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.

S. O. MAST

THE JOHNS HOPKINS UNIVERSITY

[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-

lished by the National Geographic Society, may well be the cause of these advances, but the glaciers of this part of Alaska have not been studied in sufficient detail since the Tarr-Martin expedition for any definite conclusions to be drawn at the present time. It may be of interest to note that the Nunatak Glacier whose ice-front was surveyed by Tarr and Martin in 1909 has receded nearly *five miles* since that time, as shown by our aerial photographs of 1933. I hope that during the next two years we shall be able to execute a more accurate aerial survey of the glaciers at Yakutat to determine their relative motion to the old figures of 1909. The Hidden Glacier has receded at least two miles since that time, while the Turner, Haenke and Hubbard glaciers seem to show little change. Perhaps the most curious discovery of our 1933 expedition was one which we made at Crillon Lake in the Fairweather Range, where two glaciers terminate only a mile or so from each other. The first I have mentioned above as advancing rapidly into the forest outside of its old channel. The second has *retreated* at least one hundred yards in the last three years.

Alaska is a marvelous field for the study of glacial ice in motion, and it is surprising that so few parties have been able to make computations there in recent years.

H. B. WASHBURN, JR.

CAMBRIDGE, MASS.

GERMAN PERIODICALS AND AMERICAN LIBRARIES

SCIENTISTS and librarians have been disturbed for the last several years by the steadily increasing prices charged for scientific books and periodicals, particularly German publications in the biological and medical fields. The production costs and the prices of scientific periodicals have been increasing; library budgets as well as the income of professional classes who are subscribers to scientific periodicals have been decreasing. The attempt of German publishers to compensate for a decrease in the list of subscribers by an increase in subscription prices showed signs of failure even before the present depression started. The difficulties confronting both publishers and librarians were disclosed at various conferences of German publishers in Europe and at a joint conference held in Chicago in October between representatives of the German Börsenverein der Deutschen Buchhändler and librarians of many countries. A summary of the events leading to the present tentative understanding between librarians and German publishers may interest all who are concerned with the availability of reports of scientific research.

Complaints of the increasingly high prices charged for German scientific periodicals were published as early as 1928 in *Svenska Dagbladet* and the English periodical, *Nature,* later during 1931–1933 in SCIENCE, the *Journal of Higher Education* and other scientific periodicals of various countries, as well as in nearly all library journals. Protests were also made by scientific and medical associations both in this country and abroad. The basic complaint was the high price, which in the case of some periodicals was in excess of $200 a year. A further difficulty was due to the fact that many German publishers issued their periodicals irregularly (Zwanglose Hefte), charging for each number separately. Libraries found it impossible to ascertain the annual subscription price of any given periodical and to prepare a library budget at all accurate. The Börsenverein recognized the justice of these complaints as far back as 1931. Dr. Friedrich Oldenbourg,[1] the president of the Börsenverein, showed that the foreign market for German scientific publications, which was lost during the war, had been won back rapidly, but might be lost again. Dr. Oldenbourg was in almost exact agreement with the foreign critics. He earnestly advised a restriction in the extent of German scientific articles. However, the high prices showed no decrease and the complaints of scientific and library organizations continued with even greater vigor until by the summer of 1933 it became apparent that the American market for German scientific periodicals was in immediate danger of being almost completely lost.[2]

A meeting of representatives of German authors, publishers and librarians was held at Münster, on August 3, 1933. At the conclusion of the conference announcement was made that all members of the Börsenverein would be expected in the future to state subscription prices in advance; that a reduction of at least 20 per cent. in the content and price of the inflated (aufgeblähte) periodicals would be expected. This agreement met warm appreciation. However, some of the German publishers apparently believed that their high-priced periodicals were not inflated. A list of periodical prices issued in September indicated that the expectation of a 20 per cent. reduction would not be realized.

Immediate protests were made to the Börsenverein. Possibly as a result the Börsenverein decided to send two representatives to the international conference of the American Library Association in Chicago. The

[1] *Börsenblatt,* 98: 325–31, April 9, 1931.

[2] It should be noted that German authors, scientists and librarians almost universally recognized the justice of the complaints. *Cp.* article by Professor Dr. Hubert Naendrup, Rektor der Westf. Wilhelms-Universität, in *Mitteilungen des Verbandes der Deutschen Hochschulen,* 13: 114–35, October, 1933, and articles by Dr. Georg Leyh, of the University of Tübingen, in *Zentralblatt für Bibliothekswesen,* 50: 377–88, May, 1933, and 51: 81–97, January, 1934.