

Mutants should be selected whose loci are properly spaced—not so close together that the error of random sampling is excessive, nor so far apart that double crossing over occurs between them. (3) When the amount of double crossing over between two distant loci is accurately known, data involving them can be used by making the appropriate correction. (4) The data must be obtained under uniform conditions, special attention being paid to the age of the parents, constancy and suitability of temperature, and to freedom from genetic modifiers of crossing over. (5) Any experiment involving more than two loci should figure only once in the calculation of each particular region of the chromosome. (6) Data for each region should be adequate in amount as judged by the laws of probability. (7) If slightly different positions are indicated by two or more independent experiments, then a mean position should be calculated in accordance with the amount and value of the different sets of data. (8) The framework of the map having been constructed on the basis of the most significant loci, each remaining locus is interpolated as accurately as the amount and reliability of data permit.

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**Effect of position of body on the length of systole and diastole
and rate of pulse in man.**

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There is need of a practical method of determining the condition of the heart muscle in man. The contraction period of other muscles is lengthened if they are fatigued or degenerated, and this may be true of heart muscle. An accurate determination of the length of systole might be of use, provided its normal relationship to the heart rate and the ordinary variations were known.

At the Minneapolis meeting of the American Physiological Society December 28, 1917, the writers reported that they had studied the length of systole and diastole in man, by recording the carotid pulse and measuring the systole from the beginning of

the upstroke to the dicrotic notch. The subjects were 20 normal men, and 1,600 cycles were measured. A curve in which the average duration of systole and of diastole were plotted in relation to pulse gave a striking picture of the shortening of systole and diastole by increasing heart rate.

The great variation in the length of systole and diastole which may occur within a single minute was emphasized. Both are affected by respiration, and diastole, at least, by vaso-motor influences.

It can now be definitely stated that the changes in the length of the systole and the diastole observed in succeeding cycles have no constant relation to each other, and therefore are probably brought about in different ways.

The special object of this communication is to attract attention to the great difference in the average length of systoles and diastoles caused by a change in the position of the human body. It has been found that, in sitting the systoles average by pulse rates from 50-95.9 per cent. longer than in standing, and in lying down 17 per cent. longer than in standing. The diastoles are also lengthened, but only to about one half as much as the systoles.

The change in the length of the systoles caused by change of position of body, although of course influenced markedly by the pulse rate, is not due to the pulse rate alone, for the systole may be lengthened when the pulse rate has undergone no change, or when it is changed, the percentage change in systole may be much greater than that of the pulse rate.

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The extraction of "fat-soluble vitamine" from green foods.

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We have recently published experimental data to demonstrate the occurrence of "fat-soluble vitamine" in certain foods.¹ McCollum, Simmonds and Pitz² have stated that "ether extraction

¹ Osborne and Mendel, *J. Biol. Chem.*, 1919, XXXVII, 187.

² McCollum, Simmonds and Pitz, *Am. J. Physiol.*, 1916, XLI, 363.