AT the University of Kansas Dr. Dinsmore Alter, formerly associate professor of astronomy, has been appointed professor of astronomy in the department of physics and astronomy. He spent the past academic year in study and research in the California Institute of Technology while on leave of absence from the University of Kansas.

PROFESSOR WILLIAM J. MILLER has resigned as head of the department of geology in Smith College to become professor of geology and chairman of the department in the University of California, Southern Branch, Los Angeles.

DR. SHEPHERD IVORY FRANZ has resigned his positions at St. Elizabeths Hospital and George Washington University and will be associated with the department of psychology of the University of California, Southern Branch, Los Angeles.

AT the University of South Carolina Dr. Laurence L. Smith has been appointed associate professor of geology and Mr. Fred R. Neumann instructor in geology.

DR. GEORGE N. BAUER has been appointed associate professor of mathematics at the University of New Hampshire.

DR. H. W. RICKETT, instructor in botany at the University of Wisconsin, has been appointed assistant professor of botany at the University of Missouri.

AT a recent meeting of the Board of Regents of the University of Nebraska, the following appointments to the College of Medicine were confirmed: Dr. Harold Gifford, professor of ophthalmology, emeritus; Dr. James M. Patton, professor of ophthalmology and chairman of department; Dr. O. M. Cope, assistant professor of physiology and pharmacology; Dr. Herman F. Johnson, clinical assistant in orthopedic surgery; Dr. A. R. Knode, secretary of the department of laryngology; Dr. Chas. F. Moon, instructor of obstetrics and gynecology; Dr. A. E. Bennett, clinical assistant in neurology; Dr. M. Grodinsky, clinical assistant in surgery; Dr. Walter Benthack, fellow in pathology. The regents also created the department of clinical investigation and Dr. Arthur D. Dunn was appointed professor and chairman of this department.

SIR GILBERT WALKER has been appointed professor of meteorology at the Imperial College of Science, England, in succession to Sir Napier Shaw.

DR. WILHELM STEPP, professor of internal medicine at the University of Giessen, who is doing research work at Baltimore, has been appointed professor at the University of Jena following the resignation of Professor Stintzings.

DISCUSSION AND CORRESPONDENCE

THE PRESSURE CAUSED BY A FLAME

PROFESSOR CARL BARUS[1] has recently described observations of what he at first took to be a pressure caused by the burning of the gas in an open flame, but which he now thinks is probably due to the increased viscosity of the heated gas near the point where it escapes from the orifice into the flame. This effect is one which I ran across a number of years ago,[2] and which at that time I attributed to a real pressure exerted by the flame.

My method was entirely different from that used by Professor Barus. I was feeding a small flame with gas from a small gasometer, and I noticed that when the flame was extinguished the gasometer bell fell more rapidly than when the flame was burning. The effect was the same as if the movement of the burning gas away from the point where it burned gave rise to a pressure.

Since Professor Barus's note appeared I have looked again for this effect, and in a couple of cases have examined roughly the magnitude of the effective back pressure. The gas was ordinary illuminating gas, and the nozzle at which the flame burned was a piece of glass tubing about 6 mm in inside diameter, drawn down at one end until the opening through which the gas escaped had a diameter of a little less than a millimeter. A number of readings of the height of the gasometer bell, taken while it was falling, showed that its rate of fall was nearly linear. The difference between the rate of fall when the flame is burning and when it is not burning may be surprisingly large. The following table shows the difference for two cases. It will be seen that when the gas was not burning the bell of the gasometer fell in the first case half again as fast as when the gas was burning. That is, in some way the burning slowed down the fall of the gasometer, as if the movement of the burning gas away from the point where it burned produced a pressure.

Condition	Rate of Fall, mm/sec. Case 1	Case 2
Burning	0.084	0.140
Not Burning	0.126	0.189
Burning Again	0.082	0.141

To get some idea as to the magnitude of this apparent pressure it is only necessary to reduce the load on the bell of the gasometer until the rate of fall when the gas is not burning equals the rate observed

[1] SCIENCE, 60, p. 137, August 8, 1924.

[2] Acoustic Repulsion of Jets of Gas, p. 29, Clark University Dissertation, 1913.

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)