occurrence of a 3:1 ratio when a 1:1 would be expected, and the appearance of dominants in the offspring of recessives. To explain these peculiarities the hypothesis is offered that the plants possess a double set of factors along with the double series of chromosomes. Further experiments are required to confirm this inherently probable hypothesis. It may be pointed out that the cases of duplicate factors for a single character, such as the red glumes in the wheat of Nilsson-Ehle, may be due to a similar mutation or germinal change having occurred independently in two or more chromosomes belonging to different pairs. Gates.

Hus, H. The origin of × Capsella bursa-pastoris arachnoidea. Amer. Nat. **48**: 193—235, Apr. 1914.

In cultures of *Capsella bursa-pastoris* derived from plants growing spontaneously in the greenhouse, the author was able to distinguish the reviewer's two forms, *C. bp. rhomboidea* and *C. bp. simplex*, as well as several types not previously described. The most striking of the latter forms was one with enlarged cotyledons, very narrow, unlobed, strap-shaped leaves, short flower-stems, and almost completely sterile flowers. This form he names *C. bp. arachnoidea*. Because of its sterility the author was unable to test directly the genotypic constitution of this striking new type, but by well directed experiments with collateral forms he was able to produce the same type again, and to show that it is homozygous with respect to a gene *N* which decreases the relative width of the leaves. When *N* is absent, as in *rhomboidea* and *simplex*, the earlier leaves are about twice as long as broad; when *N* is present once, i. e. heterozygous, the early leaves are 2·5 to 3 times as long as broad, and when homozygous the leaves are strap-shaped. Only in the latter case is the fertility also affected. The gene *N* may also be defined as a counteractor of the *rhomboidea*-gene, *B*. When *N* is heterozygous the action of *B* is only partially inhibited, but the inhibition is complete when *N* is homozygous. The author was usually able to distinguish the heterozygous forms. He describes these in detail, assigning to them trinomials as follows:

bbNn = *C. bp. attenuata*
BbNn = *C. bp. Setchelliana*
BBNn = *C. bp. Treleaseana*

The author also finds heterozygous *rhomboidea* (*Bbnn*) frequently distinguishable from the corresponding homozygous form, as the reviewer has also found, but to this heterozygote he gives no name. The desirability of giving trinomial names to heterozygous biotypes may well be questioned, especially in material so easily modifiable by slight variations in the environment. The author confesses that he is frequently unable to classify these forms except by a study of their offspring. The genotypic formulae seem to be the most satisfactory designation for such forms. The results of the genetic experiments leave no doubt of the essential correctness of the author's analysis, but the manner in which a general deficiency in the number of *arachnoidea* individuals is explained, is a confession of an avoidable weakness in technique that the author should improve; unintentional selections from the seed-pan may be effectively guarded against if appropriate methods are adopted to that end. The author points out that covering the inflorescence is unnecessary in genetic experiments with Capsella, but this process is so easily carried out with this species that one is not justified in taking the risk of an occasional unintentional cross. The reviewer has frequently found

natural hybrids of Capsella and the parent of the author's first specimens of *C. bp. arachnoidea* was such a natural hybrid, showing that unguarded specimens of Capsella are occasionally cross-fertilized.

The author describes another new form of *C. bursa-pastoris* in which the early leaves are nearly orbicular, the whole plant being very robust and with large flowers, though not so large as in *C. bp. grandiflora*. This form he calls *C. bp. orbicularis*. Its genetic behavior has not been fully studied. The author accepts Heribert-Nilsson's interpretation of the mutation-phenomena in the Oenotheras (a point of view with which the reviewer can not agree) and while not willing to make so sweeping a statement as Heribert-Nilsson has made regarding the nature of mutations, concludes that the majority of putative mutants are the result of Mendelian segregations and new combinations. G. H. Shull.

Relander, L. Einige Beobachtungen über die Produktionsfähigkeit und die Blütezeit der F_1-Generation einiger Erbsenkreuzungen (Arbeiten aus der landw. Zentralversuchsstation in Finnland Nr. 1, 1914, 26 Seiten, 8 Tafeln).

Eine aus der grünen Viktoriaerbse gewonnene Linie wurde mit Linien anderer Erbsen bastardiert und F_1 studiert. Da die betrachteten Eigenschaften sehr von den äußeren Verhältnissen abhängig sind, wurde F_1 mit den P in Topfversuchen verglichen. Studiert wurde Produktionsfähigkeit und Blütezeit. Die Produktionsfähigkeit, welche durch Erntemasse im ganzen, an Samen und an Stroh, durch Tausendkorngewicht und durch Mittel hülsentragender Internodien und Hülsen, je pro Individuum, sowie Mittel an Samen und Samenanlagen pro Hülse festgestellt wurde, ergab bei diesen Eigenschaften meist das bei quantitativen Eigenschaften überwiegend beobachtete, intermediäre Verhalten, daneben aber auch Überschreitungen der Mittelbildung gegen Dominanz der höheren Produktivität, aber selbst Überschreitungen der Produktivität eines jeden Elters. Der Verf. ist nicht geneigt, letztere Erscheinung als Wirkung der Heterozygotie aufzufassen, sondern als solche verschiedener Anlagen-Vereinigungen. — Bei Blütezeit wurden für bestimmte Zeitabschnitte, bezogen auf die Gesamtzahl Blüten, Prozent Knospen, Blüten und Hülsen, je für Elter und F_1, in Topfkulturen bestimmt und graphisch dargestellt. Jene Bastardierungen, bei welchen die Blütezeiten der P einander nahe standen, zeigten gegenüber den P Verspätung, beziehungsweise Verfrühung der Blütezeit, jene, bei welchen die Blütezeiten der P weiter auseinanderlagen, Mittelstellung der F_1. Den ersten, bei Blütezeit von den Befunden v. Tschermaks abweichenden Befund möchte Verf. durch die Annahme der Einwirkung anderer Eigenschaften auf die Eigenschaft Blütezeit erklären. Höhere Produktion in F_1 würde so z. B. auf Verspätung der Blütezeit wirken. Fruwirth.

Shull, G. H. Über die Vererbung der Blattfarbe bei Melandrium. (Ber. d. Deutsch. bot. Gesellschaft, 31. Generalversammlungsheft, pp. 40—80, 1914.)

Baur hat bei *Melandrium* und anderen Pflanzen nachgewiesen, daß es einen Grundfaktor (Z) für Chlorophyllbildung gibt. Dies bestätigt Verf. vollkommen. Nach Baur sind nun alle zz-Pflanzen farblos; Z ohne die übrigen