sity of Cincinnati, has been appointed gas officer in the Medical Division of the Office of Civilian Defense, Washington, D. C.

RICHARD F. FLINT, associate professor of geology at Yale University, an authority on glaciation, has leave of absence to accept a commission as a major in the Army Air Corps. He has been given an assignment concerned with the Arctic area with the Proving Ground Command of the Army Air Forces. His previous experience included work as senior scientist on the Byrd Expedition to Greenland in 1937, where he studied the glaciers and submarine connections between the Spitzbergen Islands and Greenland and journeyed within six hundred miles of the North Pole.

DR. HAMILTON SOUTHWORTH, assistant in medicine in the College of Physicians and Surgeons, Columbia University, has joined the staff of the Medical Division of the Office of Civilian Defense as a member of the Scientific Development and Research Section. Dr. Southworth will go to London shortly to represent the Medical Division as an intelligence officer. He has been commissioned in the U. S. Public Health Service in the grade of surgeon.

DR. FRANK E. EGLER, director of the Chicle Development Company Experiment Station and assistant professor on leave from the New York State College of Forestry, has been made senior dendrologist in the U. S. Forest Service, a war service appointment on the recently established Latin American Forest Resources Survey. He may be reached at the American Legation, San Jose, Costa Rica.

LLEWELYN WILLIAMS is leader of an expedition to make a survey in Peru in search of new supplies of cinchona bark.

DR. EUGENE L. OPIE, director of the department of pathology, Cornell University Medical College, New York, will deliver the second Edwin R. Kretschmer Memorial Lecture of the Institute of Medicine of Chicago on February 26. His subject will be "The Experimental Production of Leukemia and Its Significance in Relation to the Human Disease."

DR. WILLIAM J. ROBBINS, director of the New York Botanical Garden, will deliver the fifth Harvey Society lecture of the current series at the New York Academy of Medicine on February 18. Dr. Robbins will speak on "Some Internal Factors Limiting Growth."

LIEUTENANT COLONEL PAUL F. RUSSELL, U. S. Army, chief of the Tropical Disease and Malaria Control Section of the Division of Preventive Medicine, Office of the Surgeon General, Washington, D. C., will deliver the annual Hermann M. Biggs Memorial Lecture on April 1 at the New York Academy of Medicine. His subject will be "Malaria and Its Influence on World Health."

DR. ROBERT CUSHMAN MURPHY, of the American Museum of Natural History, gave on January 20 the Schiff Foundation Lecture at Cornell University, Ithaca. With the aid of kodachrome motion picture films, the speaker discussed the marine investigations of the Diesel schooner *Askoy* in the Pacific west of Colombia, during the first half of 1941, and also described many aspects of geographic and historic interest along the little known Chocó coast between southern Panama and northwestern Ecuador.

THE *Journal* of the American Medical Association reports that the Academia Nacional de Medicina of Buenos Aires has established the Hirsch Medical Scholarships with a fund of 500,000 pesos (about $125,000) given by Alfredo Hirsch of Buenos Aires. The work of these scholars will be carried out in the United States or in England for two years beginning by the middle of 1943. For the first ten years the scholarships will be given for studies on cancer, leprosy or infantile paralysis.

DISCUSSION

FURTHER COMPUTATIONS IN CHEMICAL PROGRESS

THE curve of chemical progress, based on the abstracts in *Chemical Abstracts,* and first published in SCIENCE for February 14, 1936, when prolonged to bring it up to date, shows important changes in slope. These changes in slope seem to indicate a close tying up of peaceful living with progress.

The full curve, shown in Fig. 1, like the curve published in 1936, is based wholly on the number of journal articles on chemistry indexed each year by the editors of *Chemical Abstracts.* Thus a little less than 8,000 journal articles were indexed in 1907, about 2,000 more the next year, and so on until 1913, when a little over 19,000 were indexed. Then the number dropped at a somewhat faster rate until 1918.

In 1919 the curve resumed its upward course at the old rate of a 2,000 increase each year, continuing, with two breaks which must be noted and explained, until a peak of almost 46,000 was reached in 1938, more than five times the rate of progress in 1907.

The curve turned completely in 1938 and plunged downward until it reached 31,000 (estimated in part) for 1942.

In other words, the present war has wiped out the growth of chemical progress during the last eight years, setting chemistry almost back to the year 1929.

Under the headline "Pure Science Held up by War," the *New York Sun,* October 21, 1942, explained how the Smithsonian Institution has turned away from its path of peaceful days when it "devoted itself to the furthering of fundamental knowledge, much of which has had little practical significance at the moment, but which has produced a secure foundation for practical development."

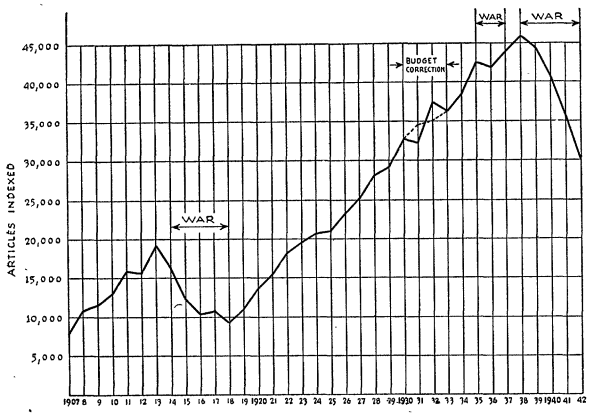

FIG. 1

During the war this work "must be temporarily suspended," and the staff of almost 100 scientists has been coordinated for the work of answering scientific inquiries sent in by the military, drawing the answers from "accumulated knowledge." Thus there have been no research results to publish from the Smithsonian Institution, to take it as one example of the effect of war on scientific progress.

The apparent drop at the year 1931 is apparent only. The budget makers mistakenly assumed that the financial depression, beginning in 1929, would begin to show in diminishing journal articles by 1931, and therefore they restricted the budget of the *Chemical Abstracts* editors in that year.

No such diminishing of journal articles appeared and 2,500 journal articles were held over from 1930 for indexing until 1931. The dotted line crossing 1930 makes this correction for the 2,500 held over so that the curve becomes practically straight until it drops slightly in 1936, the year Italy conquered Ethiopia.

Apparently the threatening war clouds of that year, 1936, adversely affected chemical progress nearly as much as the war clouds affected it in 1939.

One added phenomenon seems worth mentioning, and that is the parallelism between chemical progress and mechanical progress. The ratio of chemical patents to mechanical patents issued in the United States has not altered greatly in many years. For the last year, with wide fluctuations, the issue of chemical patents has averaged about 10 per cent. of all patents issued, as against 7 to 8 per cent. in the thirty years preceding 1936. The obvious inference is that war affects mechanical and chemical progress alike, and now seems to be adversely affecting mechanical progress a little more severely than it affects chemical progress.

To those who set up the theory that wartime progress is kept secret for some years and is published later the answer is that no such phenomenon can be deduced from the curve following the year 1919. The oft-repeated statement that war helps progress is true only in a few very narrow fields where industry learns to turn to hitherto unused sources of information, such as Smithsonian Institution, and profits by that information.

For the most part, research organizations, in wartime, are weakened or the experts are put on inspection work or are set to work in unfamiliar fields, so that less progress becomes possible.

JOURNAL ARTICLES ABSTRACTED ANNUALLY IN CHEMICAL ABSTRACTS

Year	Numbers of Abstracts	Year	Numbers of Abstracts
1907	7,975	1925	20,951
1908	10,835	1926	23,103
1909	11,455	1927	25,037
1910	13,006	1928	28,153
1911	15,892	1929	29,083
1912	15,740	1930	32,731
1913	19,025	1931	32,278
1914	16,468	1932	37,403
1915	12,290	1933	36,139
1916	10,519	1934	38,371
1917	10,921	1935	42,593
1918	9,283	1936	41,927
1919	10,957	1937	44,032
1920	13,619	1938	45,917
1921	15,211	1939	44,414
1922	18,070	1940	40,624
1923	19,507	1941	35,588
1924	20,523	1942	30,479

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SYNCHRONY IN FLOCK WHEELING

THE problem of the synchronization of action of cells and organisms has long attracted the interest of biologists. Separate units often respond with such simultaneity or under such other conditions that, in the case of neurones, ordinary conducted nerve impulses seem to be excluded.[1,2,3] Similarly with the behavior of organisms—insect flashes,[4] plant blooming, fish wheeling, and the like.[1,5]

[1] R. W. Gerard, *Scientific Monthly,* 44: 48–56, 1937.
[2] R. W. Gerard, *Ohio Jour. Science,* 41: 160–172, 1941.
[3] R. W. Gerard, *Annual Review of Physiology,* 4: 329–358, 1942.
[4] R. Ruedeman, SCIENCE, 86: 222–3, 1937. G. Alexander, SCIENCE, 82: 440–1, 1935. H. A. Allard, SCIENCE, 82: 517, 1935.