and selective solidification, the anticyclonic wind action would certainly give a radial distribution of material with considerable uniformity. A similar case is the radial distribution of snow to form the ice barrier which smooths the ragged edges of the Antarctic Continent. Here a new type of rock (ice) is formed and deposited through thermal, chemical and mechanical processes somewhat like those which probably acted to produce the original continental structure.

GEORGE W. MUNRO

PURDUE UNIVERSITY

PROTECTION FROM MOSQUITO BITES IN OUTDOOR GATHERINGS[1]

THE adult female mosquito has been the pest of mankind since time immemorial. In areas where mosquito eradication is not conducted at all or only to a limited extent, prodigious numbers of mosquitoes on the wing offer a great menace to our health and comfort, making it practically impossible to spend a summer evening outdoors without being badly bitten up. Some individuals are so highly susceptible to the after effects following these bites, which usually cause irritation and swelling, that they are afraid to leave their houses, screened porches and similar protected enclosures in the evenings. While the mosquito annoyance is especially unbearable in farm communities and suburban districts, towns and cities are by no means free from it.

The problem of temporarily ridding a small area of adult mosquitoes where a large number of people could comfortably enjoy a summer evening has often presented itself. Such places may vary in area from a few square yards to several acres and may consist of a well-cared-for lawn, shrubs, flowers, trees and other valuable vegetation which must not be injured. It is obvious that in order to eliminate mosquitoes the area must be treated in such a way that those on the wing or resting in the grass within the area are killed or incapacitated, while those outside of the treated area are repelled.

The New Jersey mosquito larvacide[2] contains a light petroleum oil and pyrethrum and has been extensively applied during the last three years in exterminating larvae and pupae in waters without injury to fish, water-fowl and vegetation. Pyrethrum was shown to be toxic[3, 4] as well as repellent[4] to adult mosquitoes. Furthermore, it had been observed by many mosquito workers that the female mosquito will not lay eggs on water covered with kerosene or fuel oil. Evidently light petroleum oil also possesses repellency against the adult mosquito. In view of the above properties it was conjectured that the larvacide, applied as a diluted spray over the entire area where the meeting takes place, might prove effective and economical for temporary protection.

Accordingly experiments were conducted with various dilutions of this larvacide. Up to date the writer has records of some 50 tests on areas ranging from a few square yards to 5 acres, involving evening gatherings of from 10 to 2,000 people. The results indicate that it is quite possible and economical partially or completely to protect an outdoor gathering such as carnivals, picnics, open-air theaters, lawn parties, etc., from mosquito annoyance by spraying the area with the larvacide diluted 1:10 or 1:12 with water without any appreciable injury to vegetation and without discomfort to the audience. The spray is applied in the form of a fine fog, covering the grass, ground, shrubs, as well as throughout the air.

DIRECTIONS FOR SPRAYING

About half an hour before the gathering takes place the area is completely sprayed with the larvacide diluted 1:10 or 1:12, that is 1 part of larvacide is mixed with 10 or 12 parts of water. The spraying is done with a power sprayer capable of developing a pressure of 100 pounds or more per square inch and equipped with a spray gun. Before mixing with water the concentrated stock larvacide should be well shaken. Also the diluted spray should be frequently stirred or agitated in order to secure uniform distribution throughout the spraying operation. The spray is applied in the form of a fine fog directly to the grass, grounds, tents, trees, shrubs, etc. Then the stream is directed upward so as to saturate the atmosphere with the fog. At no time should a coarse spray be applied, since it is unnecessary and may injure vegetation. The grounds for about 20 feet outside the area should also be thoroughly fogged, especially when tall grass, shrubs, woodland and other vegetation are present offering a hiding place from which adult female mosquitoes may issue suddenly at dusk in large numbers. If the area has been thoroughly fogged one treatment may suffice for two hours or even the rest of the evening. If mosquitoes become bothersome later in the evening, the area on the outside of the "gathering" grounds should again be fogged, directing the stream primarily upward and towards the ground to be protected. This outside fogging may be repeated again if necessary. On small areas, such as back-yards, private lawns, etc., a knapsack sprayer or bucket pump capable of producing a fog spray, of 10 to 15 feet high, can be used.

[1] Paper of the Journal Series, New Jersey Agricultural Experiment Station, Department of Entomology.

[2] J. M. Ginsburg, *Proc., 17th Annual Meeting N. J. Mosq. Ext. Assoc.*, p. 57, 1930.

[3] J. M. Ginsburg, *Proc. 21st Annual Meeting N. J. Mosq. Ext. Assoc.*, p. 21, 1934.

[4] J. M. Ginsburg, *Proc. 22nd Annual Meeting N. J. Mosq. Ext. Assoc.*, 1935.

In one experiment a five-acre fair ground surrounded with shrubs and woodland was sprayed five evenings in succession. On the night before spraying was started the mosquitoes were so numerous and vicious that many people were forced to leave the grounds about 9 P. M. During the succeeding evenings, when the larvacide was applied, discomfort from mosquitoes was insignificant and the audience was well pleased. Subsequent observations have disclosed practically no injury to the shrubs and trees and only slight burning to the grass blades.

Thus far the larvacide was found effective against the following species of mosquitoes: *Culex pipiens, Aedes vexans, Aedes sollicitans* and *Mansonia perturbans*. Tests will be conducted against other species whenever available.

The formula of the present New Jersey mosquito larvacide, which has been recently improved[5] to be compatible with hard and salt water, is as follows:

FORMULA FOR TANK PREPARATION

100 gallons kerosene containing pyrethrum extract equivalent to one pound of flowers (analyzing 0.9 per cent. pyrethrins) per gallon.
50 gallons water.
6 pounds sodium laurel sulfate (emulsifier).

The emulsifier is first mixed with the water and transferred to the tank. The oil is then run in gradually into the tank with agitators and pump working at full speed. After all the oil has been added the pumping is continued until the entire mixture has passed through the hose and back into the tank two or three times or until the mixture is thick and homogeneous, showing no free oil on the surface. The finished product is then pumped into drums for storing. This constitutes the stock emulsion. Excessive foaming may be eliminated by dissolving about two or three pounds of wool grease (Degras) in the kerosene before emulsifying. Any other suitable apparatus for emulsification can be used.

The cost of preparing the concentrated emulsion is about 23 cents per gallon, based on the present price of pyrethrum, which makes out slightly over 2 cents per spray gallon. When purchased, the stock emulsion costs from 30 to 50 cents per gallon, depending on the quantity ordered.

While this larvacide, when prepared and applied as directed, is apparently safe on vegetation, as brought out by the results thus far reported, further experiments are at present conducted in order to verify the above findings under all kinds of conditions and on many varieties of plants.

JOSEPH M. GINSBURG

RUTGERS UNIVERSITY

[5] W. Rudolfs, *N. J. Agr. Expt. Station Bulletin 496*, 1930.

ORIGIN OF THE GENUS NAME RIBES

THE Latin name at present used for the common cultivated red currant is *Ribes sativum*. The genus name Ribes, for which one does not find in any of our dictionaries a derivation both adequate and correct, is derived from the Arabic through a curious chain of circumstances.

From very early times the Arabs have held in high repute a medicine prepared from a species of rhubarb native in the mountains surrounding the Arabian desert and cultivated in Arabian gardens. The Arabic name of the plant was rībās. The young stems and young leafstalks were crushed and the juice was extracted by pressure and made into a syrup by boiling slowly with an equal weight of sugar. This acidulous syrup was an article of commerce among the Arabs and its use by them was wide-spread.

I should like to be able to say that, after their conquest of Spain in the eighth century, the Arabs, not finding in western Europe the plant from which their favorite syrup of rhubarb was made, but finding another plant, the red currant, from which a similar syrup was prepared, gave to the new plant the Arabic name ribas, transferred from the much-beloved rhubarb native in their own country. I have no means to make certain, however, whether the name ribas reached western Europe from Arabia by this romantic route or whether it traveled overland, north of the Mediterranean, by some non-Arabic road. It seems clear, however, that it was from the similarity of the two syrups that the Arabic name came to be applied by early European botanical writers to their native red currants, in the Latinized form ribes. The Arabic name of the rhubarb syrup was rubb rībās or robb rībās (pronounced rahb reebahs), the Arabic word rubb standing for syrup and ribas for rhubarb. When this name was transferred to western Europe and applied by apothecaries to the syrup made from red currants, it took the form rob ribes, or the form preferable in Latin, rob ribis, ribis being the genitive of ribes, the expression meaning, literally, syrup of ribes. Then, having misappropriated the name rob ribis, doubtless unconsciously, for their own native syrup, the west-European apothecaries gave to the genuine and original product of Arabia the name rob ribis Arabum, syrup of ribes of the Arabs. A very neat and exact summary of facts about the Arabian rhubarb is contained in its descriptive designation by Desfontaines, paraphrased from the part-Latin, part-German, description by Rauwolf in 1583, "ribes Arabum, ex quo rob ribis conficiunt," ribes of the Arabs, from which they make their syrup of ribes.

When Linnaeus, coming after the early European botanical writers, published his "Species Plantarum," in 1753, he gave to the rhubarbs the genus name