case of diffusion is called *osmosis*. The difference in diffusion pressures is therefore called *osmotic pressure*, since it is the cause of osmosis in the same way that diffusion pressure is the cause of diffusion.

Furthermore, if there is pure water on one side of the membrane, the osmotic pressure is a function or property of the aqueous solution on the other side. In this sense such a solution has an osmotic pressure wherever it is, the value of which is controlled by temperature, external pressure and the concentration of solutes.

In the case of a living plant cell and its osmotic relations, there is such a variation in the pressure of the cell wall against the cell contents that the osmotic pressure of the cell as a whole may be much less than that of the cell contents which is proportional to the concentration of solutes when the cell sap is freed from the wall pressure. The wall pressure increases the diffusion pressure of the water within the cell and thus reduces the osmotic pressure of the cell contents to that extent. The osmotic pressure of the cell contents and therefore of the cell as a whole will always be equal to the theoretical pressure (based on concentration of solutes) minus the wall pressure. Since this is the net effect of the solutes in the cell contents, the effective osmotic pressure of a cell at any moment can be called its *net osmotic pressure*. The relationship between it (N), the wall pressure (W) and the theoretical osmotic pressure of the cell contents based on solute concentration (C) is expressed by the equation $N = C - W$. Suitable modification of this equation is necessary when the cell is in contact with a tissue or a solution with an effective osmotic pressure of its own, the effect being to lower the net osmotic pressure of the cell to that extent.

Since plant tissues are characterized in general by variations in solute concentration and in turgor or wall pressures, the concept of net osmotic pressure of the cells is very useful and practical. It can often be measured directly and the measurement used in computations of either wall pressure or solute concentration if one of these is also known. To elementary students it gives the picture of balanced physical forces in living cells. Suction tension is its equivalent in value, but it has no logical connection as a scientific term.

As a statement of the same physical condition, the expression "diffusion pressure deficit" has its merits, but in actual use it is an unwieldy, negative term that makes an unnecessary reference back through the osmotic pressure idea to the basic concept of diffusion. Students find it very difficult to manage. Even by those who prefer it for some purposes, it is seldom used to express the osmotic property of a solution, probably because it actually refers to the solvent and not to the solution. Osmotic pressure is an established term for solutions and cell contents, with a natural appeal to both biologists and physical chemists. If it can be used with suitable qualifying words to describe some of the complex osmotic relations of living cells, it should be employed in the interests of uniformity among the sciences. Surely it should not be abandoned by physiologists just because it has been abused by some through lack of understanding.

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THE DEMAND FOR SCIENCE BOOKS

THE publication of books on science and technology has shown a steady increase in the United States for the last decade according to statistics compiled by the Bureau of the Census.

The year 1939 thus far marks the peak of production for publishers of books on scientific and technological subjects with a total of 3,432,642 volumes. Figures for that year are the latest available, since the Census of Manufactures, covering production in all American industries, is taken only biennially. The next Census, to be conducted in 1942, will cover 1941 production.

The 1939 total represents an increase of more than a million volumes over the 1937 total of books on science and technology, 2,380,351 volumes.

Separate statistics on production of books on science and technology have been compiled by the Census Bureau biennially since 1925. They are: 1935—1,937,084; 1933—1,611,642; 1931—1,818,585; 1929—2,294,660; 1927—2,392,044; 1925—2,094,343.

The Bible, however, is still America's best seller, as is indicated by the number of Biblical volumes published. Figures covering 1939 show the annual output of Bibles, Testaments and parts of the Bible published in separate covers, to be 7,927,848 volumes, compared with 5,579,317 in 1937. Both 1937 and 1939 recorded tremendous increases in total number of Bibles printed. For earlier census years Bibles published were: 1935—591,173; 1933—666,448, and 1931—1,376,680.

The number of complete Bibles published in 1939 was 2,348,069. Testaments published separately numbered 1,268,614. Parts of the Bible (not whole Testaments) numbered 3,361,234 volumes, while an additional 969,931 Biblical volumes were not classified by text.

While the production of Bibles showed an immense increase, the publication of fiction recorded a heavy decline, 13,511,181 volumes in 1939, compared with 25,454,135 volumes in 1937.

The total number of all books published in 1939 was 180,142,492 volumes, compared with 197,359,076 volumes in 1937; 140,651,953 volumes in 1935; 110,789,913 volumes in 1933; 154,461,622 volumes in 1931, and 214,334,423 volumes in 1929.

The largest single grouping reported was that of text-books for school use, not distributed as to subject-matter, which amounted to 63,274,758 volumes in 1939, compared with 72,771,685 volumes in 1937.

Next high in 1939 in total numbers were books for juvenile readers, 34,848,416 volumes, compared with 29,336,530 volumes in 1937.

Statistics on other books, by class and number, for 1939 and 1937, are given in Table 1.

TABLE 1

Kind	1939	1937
Agriculture and related subjects	1,018,809	1,034,607
Biography	2,384,647	2,754,390
Fine arts	590,885	694,163
History	2,306,829	1,238,806
Law	2,356,395	2,448,165
Medicine	1,868,892	3,923,532
Music (musical notations)	5,682,042	6,722,598
Poetry and drama	1,499,477	1,788,541
Religion and philosophy	6,413,606	6,944,102
Sociology and economics	886,751	1,156,885
Travel and geography	1,482,138	1,641,931
Reference	6,716,403	3,841,442
Miscellaneous	16,196,422	23,367,371
Bluebooks, directories, catalogues, etc.	7,724,351	4,280,525

Publication of pamphlets more than doubled in number, with a 1939 total of 540,536,202, compared with 216,847,761 in 1937.

Maps, atlases and globe covers published in 1939 numbered 64,309,275, compared with 103,867,467 in 1937.

A. W. VON STRUVE

BUREAU OF THE CENSUS

PRESERVATION OF THE CONTINUITY OF THE SCIENTIFIC RECORD

UPON us in the more fortunate continents where research in pure science can still go on there surely rests an obligation to do all we can in aid of our colleagues abroad. The exigencies of the immediate situation are sufficiently clear, but it is now none too early to plan for aid in the restoration of pure science abroad after the war.

Specifically, foreign subscriptions to American scientific journals have fallen off. This means that the continuity of files in foreign libraries may be broken, irretrievably unless the situation is planned for now, and much that is being accomplished by American scientists and by Europeans working in America will be unavailable to the scientists abroad who return after the war to their depleted laboratories and impoverished libraries. Are the publishers and editorial boards of American journals setting aside enough extra copies of their current numbers so that the broken files abroad may be made complete after the war?

Each scientist in this country must know of colleagues abroad with common interests. Are we each buying enough extra reprints of current articles to supply at a more propitious time those abroad who work in our fields? By clear thinking and decisive action on these and related questions much might be done to restore the free culture of science which is now so hard pressed in much of the world.

STUART MUDD

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SCIENTIFIC BOOKS

RECENT BOOKS IN GEOGRAPHY

AT a time when wide-spread military conquest and a series of international crises have once again focused attention on geography, it is significant to note the appearance of five books in that field between August and December, 1940. Four are revisions of earlier texts, but the fifth is a completely new work.

As a popular treatise of the subject by a professional geographer, Roderick Peattie's "Geography in Human Destiny" (323 pages and 26 illustrations. New York: George W. Stewart. 1940. $3.50) should prove of special interest to those who have had only a grade-school or high-school acquaintance with formal geography.

After introductory chapters on the nature and content of his field, Professor Peattie proceeds to trace the environmental thread in human activity from the Paleolithic Age to the present moment, or, as he regretfully suggests, from "stone ax to dive bomber." He develops his philosophy in a direct and simple, if not highly polished style, and enriches the discussion with frequent citations from broad personal experience and the pens of others. The volume is concluded by comments on the geographic basis of national conservation and a brief treatment of the author's concept of "The Geography of Peace." An interesting feature is the list of further readings of a popular nature which appears at the end.

While some geographers may shrink from its rather strongly environmentalistic tone, and others may doubt the appropriateness of the chapter on evolution, the fundamental soundness of "Geography in Human Destiny" is beyond question. Total lack of pictorial illustration is the greatest shortcoming of the book. Although it contains twenty-six well-executed maps, charts and physiographic diagrams by Arthur Robinson, the many opportunities for clinching arguments or making points more effective through the use of well-selected photographs have been ignored by either the author or the publisher.

Principles of Human Geography. By ELLSWORTH HUNTINGTON. Fifth edition. 594+xxiv pp. 70 maps, 26 diagrams, 2 plates and numerous tables