

## First chronicler of chronobiology

### *An obituary of Erwin Bünning*

Erwin Bünning was born in Hamburg on 23 January 1906 as the son of the teacher Heinrich Bünning. He remained in Hamburg for his school studies (1912–1925) and is known to have read extensively even during this early stage. He studied biology, chemistry, physics and philosophy at the universities of Göttingen and Berlin from October 1925 to July 1928 and obtained his DPhil degree from Berlin University in 1929.

He worked first as lecturer in Frankfurt University, University of Utrecht and in Königsberg University (now in the Soviet Union) and later as reader (Dozent) at the University of Strasbourg. He became a full professor at the end of the Second World War in 1945 at the University of Cologne and accepted the Wilhelm Pfeffer Chair for plant physiology at the University of Tübingen in 1946, where he stayed for the rest of his life.

Bünning had all the character traits of the classical German Ordinarius Professor of his times, complete with the reputation of not being easily accessible. This image was further fortified by his being a man of few words and one who truly believed that 'anything worth saying can also be said briefly'. His own statements and writings were characterized by true economy of words. He was prophetic about several recent developments in research and teaching in biology. He was the prime mover in the matter of the famous institutes for botany and zoology at the University of Tübingen merging into their present form of the Institut für Biologie I, II & III. He preferred to be called a biologist rather than a botanist. In this and other matters he was greatly influenced by the life and work of Wilhelm Pfeffer (1845–1920). Bünning has written an eminently engaging biography of his role model Pfeffer.

The Nazis, after harassing him in universities, forced him to become a soldier in 1939. In his own words, 'My

interest in this profession becomes clear from the fact that I never reached the rank of an officer.' But this unfortunate war record was remembered by some, possibly also by the Nobel Prize Committee, all his life. But his colleagues and scientists the world over always acknowledged Erwin Bünning as a great man. He was invited by colleagues for longer visits even in 1948 to Sweden and to England. In the years following he responded to invitations from the UK, the USA, Canada, France, the Netherlands, Switzerland, Australia, Japan, Pakistan and India



Bünning published about 260 papers in various fields of plant physiology and general biology, wrote the first monograph on the subject of biological rhythms, gave the first detailed account of the history of chronobiology in the form of 'The Chairman's Address' at the first Cold Spring Harbor Symposium on Biological Clocks (1960) and a well-known textbook on plant physiology. In 1981 the US National Academy of Sciences asked him about 'discoveries you consider most important'. His answer is a model of the humility that is a characteristic of all truly great scien-

tists. He wrote: 'Experiments from 1929 to 1935 proving that certain biological 24-hour rhythms in plants and animals are endogenous and inherited. Also proving that, under constant conditions, the periods of these rhythms are not exactly, but only about, 24 hours [therefore now called *circadian* rhythms]. I made during that time also the first cross-breeding experiments with strains of different periods. During these years and later on, I demonstrated that these rhythms have adaptive values, for example for measuring the length of days [photoperiodism].' Bünning's entirely original idea that 'circadian rhythms act as yardsticks' in measuring seasons was first spelled out in his paper of 1936. This paper ('Bünning E Die endogene Tagesrhythmik als Grundlage der photoperiodischen Reaktion', *Ber. Deut. Bot. Ges.*, 1936, 54, 590–607) became a citation classic of *Current Contents* in 1982 and the idea conveyed in it is today known as Bünning's hypothesis. Bünning never alluded to this as Bünning's hypothesis in conversation, print or in his monograph. After his retirement in 1971 the universities of Glasgow (1974), Freiburg (1977), Erlangen (1977) and Göttingen (1986) honoured him with doctorates *honoris causa*. He is fellow of seven academies including the US National Academy of Sciences (foreign associate). He was elected honorary fellow of the Indian Academy of Sciences in 1986, which he considered was to him 'a great honour and pleasure'.

Even though he was a 'northerner' he dearly loved Tübingen, the Swabian town of the philosophers and the muses on the banks of the tranquil Neckar. He died three days after contracting pneumonia in Tübingen on 4 October 1990. He leaves behind his wife Eleanore, two daughters and a son to mourn his loss.

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