K. Henke, Developmental Biologist

The untimely death of Karl Henke, professor of zoology at the University of Göttingen, on 14 September 1956, deprives the field of developmental science of one of its most original minds and German zoology of one of its most successful research workers and teachers.

Karl Henke was born in Bremen on 3 October 1895. He studied zoology in Göttingen and obtained his Ph.D. degree in 1923. He remained at the Zoological Institute in Göttingen until 1933, working with Alfred Kühn. In 1928–29 he was awarded a Rockefeller fellowship, which he used for work at Yale University in Harrison's laboratory. After returning to Germany, he became a *Privat-dozent* at Göttingen in 1929. In 1933 he accepted a position at the Kaiser Wilhelm Institute in Dahlem. In 1937 he was called to Göttingen as professor of zoology and director of the Zoological Institute, a position he held for the remainder of his life.

Henke's scientific work centered around the problem of the development of color patterns in animals, which he took as a model for the more general developmental problem of pattern formation. He brought to bear on the problem a large number of different techniques and the power of integration of his imaginative and disciplined mind. Together with Kühn he started out with the genetic and developmental analysis of the wing pattern of the meal moth *Ephestia,* which led to the recognition of the existence of systems of pattern elements which form a unit insofar as they vary concomitantly under the influence of genetic and environmental influences. This concept was followed up by means of operative techniques which culminated in his fundamental work on the pattern determination on the wing imaginal disc of *Philosamia cynthia,* carried out at Yale. The same concept forms the basis of his monumental monograph on the variation of the wing pattern in the Saturniidae, in which he used the method of comparative morphology, not for the derivation of phylogenetic relations, but for the elucidation of the developmental mechanisms involved in pattern formation and in the integration of different pattern elements. The information obtained in these studies led to the recognition of developmental processes leading to the formation of fields and field boundaries in a previously uniform structure. This principle was extended, in a series of papers, to the color pattern formation in organisms other than Lepidoptera.

The second period of Henke's work centered around the problem of the determination of patterns at the cellular level. It was demonstrated that in the *Ephestia* wing the determination of scale, socket, and an abortive sensory cell is the result of two unequal cell divisions. In the further pursuit of this finding Henke succeeded in demonstrating that the determination of primordial scale cells, as opposed to primordial epidermal cells, is in turn the result of a series of differential cell divisions. Recognition of different degrees of polyploidy in the different types of scale cells and of the numerical relations between scales and epidermis cells on the wing led him to a theory called the "compensation principle," suggesting that the number of possible mitoses is firmly determined for the primary stem cell, and that in successive mitoses this limited potentiality is differentially distributed to the daughter cells. Always cautious in his interpretations, he was engaged at the time of his death in collecting further evidence pertaining to this process.

Henke's scientific work is characterized by great care in the collecting of facts and caution in their evaluation. In choosing his problems, in the way he attacked them, and in the integration of his conclusions, he showed a highly imaginative way of thinking and a very independent and versatile mind. In this way, he has succeeded in leaving behind a well-founded basis of theory and fact which sheds light on one of the more perplexing aspects of development.

Henke's influence has been great, not only through his scientific work, but also through the impact of his personality on his colleagues, friends, and students. His manner combined modesty and reserve with a warm sense of humor and genuine wit. Many of his short statements will be remembered by his friends. The range of his interests was wide and encompassed philosophy as well as the arts. As a teacher he was highly stimulating and able to transmit his own high standards of scientific work to his students. Because of his complete integrity and his genuine kindness in human relations, he enjoyed the confidence of his colleagues and of his numerous friends.

As a result of this, he was called in his later years more and more into administrative tasks, which he fulfilled with his characteristic conscientiousness without regard to his own health. After World War II he had the task of rebuilding the Zoological Institute of Göttingen, which had burned. He served as dean of the faculty of sciences in Göttingen in 1955–56, was chairman of the biology panel of the Deutsche Forschungsgemeinschaft, and a member of the Akademie der Wissenschaften in Göttingen. Developmental biology has lost in him one of its most creative scientific minds, and German biology, one of its most trusted leaders.

ERNST CASPARI
Wesleyan University,
Middletown, Connecticut