated 10 days. These will usually provide 8–10 embryos which are collected in a small Petri dish. They are then dropped into the barrel of a 20-ml Luer syringe. We do not use a screen insert. The plunger is inserted and the tissue pulp forced into 15-ml conical Pyrex centrifuge tubes, allowing about 5 ml of pulp per tube. No complex grinders are needed. We then add an equal quantity of Earle's balanced salt-dextrose solution, stir thoroughly with a spatula or glass rod, and place in the refrigerator at +5° C overnight. No freezing with CO_2 is required. The following day the extract is separated by centrifuging for 10 min at about 3000 rpm. No ultracentrifugation is needed. The clear supernatant is decanted, and can either be used immediately in the preparation of nutrient (which is our usual practice), or can be stored in the freezing part of the refrigerator at −15° C.

The complete nutrient comprises 1 volume of extract, 2 volumes of horse serum, and 7 volumes of balanced salt solution. About 10 mg of hyaluronidase are added to each 100 ml of nutrient, and the whole is filtered through a Selas candle of No. 03 porosity. We do not use a pressure filter. A water pump or mechanical vacuum pump is satisfactory, but the vacuum should be kept below 250 mm of mercury by use of a bleeder valve. One hundred and fifty milliliters of nutrient will filter without clogging a 2-in. filter and with almost 100 percent yield in about 10 min. The clear sterile filtrate is drawn off into tubes and either used immediately or stored at +5° C. A dozen eggs will usually provide about 15 ml of embryo extract (1:1) or 150 ml of complete nutrient. The solution has a final composition of 10 percent embryo extract, 20 percent horse serum, and 70 percent balanced salt solution. This is only half as concentrated for both embryo material and serum as recommended by Bryant *et al.*, yet we find it entirely satisfactory for routine maintenance of "strain L" cells in 3.5-cm Carrel flasks without substratum (cells growing directly on glass, no cellophane or clot). It is also to be noted that we do not "gas" the nutrient or the flasks with a special gas mixture. Air is quite satisfactory.

In this procedure we have utilized three of the steps recommended by the above authors: a Luer syringe as a grinder, hyaluronidase as a depolymerizer, and filtration through the No. 03 Selas candle. We have eliminated the use of a wire screen in the syringe, preliminary freezing with CO_2 ice, grinding in a Potter-Elvehjem grinder, ultracentrifugation, use of a pressure filter, and gassing of the culture flasks. The equipment needed is to be found in most laboratories. The procedures can be carried out by a student after a little instruction. We believe that the results are not inferior to those obtained by more complex methods.

It is our belief that many of the difficulties encountered by Bryant *et al.* have arisen from the series of procedures used. If one presses tissue through a 24-mesh wire screen, then freezes in CO_2 ice, and grinds in a Potter grinder, one obtains a suspension containing much fine particulate matter which clogs the filter. It is doubtful if this excessive trituration provides any

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[3] We are indebted to Dr. Earle for communicating to us information on the use of hyaluronidase for this purpose prior to publication.