sary if we are to save the trees in this country." The Federal Government has made available $400,000 of Civic Works Administration funds with which to attack the disease up to May 1 next. Additional or other funds will be required after that. Governor Lehman urges that for the next two or three years, "or for such period as is necessary to determine the feasibility of eradication, the Federal Government continue to supply all funds necessary to adequately prosecute the complete eradication program."

DISCUSSION

WHAT ARE "EXPANSION" AND "CONTRACTION"?

IN a recent issue of SCIENCE (November 10, 1933), Dr. Mast takes exception to the terminology which I have proposed (September 29, 1933) to designate the movements of the pigment masses in the chromatophores of vertebrates and their changes in shape and apparent size. I proposed the terms "chromatosome," "melanosome," etc., for those pigment masses, and contended that the terms "expansion" and "contraction" be applied to these contained masses, rather than to the chromatophores themselves, to which many writers continue inconsistently to apply them.

Mast's account of the movements of the pigment granules back and forth along definite paths will hardly be disputed, at least for certain cases in which these phenomena have been carefully followed. We may also accept as probable his assertion that the source of the movement lies in the colorless cytoplasm, rather than in the granules themselves. His further reasoning, however, is difficult to follow. "While it is evident," he writes, "that the pigment masses (chromatosomes) change enormously in form, there is no evidence indicating that they *per se* change in size, *i.e.*, expand and contract, and that the change is due to processes within them." Again, "Under the conditions which induce movement of the pigment granules out into the branches of the chromatophores they become distributed through a relatively large space, and under those which induce movement in the opposite direction they become concentrated in a relatively small space."

I fail to see why Mast's account of what happens to the pigment granules in a chromatophore would not apply in its essentials to a volume of gas, subjected to variations in temperature or pressure. Here the molecules "become distributed through a relatively large space," or "become concentrated in a relatively small space," as the case may be. Yet no one hesitates to say that the volume of gas "expands" and "contracts." The same is true of liquids or solids, though within a much narrower range.

The fact that the pigment granules are suspended in hyaline protoplasm, and that this is (probably) responsible for their migrations, should not affect the issue. 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. To say that the component particles "spread out" or "aggregate" is no more true in one case than in the other. But it is often convenient to avoid such circumlocutions, and to speak directly of what happens to the assemblage of particles. Is it not just as accurate to say that urethane, for example, causes "the chromatosomes to expand" as to say that this drug causes "the pigment particles in the chromatophores to spread out"? And is it not much simpler?

I can not, therefore, agree with Mast's contention "that the phrase 'expansion and contraction of these masses' (chromatosomes) describes the phenomena in question but little, if any, more accurately than the phrase 'expansion and contraction of chromatophores.'" 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.

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CONVENTIONS OF BOTANICAL NOMENCLATURE

A RECENT article by Dr. R. W. Brown[1] is provoking in more senses than one; the sober admonition that "the botanists should now without hesitation follow the wise leadership of the zoologists" in a matter of nomenclature may well provoke the petty rage of *Fachleute;* it will provoke not only rage, but also attempts to answer and reflections on the nature of botanical nomenclature.

The field of systematic botany is cultivated by men of all nations; the fruit of their labor is intended for the use of all men, and all men are free to propose improvements in methods of cultivation. Dr. Brown urges at least four improvements: (1) The adoption of a standard system of pronunciation of scientific names; (2) the elimination of case-endings from personal names in specific epithets; (3) a new rule in codes compelling authors of names to supply the etymology; and (4) the decapitalization of all specific epithets.

Specific answers are to be derived from general principles. The names of plants are not code-designations arbitrarily established and subject to tinkering; they are words of a language, subject to the rules

[1] SCIENCE, 78: 333–335, 1933.