

Analysis of the leucin fractions of casein and edestin gave the following results, those obtained by Abderhalden being given for comparison. The figures represent yield in grams from 100 grams of protein.

	Casein.		Edestin.	
	V-S. and L.	Abderhalden.	V-S. and L.	Abderhalden.
Leucin,	7.84	10.5	8.1	20.9
Isoleucin,	1.51			
Valin,	6.69	10	5.6	0.45
Total "leucin fraction,"	16.04	11.5	13.7	21.35

Our figures are based on analytically pure products. It is evident that Abderhalden missed from 80 to 90 per cent. of the valin which was undoubtedly calculated in with the leucin, as the two are not separable by the methods previously available. Still other products in the necessarily crude mixture may account for the high yield from edestin.

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"Clavin," Vahlen's active principle of ergot.

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In a recent paper Vahlen¹ describes the isolation of the two constituents of clavin, a crystalline substance isolated by him from ergot. By means of their copper salts two substances, leucin and "clavin base" of the formula $C_5H_{11}O_2N$, were separated from the clavin. From analysis of clavin it appeared to consist of leucin and clavin base in molecular proportions, and was regarded as a salt-like combination, similar to that in which some alkaloid bases are found, the leucin acting as acid, the clavin base as base. Vahlen regards clavin as the active principle of ergot in stimulating contraction of the uterus, and the clavin base as the active constituent of clavin.

From the description of clavin, it appeared similar in both physical and chemical properties to the mixture of leucin and valin obtained from proteins. A sample of Vahlen's clavin was obtained from Merck and submitted to the process devised for determination of leucin, isoleucin, and valin in the presence of one another.² The

¹ *Arch. f. exper. Path. u. Pharm.*, 1909, lx, 42.

² Levene and Van Slyke: These Proceedings, 1909, vi, 54.

clavin, which when purified free from ash had the properties described by Vahlen, consisted entirely of these three amino acids, the latter being isolated analytically pure: 2.02 grams of clavin gave 0.79 gram of leucin, 0.45 gram isoleucin, 0.75 gram valin. We have not yet determined whether any of these amino acids has the pharmacological effect assigned to clavin.

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Some effects of sodium benzoate.

By **DANIEL R. LUCAS.** (By invitation.)

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This research was suggested to me by different experiences with sodium benzoate when taken by mouth in the following ways: A. Pure (1) as crystalline salt, or (2) in aqueous solution. B. In neutral or alkaline solutions, or in mixtures rich in fat, carbohydrate or protein, *e. g.*, milk. C. With vegetable or fruit acids (1) hot, as in tomato soup, or (2) cold, as in canned plums, oranges, lemons, etc. D. In beverages containing high percentages of organic acids, *e. g.*, cider, lemonade, grape juice, wine, etc. E. In mixtures containing inorganic acids, *e. g.*, artificial gastric juice.

Brunton has studied the effects of benzoic acid on enzymes and bacteria. The strong inhibiting effect of this substance on their activity is in striking contrast to the slight effect of sodium benzoate. Doepner has shown that fairly large quantities of sodium benzoate (2 per cent.) did not prevent the development of *Proteus vulgaris* and, in strengths equal to 0.5 per cent., only slightly retarded the development of *B. enteritidis*, *B. fluorescens* and *B. coli*. Fleck found that benzoic acid in concentrations equal to 0.6–0.7 per cent. caused marked inhibition of yeast fermentation and that the inhibiting action was markedly decreased by the amount of protein present. Lehman observed that meat extract putrefies in the presence of 1 to 2 per cent. of sodium benzoate, but less benzoic acid acts more strongly antiputrefactive when the reaction of the medium is markedly acid. The action of sodium benzoate under markedly acid conditions is the same as the action of benzoic acid. Under such conditions the action of the benzoate diminishes with decrease of