as *R. saxatilis*, var. *canadensis*. *R. pubescens* Raf., being the earliest specific name for the plant in question, should, according to the above cited article of the Vienna Rules, stand as the valid designation of the species.

WESTMINSTER, VERMONT.

EXCRETION OF SODIUM CHLORIDE BY SPARTINA GLABRA ALTERNIFLORA.

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WHILE at the Atlantic Coast Marine Biological Station at St. Andrews, New Brunswick, this summer (1909), I noticed that the leaves of *Spartina glabra alterniflora* (Loisel.) Merr., growing in a brackish marsh, had an abundance of crystals upon them. Upon scraping off some of these crystals and tasting them I found that they had the characteristic taste of Sodium chloride, and examination with a lens showed that they were cubes.

Although it struck me that the salt had been excreted by the leaves, I thought that (as it was at the time low tide, and the tide there rises from twenty-three to twenty-eight feet) possibly the plants were submerged at high-tide, and that the salt was deposited upon the leaves while they were submerged. So I returned to the marsh at high tide and found that the state of the tide made practically no difference in the level of the water in the marsh. I examined all the other species in the marsh carefully but failed to find any crystals upon them.

I then took some of the leaves to the Laboratory, cleaned them thoroughly, and placed the cut end of one in fresh-water and of the other in sea water over night. In the morning both had a large number of crystals upon them, there being however more upon the one placed in sea water than upon the other. That they formed at all upon the leaf placed in fresh water showed that there must have been a remarkable concentration of salt in the tissues of the leaf. I noticed that the great majority of the crystals were in the grooves of the leaves, there being however some upon the carinae.

I removed the leaf from the sea-water, cleaned it carefully, watched

it closely through a lens and soon observed minute droplets of solution appearing at intervals along the grooves. I held a portion of the leaf, upon which were several droplets, tightly upon my finger and noticed that the heat of my finger caused a little water to evaporate and that a cubical crystal formed, which was nearly as large as the droplet had been. I repeated this operation some twenty times, and found out how it was that some of the crystals were upon the carinae, for when a large drop evaporated it did not form a single large crystal, but formed four small ones, two of which were deposited upon the top of each ridge which bordered upon the groove.

Next I brought three entire plants to the Laboratory, cleaned one thoroughly of all crystals, and placed their roots in sea water. The next three days were foggy and the droplets excreted by the specimen which I had cleaned off remained as such, while the crystals on the other two specimens deliquesced. But on the fourth day the weather was dry and crystals appeared abundantly on all three plants.

I again cleaned off a leaf of the plant from which I had previously removed the crystals, and placing it over my finger watched the droplets emerge and the crystals form.

I then tested some of the juice of the leaf with $AgNO_3$ and got a heavy white precipitate which was insoluble in HNO_3, thus showing an abundance of chlorides. The solution excreted by the leaf gave an even heavier precipitate. Further than this very rough analysis I was unable, on account of lack of reagents, to carry my chemical investigations.

Some portions of leaves I fixed in chromo-acetic solution, brought them to our Botanical Laboratory, imbedded in paraffin and made sections in three planes to see if water-pores were present. I found that they were not, but that stomata were abundant and had very large intercellular spaces beneath them. The stomata are situated mostly near the bottom of the grooves. The grooves are very deep and have numerous small epidermal projections upon their walls.

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