craft against destructive insects. An airplane has been used to dust such crops as cotton with insecticides and has helped to rid forests of pests, particularly in Canada. But not before has it been used against migrating insects. It will carry 300 pounds of sodium arsenite. The method will probably be to overtake a swarm at a high altitude, descend to its level and spread a curtain of fine powder before it. The powder is expected to remain suspended for some time and to cause heavy casualties in a long column.

DISCUSSION

MOVEMENT OF PIGMENT GRANULES IN CHROMATOPHORES

SUMNER[1] proposed to designate the pigment granules in a chromatophore a "chromatosome," and movement of the granules out into the branches of the chromatophore "expansion of the chromatosome" and movement in the opposite direction "contraction of the chromatosome." I presented evidence in opposition to this terminology.[2] Sumner[3] does not agree with me in the conclusion reached on the basis of this evidence. He appears to agree with me, however, in the contention that a chromatophore is somewhat like a branched, heavy-walled rubber tube closed at the distal ends of the branches and at the other end joined to a heavy-walled rubber bulb filled with pigment granules suspended in a fluid, and that movement of the granules in the chromatophore is due to action in the heavy walls which surround the cavity containing the granules. But he maintains, nevertheless, that "the chromatosome, *i.e.*, the aggregate assemblage of pigment granules does *expand* and *contract* in the same sense that a volume of gas expands and contracts," and he concludes: "If the words, as I have used them, are misapplied, it is likewise incorrect to speak of the expansion and contraction of the mercury in a thermometer or of the air in a tire-pump."

It does not seem to me that this contention is sound, for expansion in a gas is the result of the action of the molecules of which the gas is composed and it involves increase in volume, whereas the distribution of the granules in a chromatophore is due to action in the wall which surrounds the cavity containing the granules, not to action of the granules or the fluid in which they are suspended, and there is no increase in the volume of the granules or the fluid in which they are suspended.

If (in a system consisting of a rubber tube connected with a rubber bulb filled with granules suspended in a fluid) pressure were brought to bear on the bulb so as to force the granules out into the tube, I do not believe it would generally be said that the mass of fluid and granules in that system has expanded. Nor do I believe that if mercury were forced out of the bulb of a thermometer into the capillary, owing to contraction of the glass wall of the bulb, it would generally be said the mercury has expanded. I consequently see no reason why one should say the mass of granules in a chromatophore expands if some of the granules are forced out into the branches, owing to contraction in the heavy wall which surrounds the cavity in which they are found.

I therefore answer in the negative Sumner's question, "Is it not just as accurate to say that urethane, for example, causes the chromatosomes [in the chromatophores] to expand as to say that this drug causes the pigment particles in the chromatophores to spread out?" And if the two clauses in this question are made equally explicit (by adding the content of the brackets) the second clause is practically as simple as the first; and it has moreover the advantage of avoiding the addition of a new term to scientific literature, which is already overburdened with terms. This clause is however not ideal as it stands, for it may imply action on the part of the granules. It would be more explicit, I think, to say the drug causes spreading or better distribution of the granules. The language used should describe the changes in the position of the pigment granules in the chromatophores without implying changes in the volume of the granules, either individually or as a mass, and without implying action on the part of the granules.

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[1] SCIENCE, September 29, 1933.
[2] SCIENCE, November 10, 1933.
[3] SCIENCE, January 5, 1934.

ADVANCING GLACIERS IN ALASKA

I AM interested to read in your "Items" column in the *Science Supplement* of January 26 that the only advancing glacier in Alaska to-day is the Taku.

I have led three expeditions into Alaska in 1930, 1932 and 1933 and devoted much of my time personally to the study of the existing glaciers in the Lituya Bay and Yakutat districts. Of the five glaciers which we have measured over this period of time at Lituya Bay and Crillon Lake, *all but one* are advancing at a rate of two feet per week or higher. This advance is so rapid in one case that the glacier has over-ridden its older lateral moraines and is at present plowing its way into a forest outside of its former limits, indicating that to-day this glacier (the South Crillon Glacier) is at its greatest extent, both lateral and longitudinal, in fifty years or more.

The earthquake advance theory formulated by Tarr and Martin in their "Alaskan Glacier Studies," pub-