when the gas is burning. From the reduction in the load and the diameter of the bell the effective flame pressure can be obtained. My values are rough, but for the two cases shown in the above table they turn out to be about 0.18 mm of mercury and 0.37 mm of mercury. These are of the same order of magnitude as the values given by Professor Barus.

The question as to whether the effect is due entirely to the increased viscosity of the heated gas, or whether a true flame pressure has also something to do with it, is not easily answered. The observations reported by Professor Barus seem to indicate that the viscosity is important. A rough analysis of various factors which are involved suggests that for a given orifice the added pressure caused by the increased viscosity would be roughly proportional to the rate of efflux, and that a true flame pressure would also be roughly proportional to the rate of efflux. In the two cases cited above the ratio of the added pressures which were observed is 2.1, whereas the ratio of the rates of efflux is 1.7. These numbers differ sufficiently to suggest that perhaps neither factor alone is sufficient to explain the pressure but that both may be operative, that the added pressure may perhaps be due in part to the increased viscosity and also in part to a true flame pressure.

ARTHUR TABER JONES

SMITH COLLEGE

TO TEACHERS OF LABORATORY GENETICS

ASIDE from the now ubiquitous Drosophila, suitable material for laboratory work in genetics is not abundant. Occasionally in our research laboratories, forms are secured which are favorable for use in illustrating one or another fundamental genetical principle, and such material should be brought to the attention of teachers and made available for general use in teaching laboratories.

Cases in which dominance is definitely absent, giving rise to the monohybrid ratio 1 : 2 : 1, are relatively rare, and the classical examples of the Blue Andalusian fowl and the pink-flowered Mirabilis are not suitable for laboratory use.

Since the occurrence of dominance introduces a complicating factor in the analysis of hybrid progenies because it masks genotypic differences, destroying the parallel between the phenotype and the genotype, the 1 : 2 : 1 ratio gives a simpler approach to the typical Mendelian behavior than does the 3 : 1 ratio of the much more common case in which dominance is complete or nearly complete.

In my extensive studies of shepherd's purse (*Bursa bursa-pastoris*), I have found the usual prevalence of complete dominance, but in 1917 a peculiar form which has been designated *tenuiloba,* originated as a segregate in the F_2 of a cross between two wild strains of shepherd's-purse, derived, respectively, from Korea and from Landau, Germany, which has bred true when selfed, and which gives 1 : 2 : 1 ratios of *tenuiloba, heteris* and *rhomboidea* when crossed with a pure *rhomboidea.* The *tenuiloba* and *rhomboidea* segregates breed true and the *heteris* splits again as in the F_2. The *tenuiloba* form has the median lobes of the climax leaves of the rosettes reduced to slender bristles which diverge at a small angle from the rachis of the leaf, while the *heteris* in these families has the slender primary lobes diverging nearly at right angles to the rachis and each associated with a conspicuous secondary lobe. *Rhomboidea* has less conspicuous secondary lobing on an unelongated primary lobe.

As the three forms are very distinct, no difficulty is experienced in their accurate separation. This fact, together with the ease with which Bursa cultures are successfully handled, and the fact that the definitive stage in these forms occurs in the rosettes, thus making it possible to classify the segregates within a few weeks after the plants are transplanted from the seed-pan into three-inch pots, makes it entirely feasible to use this material in laboratory courses limited to a single semester.

To teachers who wish to diversify their laboratory work in genetics by the introduction of these forms, I am prepared to supply packets of selfed seeds of heterozygotes in such numbers as are likely to be called for. A smaller number of parcels of selfed seeds of the homozygous types is also available for those who wish to have at hand pure-bred families of these types, but as the *tenuiloba* and *rhomboidea* forms in the segregating families are pure homozygotes, it will not be *necessary* to have pure families in order to provide for the assured presence of homozygous material of the grandparental types.

No compensation is asked for this material except that the results of segregation found by students in each of the segregating families should be reported back to me, in order to contribute to a determination as to whether the slight deviations from the 1:2:1 ratio fall within limits which indicate that such deviations may be appropriately attributed to errors of random sampling.

Because of the presence of wild Bursa seeds in all ordinary soils, it is necessary in the handling of Bursa cultures to sow the seeds in sterilized soil. I make it a rule to grow 125 plants of each family in which a monohybrid ratio is expected. Greenhouse space of about one square meter must be provided, therefore, for each culture grown. The continuation of cultures for the use of subsequent classes will be very easily provided for by growing to maturity the requisite number of *heteris* plants (heterozygotes)

and placing a paper bag of suitable size over the inflorescence of each when ready to begin flowering, as the plants self-fertilize perfectly when thus treated.

In order to share in this distribution of material, applications should be made promptly, stating the number of parcels which the applicant is prepared to grow.

GEO. H. SHULL

PRINCETON, NEW JERSEY

THE PRESENT STATUS OF THE METRIC SYSTEM

IN SCIENCE, September 5, 1924, Professor Satterly, of the University of Toronto, takes exception to any plea for extended use of the metric system. His concluding argument is: "The trouble with men like Mr. McAdie is that because they like a thing they think all the world must agree with them." The professor doubtless means that some men when they have a good thing like to share it; and for the implied compliment we return thanks, although not sure we deserve such unstinted praise—and in public, too.

"I have been teaching physics in Toronto for the last twelve years and have introduced (*sic*) the English units more and more," says Professor Satterly. If his students are submissive, certainly others should not object. May the progress continue until the table of linear measurement beginning "three barley corns make an inch" is reached. Clean, dry, medium-sized corns, laid end to end. Later it can be determined how many corns make a yard, a rod, a rood, a perch, a pole or a chain.

The professor also prefers pounds, shillings and pence to the decimal money in use in Canada. He asks, "And how is it that the quarter is so popular?" The profound truth is—it is easier to get than a dollar; but if given a choice between accepting a quarter or a dollar, I know which one I'll take; and I fancy Professor John will do the same.

ALEXANDER MCADIE

BLUE HILL OBSERVATORY

HAVING been an interested reader of the various recent comments regarding the present status of the metric system as printed in SCIENCE, one or two additional observations may aid in clarifying the situation.

In the first place, why does not such a highly organized scientific group as that of the United States Weather Bureau discard the Fahrenheit thermometer with its freezing point 32 degrees above a zero which has no scientific meaning at the present time? A step in the right direction was shown in the weather map of the northern hemisphere prepared by the Weather Bureau during the early months of 1914 and suddenly discontinued on August 2 of that year when the warring nations of Europe stopped sending in the necessary data. Why not resume the publication of these maps and then adopt the same temperature scale or the common Celsius scale for the United States maps also?

Professor McAdie's arguments in SCIENCE for June 13 will be accepted without dispute by scientific workers. However, it should be borne in mind that the "cooks" and "carpenters" use the system taught them in the public schools and that very little attention is given to the metric system in the arithmetic classes of the common schools. This is due partly to the fact that a very large percentage of the teachers are not sufficiently familiar with that system to teach it effectively and in a larger degree it is neglected because neither teachers nor school supervisors have ever been convinced of its practicability and adaptability to everyday affairs. The metric system will never be generally adopted until the masses of the people are convinced of its practical value. The masses can most easily be reached through the rising generation in the common schools. The teachers can most easily be "sold" to the system if we can convince them that its use would save about a year's time in compound numbers in arithmetic. Men like Professor McAdie, who know the working advantages of the metric measures from constant daily use, have a real responsibility in bringing the matter to the attention of grade teachers, taking advantage of every opportunity that presents itself in normal schools, teachers' institutes and teachers' associations.

J. C. JENSEN

NEBRASKA WESLEYAN UNIVERSITY,
UNIVERSITY PLACE, NEBRASKA

GERMAN BIOLOGICAL PUBLICATIONS

THE claim is made that the price of German biological publications is no higher than many American and not so high as the English. May I ask SCIENCE to publish data that show the average cost per page of this library's most recent subscriptions to serial publications issued in four countries?

Country	Average Cost per page	No. Journals in estimate
America, U. S.	$.010	27
England	.0111 +	17
France	.006	8
Germany	.016 +	29

PRISCILLA B. MONTGOMERY

LIBRARY OF THE MARINE BIOLOGICAL LABORATORY,
WOOD'S HOLE, MASS.

THE PAN-PACIFIC RESEARCH INSTITUTE

A STATEMENT in SCIENCE for August 29, page 195, quoted from the press, to the effect that I "have tentatively accepted the directorship of the Pan-Pacific