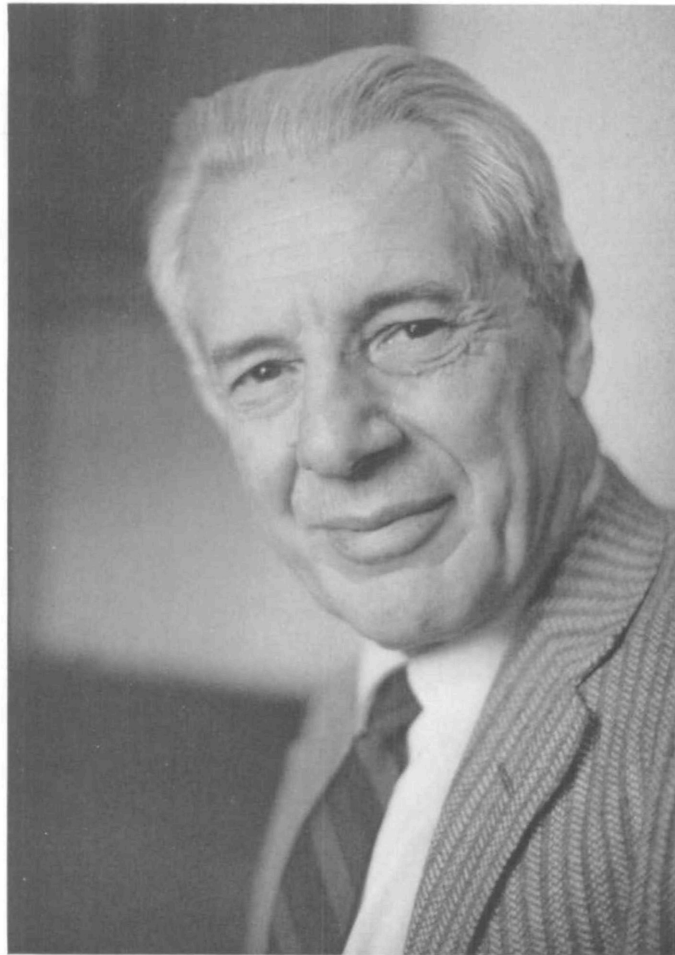


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# INVESTIGATIVE OPHTHALMOLOGY

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Zacharias Dische

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On the presentation of the Proctor Medal of the  
Association for Research in Ophthalmology  
to  
Zacharias Dische

In 1947, we in the Eye Research Laboratory at Columbia became aware of a new arrival at P and S, a quick-moving, intent professor with a shock of iron-gray hair. A little later we learned that he was Dr. Zacharias Dische, lately of France and Vienna, and was to be our colleague in charge of biochemistry in the Eye Research Laboratory. Very soon we realized that we had among us a most remarkable man. Our admiration of Dische began immediately and, occasionally coupled with amazement, has continued to grow ever since. He is regarded by all of us as the Dean of ophthalmic biochemistry. This is a bit of his history.

Professor Dische, after early years in Poland, began his career as an investigator via military service in 1917. Army life during the World War I catastrophe was turned at least to some advantage by young Dische. It is characteristic of him to find all subjects of interest and susceptible to scientific investigation. As a military man he undertook a study of supernumerary mammary glands presented by the recruits of the Austro-Hungarian Army. The results of this research constituted his first publication, but alas, it appeared under the authorship of his commanding officer! The benefits derived by Dische from this work were restricted to relief from more onerous military duties, access to all libraries available to the Central Powers, and an acquisition of a thorough knowledge of histology.

Although he had obviously served Austria valorously in her armed forces, he was denied, after the war, the right to take the medical school examination on the grounds that he was a citizen of Poland. A year was required to solve this dilemma, which was accomplished, significantly, by the intervention of an ophthalmologist, Dr. Landau, with the Dean of the University of Vienna. Zacharias, upon completion of the examination, received his M.D. degree in 1921 and entered the laboratory of Professor Otto Furth, where he began the series of studies on color reactions for which he is so justly renowned. In 1931 he succeeded Dr. Furth as chief of the biochemistry laboratory in the Institute of Physiology of the University of Vienna, a position he held until 1938. During this time, he devoted himself to the study of intermediary metabolism of blood cells, discovering the now famous pentose-shunt reaction, which has but recently been found to play an important role in the metabolism of ocular tissues.

In 1938, together with many able citizens, Dr. Dische left Vienna. He arrived in France, armed with a transit visa for Portugal, to which he traveled so deliberately that two years later he was still in France. At that time, he wished to present a paper at the International Congress of Physiologists and Biochemists at Zurich. A place on the program for his paper was refused at the request of the German government. This predicament was resolved

by the resourceful Dische by delivery, to Professor Knoop of Tübingen, of a promise that he would not return to Austria or Germany in exchange for permission to deliver his paper. This bargain, fortunately for us, prevented his return to Vienna after World War II.

In the early days of the occupation of France, Dische was, as a foreigner, under the control of the French military, specifically of a branch also charged with counterespionage. Although, according to public radio information, such an action would become, by the terms of the Armistice, strictly illegal, he obtained an "ordre de marche" from his commanding officer. This provided him with freedom of movement and required that the French military furnish him with food, housing, and transportation while on a mission of seeking officials of the Centre de la Transfusion Sanguine, Hôpital St. Antoine (his former employer), in Paris, for the purpose of securing his back paycheck. In this he failed, but in Marseille he made contact with Professor Meyerhof, who introduced him to the Dean of the university on whose request a general "ordered" Dische to report for work in the biochemistry department of the University of Marseille. During the period there one of Dische's most fundamental pieces of work was accomplished, in which was demonstrated a "feed-back mechanism" and the concept of the control of enzyme processes. This important discovery was lost to science for a time because of its publication in a little-known, poorly distributed wartime publication. Recognition of this work, however, has not escaped the attention of biochemists currently working in this new rapidly developing field. The original contribution of Dische has been singled out by Jacques Monod, Hans Krebs, and others as the initial work in this area. The time spent on this project at Marseille was also a period of waiting for a United States visa which eventually arrived and allowed him to come here, first to Mt. Sinai Hospital and then to Columbia University in the De-

partment of Biochemistry and, to our personal joy, finally, in 1948, to the Department of Ophthalmology.

When considering the position as biochemist in ophthalmology, he proposed a series of investigations beginning with a study of sulfhydryl groups in the lens. He threw himself into the study of ocular tissue with characteristic enthusiasm and confidence, knowing that he would uncover intriguing problems of importance to ophthalmology and of even greater significance to biology and medicine generally. It became his purpose to develop the eye as a biochemical model, and in this he has succeeded. His studies have taken him deeply into the chemical organization of the cornea, the vitreous, and the lens. His earlier experiments fitted well with these new adventures, because all of his ocular work is based on the concept of the eye as a part of the body as a whole rather than as an exotic structure unrelated to other structures and functions. His studies clarified the organization of the vitreous and cornea at a level far beyond the reach of the electron microscope, showing the relationship of structural carbohydrates and proteins, which is an important factor in their pathology and function. The synthesis and degradation of lens proteins in growth, senescence, and in cataracts have absorbed his attention. The elastic capsule of the lens was so carefully analyzed and interpreted in the light of basic biology that it can now be regarded as a model of basement membranes: a contribution of ophthalmic biochemistry to medicine in general. Perhaps of the greatest importance, really, is the attainment of his original purpose, the demonstration of the scope of ocular biochemistry, and the significance it can have to all of medicine and biology.

Any time, anywhere, the friends of Dische gather, everyone is his friend, stories are told of him, many hilarious, all to his credit, and each a tribute to human qualities which we all admire. The many anecdotes together characterize him, a

feat impossible to accomplish in a few sedate words. A glimpse of his desk suggests that he is disorganized; the desk may be, but he is not. He is extraordinarily economical of his time and energies. He distinguishes sharply between things that are essential and those that are not. All of us know of his extraordinary knowledge of scientific literature, but we cannot discover when the enormous amount of reading this requires is done. One answer is that he reads far more rapidly than most, and retains infinitely more than we ordinary men. He is vigorous and youthful. I suspect this is due, in part, to his intense interest in so many things. He is widely read in areas of science far removed from his own field and his interests extend far beyond science. One may ask Zacharias (and learn!) of the latest adventures of Dick Tracy, the state of the stock market, and current scandal, political or social. When America became absorbed in dancing the twist, many professors doubtless commented on the craze with little knowledge of the subject. Dische, however, spent an entire evening in research at the Peppermint Lounge with no other purpose, he said, than to become well informed. He

has a system by which he keeps up with world affairs. Each day when the afternoon editions arrive, Zacharias goes to the newsstand and, with papers under his arm, enters our cafeteria which is magically changed into a Viennese coffee house. Shortly, he hurries back to his laboratory, demanding data and reports from a staff whose thoughts at this time are mainly on their journey home.

A series of catastrophes, worldwide in extent, have been the background of the life of Zacharias Dische. Each has been met characteristically and skillfully as well as ingeniously. The difficult years have been weathered and even turned to advantage by him. It has been our good fortune that these events brought him to the United States and to Columbia University. It has been advantageous for biology generally that his creative genius has always found, by his own efforts, a means to express itself. It is our own personal pleasure that for the past seventeen years and for years to come he has been, and will continue to be, in the Eye Institute among colleagues who hold him first in respect and affection.

*George K. Smelser*