

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS
DEPARTMENT.

Your Editor is pleased to offer to the College Section the following paper by Professor Walter Crosby Eells, a well-known and authoritative writer on the center of population of various phases of education. All of us expected the center of population of pharmaceutical education to move westward as more colleges of pharmacy were established west of the Alleghenies, but I doubt that any of us expected the sharp reversal as indicated in the past decade.

In Professor Eells' contribution there is food for thought for every executive and teacher of Pharmacy.—C. B. JORDAN, *Editor*.

THE CENTER OF POPULATION OF PHARMACEUTICAL EDUCATION, 1870-1930.

BY WALTER CROSBY EELLS.*

The *center of population* is defined by the United States Census Bureau as "the point upon which the United States would balance, if it were a rigid plane without weight and the population distributed thereon, each individual being assumed to have equal weight and to exert an influence on the central point proportional to his distance from the point." In other words it is the center of gravity of the weighted plane or a two-dimensional average of the population.

The determination of this point at the regular decennial census intervals is the best method that has been devised by the Census Bureau to trace compactly the rate and direction of general movements of the population. The first official computation of this point was made under the direction of Francis A. Walker, superintendent of the ninth census, for publication in the first statistical atlas of the United States published in 1874.¹ At that time the position of the center of population was computed for each census year since 1790.

So convinced has the Census Bureau become of the value of this mode of summarizing population trends that in later years it has made much more extensive use of the same method. In 1910 the positions of the center of population since 1880 for each state were computed. In 1920 the method was further extended to include centers of foreign-born population, of Negro population, of urban and rural population, and even to determine centers of agriculture, of manufacturing, of number of farms, of farm area, of improved acreage, of value of farm property, and of the production of corn, wheat, cotton and oats.²

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¹ Walker, Francis A. (Compiler), "Statistical Atlas of the United States, Based on the Results of the Ninth Census." Washington, 1874, page 5. For an earlier unofficial computation and other information regarding history of the center of population see Eells, Walter Crosby, "The Center of Population—a Prophecy and Its Fulfilment," in *The Scientific Monthly*, 20, 78-84, January 1925.

² Sloane, Charles S. (Compiler), "Center of Population and Median Lines and Centers of Area, Agriculture, Manufactures and Cotton." (Fourteenth Census of the United States, 1920.) Washington, 1923, pages 12-41.

Why not then educational centers of population as well? A method which has proved so valuable in summarizing movements of general population should be equally valuable in studying the movements of the higher educational population—the student enrollment in the colleges, universities and professional schools of the United States.¹ The object of this paper is to report and discuss the results of computations which have been made by the author to determine the *center of population of pharmaceutical education* for each census year from 1870 to 1930.

METHOD OF COMPUTATION.

The data upon which the computations are based were taken from the official reports of the United States Office (formerly Bureau) of Education.² These statistics are not perfect, but they probably are as accurate and reliable as are available. The method used was the same as that of the Census Bureau, with the substitution of "states" (with their centers of population as computed by the Census Bureau) for "square degrees" as the unit of computation.³ The number of students of pharmacy involved for each census year is as follows:

1870	440
1880	1,347
1890	2,871
1900	4,042
1910	6,226
1920	5,026
1930	10,906

It is noteworthy, although not directly pertinent to this study to observe that the reported number of students of pharmacy more than doubled between 1920 and 1930.

LOCATION OF CENTERS.

The latitude and longitude and approximate location of the center of pharmaceutical education for the seven different decennial years, 1870–1930, are shown in Table I and on the map of Fig. 1. The map also shows the location of the general

¹ For two such studies, see Walter Crosby Eells, "The Center of Population of Higher Education," *School and Society*, 24, 339–344 (September 11, 1926); and "The Center of Population of Engineering Education, 1900–1930," *Journal of Engineering Education*, 25, 662–669 (June 1935).

² Reports of the Commissioner of Education: 1870, page 524; 1880, page 154; 1889–1890, page 1023; 1899–1900, 2, page 1973; 1910, 2, page 1034; Biennial Survey of Education, 1918–1920 (*Bulletin*, 1923, No. 29), page 294; Biennial Survey of Education, 1928–1930 (*Bulletin*, 1931, No. 20), pages 349–350.

³ "In making the computations for the location of the center of population it is necessary to assume that the center is at a certain point. Through this point a parallel and a meridian are drawn, crossing the entire country. . . . The product of the population of a given area by its distance from the assumed parallel is called a north or south moment, and the product of the population of the area by its distance from the assumed meridian is called an east or west moment. In calculating north and south moments the distances are measured in minutes of arc; in calculating east and west moments it is necessary to use miles on account of the unequal length of the degrees and minutes in different latitudes. The population of the country is grouped by square degrees—that is, by areas included between consecutive parallels and meridians—as they are convenient units with which to work."—SLOANE, CHARLES S., *loc. cit.*, page 5.

center of population of the country for the same dates. The abbreviation "C. S." in Table I indicates that the town named is the county seat of the county in which the given center is located.

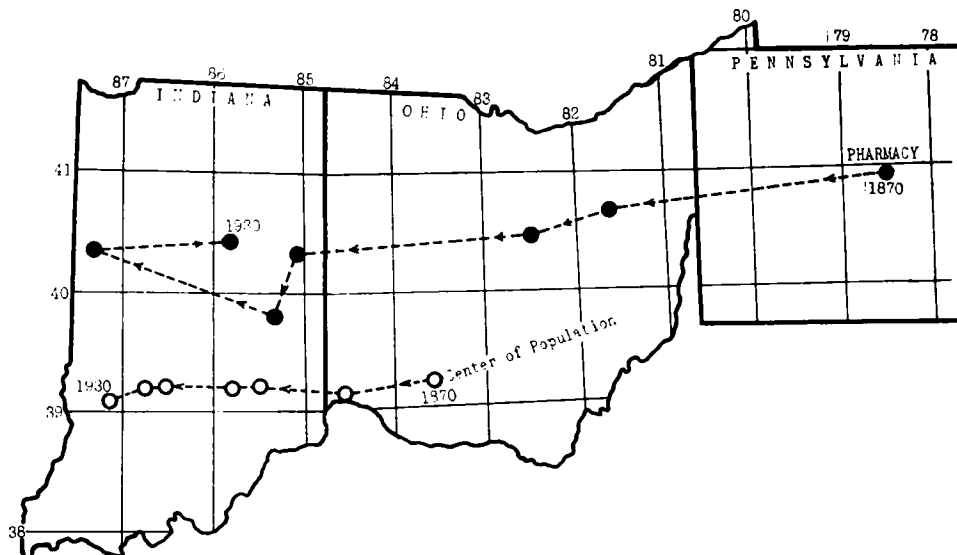


Fig. 1.—Movement of centers of population of pharmaceutical education and of the general population, 1870-1930.

TABLE I.—LOCATION OF CENTERS OF POPULATION OF PHARMACEUTICAL EDUCATION, 1870-1930

Year.	Latitude North.	Longitude West.	State.	County.	Distance from Important Cities and Towns.
1870	40° 56'	78° 33'	Penna.	Clearfield	84 miles N.E. of Pittsburgh 8 miles S.W. of Clearfield, C. S.
1880	40 39	81 39	Ohio	Holmes	31 miles S. of Akron 15 miles N.E. of Millersburg, C. S.
1890	40 24	82 30	Ohio	Knox	39 miles N.E. of Columbus 1 mile N.W. of Mt. Vernon, C. S.
1900	40 21	85 02	Indiana	Jay	22 miles N.E. of Muncie 6 miles S.W. of Portland, C. S.
1910	39 50	85 20	Indiana	Henry	23 miles S. of Muncie 7 miles S.E. of Newcastle, C. S.
1920	40 21	87 20	Indiana	Warren	58 miles N. of Terre Haute 4 miles N.W. of Williamsport, C. S.
1930	40 25	85 49	Indiana	Grant	48 miles N.E. of Indianapolis 12 miles S.W. of Marion, C. S.

The most outstanding fact shown is the rapid shift westward during the half century from 1870 to 1920 of the center of population of pharmaceutical education—a total of 463 miles in only fifty years. This movement carried it from a point in Western Pennsylvania across Ohio and Indiana almost to the Illinois line. It is surprising to note, however, the sharp reversal of a half century's trend in its sudden movement eastward from 1920 to 1930 of 80 miles back into the eastern part of Indiana. The trend has been steadily southward for the first forty years, but in the past two decades it has shifted northward again although still more than 30 miles south of its 1870 position. The movement of the center of population for education in pharmacy, in miles for each decade, is summarized in Table II.

TABLE II.—MOVEMENT OF CENTER OF POPULATION OF PHARMACEUTICAL EDUCATION, 1870-1930.

(In Miles during the Preceding Decade.)

Year.	From Point to Point in a Straight Line.	Northward.	Southward.	Eastward.	Westward.
1880	162.9	..	16.7	..	162.0
1890	47.1	..	14.7	..	44.8
1900	133.5	..	3.2	..	133.5
1910	35.0	..	31.2	..	15.9
1920	110.6	31.2	106.1
1930	80.0	3.9	..	79.9	...
Totals (net)			30.7		382.4

Reference to the map of Fig. 1, shows that the center of population of pharmaceutical education has always been north and with one exception (1920) has also always been east of the center of general population for corresponding years. While the center of general population has moved westward only 190 miles in six decades, the center of pharmaceutical education shifted westward 462 miles in the first five decades. Even if the 80-mile eastward shift of the last decade be taken into account, the 1930 position is more than twice as far from its 1870 position as was the case for the general population. Westward the Course of Empire has taken its way, but far more rapidly for students of pharmacy than for the general population. The north and south distance between the two centers, which was 120 miles in 1870, had decreased to 93 miles in 1930. Relative to the distribution of the general population, there always has been a much greater emphasis on education in pharmacy in the North than in the South, and except in 1920 in the East than in the West. Viewed as a whole, however, the East has lost much of its earlier primacy in the field of pharmaceutical education.

What the situation will be in 1940 is problematical. The general center of population will doubtless be at or near the Indiana-Illinois line. Whether the pharmaceutical center will continue eastward, or will reverse itself again and continue its general westward trend is an open question. It seems doubtful, however, whether it will move entirely out of Indiana by 1940.

Such facts as are presented in this paper, summarizing long time trends, may furnish food for thought and speculation on the part of those responsible for the education of the pharmacists of the future.

MEDICAL MILE-STONES.

"The Medicine Man of the American Indian and His Cultural Background" is the rather lengthy but arresting title of a recent study by Dr. William Thomas Corlett, professor emeritus after long service on the Faculty of Medicine of Western Reserve University. The Indian tribes included in the study inhabit or have inhabited the lands from the Arctic Circle

to Terra del Fuego and from the Atlantic to the Pacific Oceans. Although some of the information in the volume has been acquired by the author through first-hand contacts, much of it is the result of careful study and research into records, histories and other documents. A valuable bibliography covers eighteen pages and includes publications in six languages dated from 1510 to 1934.—From *Medical Milestones*, September 4th.