

# BIOGRAPHICAL MEMOIRS

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## **Basil Charles Leicester Weedon. 18 July 1923 — 10 October 2003: Elected FRS 1971**

Gerald Pattenden

*Biogr. Mem. Fell. R. Soc.* 2005 **51**, 425-436, published 1 December 2005

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BASIL CHARLES LEICESTER WEEDON

18 July 1923 — 10 October 2003



*M. D. Weedon*

## BASIL CHARLES LEICESTER WEEDON

18 July 1923 — 10 October 2003

Elected FRS 1971

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Basil Charles Leicester Weedon, ‘Prof’ to his chemistry colleagues but ‘Jimmy’ to his friends and family, died on 10 October 2003. He had two distinct careers, the first as Professor of Organic Chemistry at Queen Mary College, London, over the period 1960–76, and the second as Vice-Chancellor of Nottingham University from 1976 to 1988.

### BIOGRAPHICAL OUTLINE

Basil Weedon was born in Southfields, Wimbledon, on 18 July 1923 to Florence and Charles Weedon. Weedon’s father qualified as a dentist at the relatively late age of 40 years, after leaving the army at the end of World War I. His mother, Florence, came from a Yorkshire family of prosperous jewellers. When Basil was only 9 years old his parents separated and his mother left, taking with her Basil’s sister Christine, who was 18 years old at the time. At his own request, Basil stayed with his father, who then established his dentist practice in the family house in Wimbledon. Sadly, after a few years the young Basil lost all contact with his mother and sister, and it was never resumed. Basil adored his father and they developed a very close bond, which persisted throughout their lives.

At the outbreak of World War II, Basil was evacuated to a farm near Guildford, where he attended a local school and took entrance exams to university. In 1940 Basil entered Imperial College, London, to read for a degree in chemistry, which he was awarded when he was just 19 years old. He then researched for his PhD at Imperial College before joining the Dyestuffs division of ICI Ltd at Blackley, Manchester, as a research chemist. The attraction of academe was clearly too much for young Basil, however, and in 1947 he returned to Imperial College as a lecturer in organic chemistry, becoming Reader in 1955.

Basil’s future wife, Barbara Dawe, served in the Women’s Royal Naval Service (WRNS) during World War II as a Torpedo Mechanic and Electrician. There she met and struck up a

strong friendship with Weedon's cousin, also called Barbara. Basil later met Barbara Dawe and before long they were married, in 1959, and had a daughter, Sarah, and a son, Matthew. In 1960, Basil moved to the Chair of Organic Chemistry at Queen Mary College (QMC), London, where he remained until 1976. It was at QMC that I studied for my PhD degree (1963–66) under the tutorage of the 'Prof'. By 1972 I had moved to a Lectureship in Organic Chemistry at the University of Nottingham, and in 1976 Weedon changed career and was appointed Vice-Chancellor of Nottingham University, a post he held until his retirement in 1988.

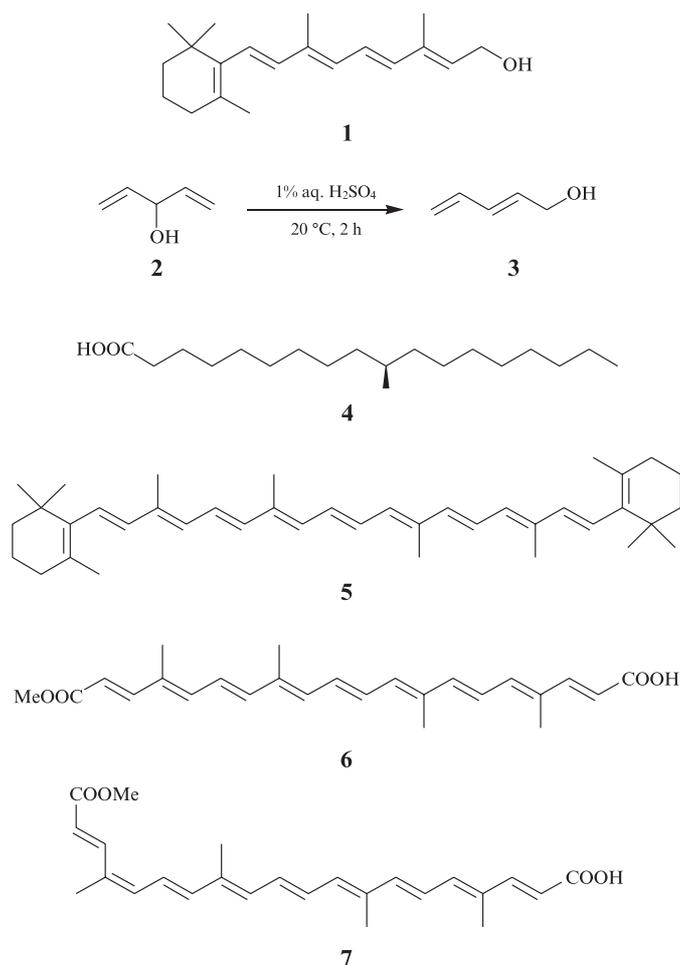
#### SCIENTIFIC WORK

When Weedon started his PhD studies at Imperial College, under the joint supervision of I. M. (later Sir Ian) Heilbron FRS and E. R. H. (later Sir Ewart) Jones (FRS 1950), fundamental studies of the chemistries of acetylenes and polyenes directed towards a synthesis of vitamin A **1** were in progress. Throughout his postgraduate studies, and later when he returned to Imperial College as a lecturer in 1947, he worked with Heilbron and Jones, alongside other talented young researchers, for example D. H. R. Barton (FRS 1954), E. A. Braude, J. C. Craig, J. A. Elvidge, H. B. Henbest, A. W. Johnson (FRS 1965), M. Julia, R. A. Raphael (FRS 1962) and F. Sondheimer (FRS 1967), developing acetylene chemistry and new synthetic routes to polyenes related to vitamin A. Among the many reactions studied by Weedon at this time was the acid-catalysed 'anionotropic rearrangement' of vinylic alcohols leading to the completely conjugated isomer, for example 3-hydroxy-1,4-pentadiene **2** to 1-hydroxy-2,4-pentadiene **3** (1)\*.

Contemporaneously, Weedon began a close collaboration with R. P. (later Sir Patrick) Linstead FRS, studying the synthesis of fatty acids such as tuberculostearic acid (**4**) (2) and their derivatives by electrochemical oxidation reactions, an area of interest that endured throughout his career (17). Nevertheless, and probably as a result of his earlier studies with Heilbron and Jones, Weedon's abiding interest throughout his scientific career was the study of the structure and synthesis of the carotenoid family of brightly coloured polyene pigments found in fruits, flowers, birds, insects and other animals. In this area alone he published about 125 original scientific papers, excluding those with his PhD student mentors.

When Weedon began his studies of carotenoids, relatively few of these unstable tetraterpenes had been fully characterized, let alone synthesized. Indeed, the first total synthesis of  $\beta$ -carotene **5** was published only in 1950, independently by Karrer and Inhoffen. However, the publication of the Wittig olefination reaction in 1959 provided an immense stimulus and opportunity in the area of total synthesis of carotenoids. This important publication also came at a time when proton magnetic resonance (PMR) spectroscopy was becoming widely used in structural studies of natural products. Indeed, in 1960, in a collaboration with L. M. Jackman, Weedon was the first to use this powerful spectroscopic technique in structural and stereochemical studies of natural carotenoids (7). Later Weedon, and several other distinguished scientists, notably Synnøve Liaaen-Jensen, blended synthetic methods, based largely on the Wittig reaction, with powerful analytical and spectroscopic methods, particularly nuclear magnetic resonance (15, 24), mass spectrometry (11) and chiroptical methods (10), to solve

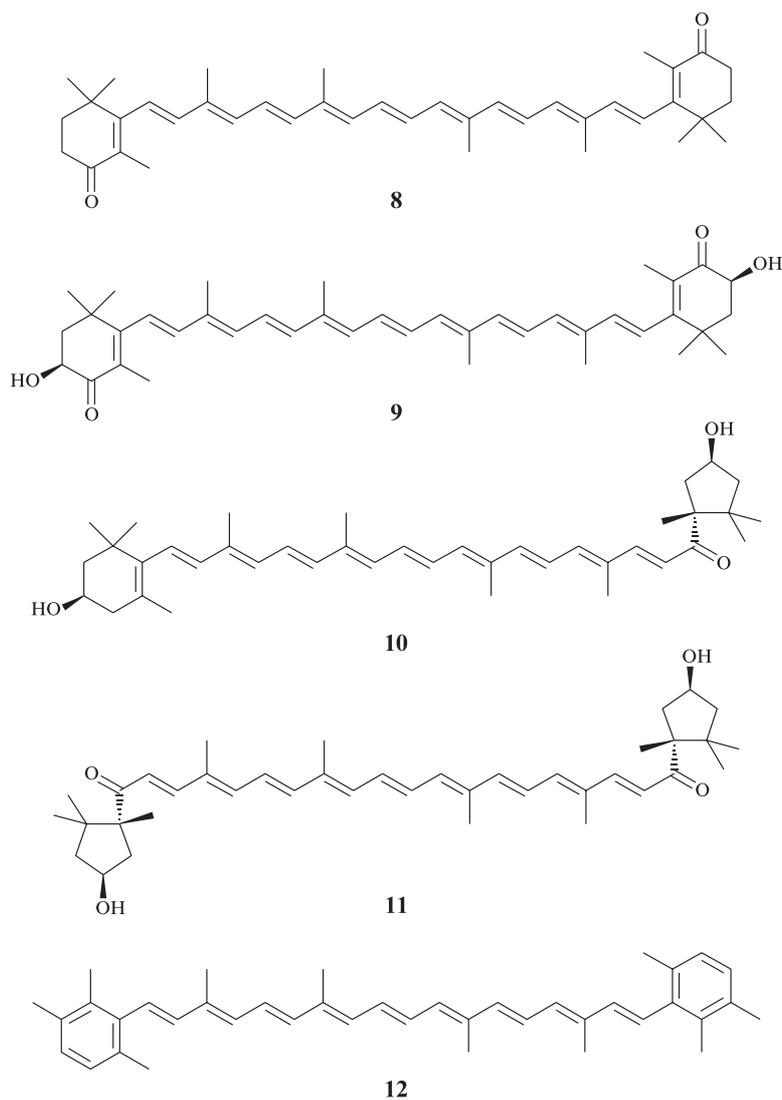
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the structures, the stereochemistries and the biosynthetic interrelationships of a wide range of important naturally occurring carotenoid pigments (18, 19).

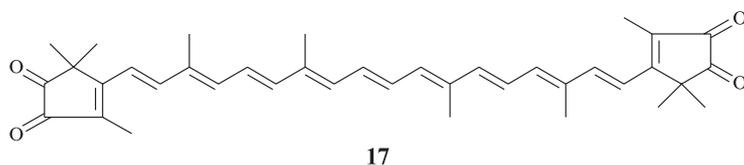
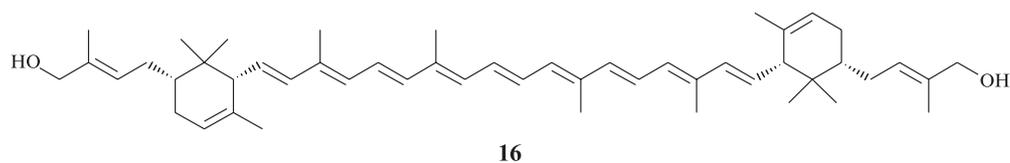
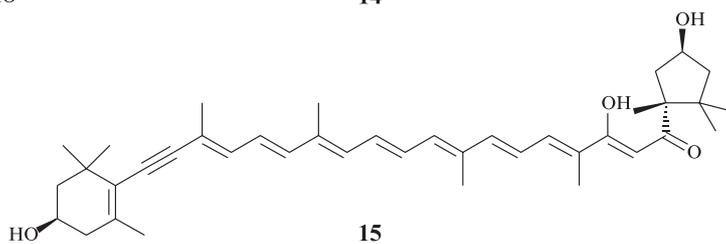
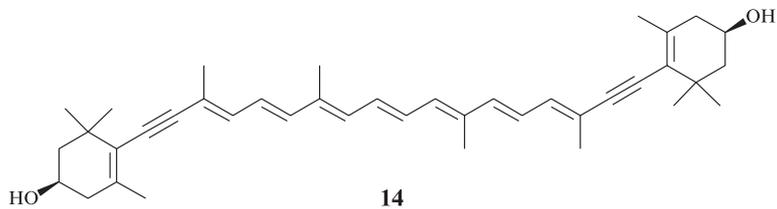
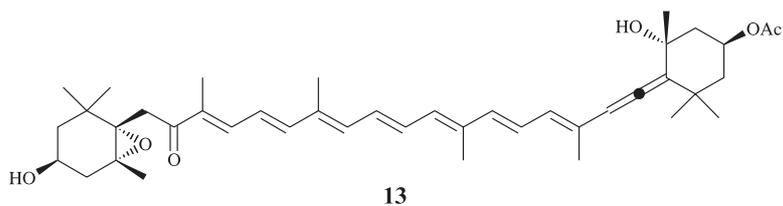
Weedon's first foray into the synthesis of carotenoids was in 1953, when he described a synthesis of all-*trans* methylbixin **6**, the pigment produced when natural bixin from *Bixa orellano* ('annatto') is exposed to iodine (3). Several years later, with L. M. Jackman, he determined the stereochemistry of natural bixin, namely **7**, the first natural carotenoid shown to exhibit *cis-trans* isomerization, using PMR spectroscopy (5, 6). Much to our mutual satisfaction, during my own PhD studies with Weedon I completed a total synthesis of natural bixin, using the Wittig reaction as the key stratagem (13).

Throughout the 1960s and 1970s Weedon and his group established the structures and carried out the total syntheses of a wide range of important naturally occurring carotenoid pigments including the following: canthaxanthin **8** (4), the carotenoid responsible for the brilliant coloured feathers of the flamingo; astaxanthin **9** (16), the chief prosthetic group in the carotenoproteins found in lobsters; capsanthin **10** (25) and capsorubin **11** (26), found in red peppers; and renieratene **12** (8), an aryl polyene isolated from Japanese sea sponges.



His group also established the structure of fucoxanthin **13** (12), the most abundant natural carotenoid found in marine algae (seaweeds), and other novel allenic carotenoids, alongside a variety of acetylenic carotenoids such as alloxanthin **14** (28) from algae, and mytiloxanthin **15** (29) from the common mussel. Weedon also synthesized decaprenoxanthin **16** (21), the first  $C_{50}$  carotenoid pigment to be isolated, from the Gram-positive bacterium *Flavobacterium dehydrogenans*, and a range of interesting blue pigments, for example violerythrin **17** (20), which is produced when certain oxygenated carotenoids are treated with alkali in the presence of oxygen.

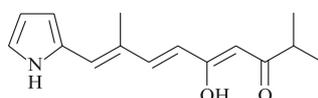
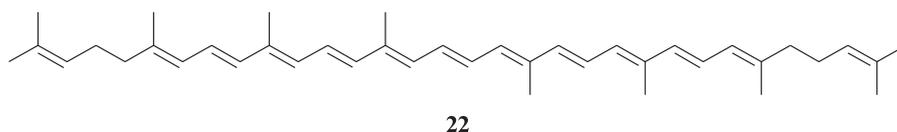
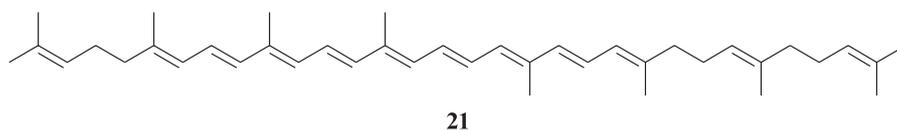
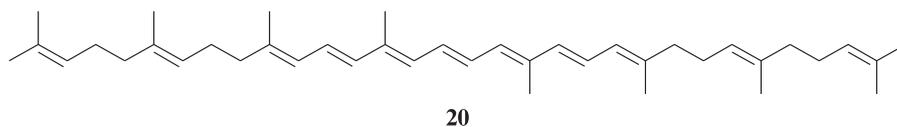
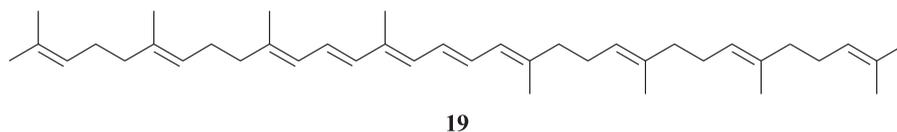
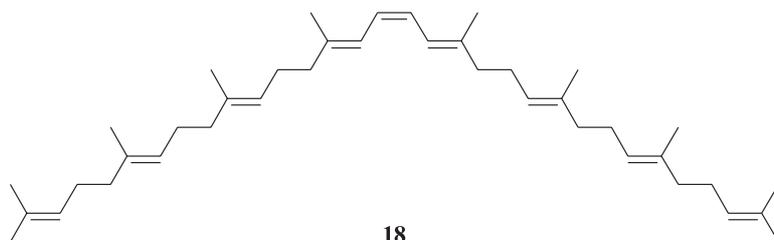
In other fundamental studies Weedon established the structures of the colourless and less-coloured  $C_{40}$  biological precursors, namely phytoene **18**, phytofluene **19**,  $\zeta$ -carotene **28** and neurosporene **27**, to the orange and red carotenoids in the common tomato and carrot, namely



lycopene **22** and  $\beta$ -carotene **1**, respectively (9). His group also made studies of the stereochemistry and synthesis of a new family of pyrrole polyene pigments known as ‘walletrias’, for example walletria A **23**, from fungi (22).

Although polyenes, and carotenoids in particular, were an abiding interest throughout his scientific career, Weedon also studied unusual reactions in strong alkali (14) and autoxidations of fats and fatty acids (27). In a fruitful collaboration with J. H. P. Utley he also studied electro-organic reactions with carotenoids (23), ionones and other substrates.

Weedon received several awards during his scientific career, including the Meldola Medal of the Royal Institute of Chemistry, in 1952, and the Tilden Lectureship of the Chemical Society in 1966. He was elected to the Fellowship of the Royal Society in 1971.



#### VICE-CHANCELLOR OF NOTTINGHAM UNIVERSITY

In addition to his research work with carotenoids at Queen Mary College, Weedon was also Dean of the Faculty of Science at London University and sat on several official bodies at the university and in higher education, for example the University Grants Committee and as Chairman of its physical sciences subcommittee. He was also Chairman of the Food Additives and Contaminants Committee of the Ministry of Agriculture from 1968 to 1983 and was a member of the EEC Scientific Committee for Foods over the period 1974–81.

By the mid-1970s Weedon had become an established and respected scientist, and also a resolute committee man with a flair for administration and a burgeoning interest in policy-

making. In the summer of 1975 Weedon was appointed to succeed J. (now Lord John) Butterfield as Vice-Chancellor at Nottingham University. He took over the post at a particularly challenging time in the development of the university. Nottingham University had gone through a significant postwar expansion, the country's first new medical school of the twentieth century (Queen's Medical Centre, Nottingham) had been completed, and the funding crisis in higher education of 1981 was looming.

Dr Brian Tolley, in his *The History of the University of Nottingham*, published in 2001, says:

Basil Weedon's principal achievement at Nottingham was to preserve the University during a period when there was great uncertainty about the future. He worked conscientiously and diligently to keep the University intact and able to perform its prime functions of teaching and research. There can be no doubt that his careful husbanding of resources ensured that the financial position of the university was very strong. This was an important legacy to his successor.

I was Professor of Chemistry in Nottingham in 1980 and, in 1988, I was appointed to the Sir Jesse Boot Chair of Organic Chemistry. I then held the position of Pro Vice-Chancellor in the university under Weedon's successor C. M. (now Sir Colin) Campbell over the period 1997–2003. I was therefore able to witness how much personal satisfaction Weedon derived in seeing Nottingham flourish and expand throughout the 1990s to become a leading international university.

#### THE MAN AND FAMILY LIFE

'Jimmy' was a very gentle and quiet man. He was totally even-tempered, a good chairman, resolute but diplomatic. He was seen by some as somewhat distant, even shy. To those who knew him better he was a private man, kind and thoughtful to everyone. He had a dry sense of humour and could be mischievous and teasing at times. He also showed a remarkable, if unexpected, flair for public relations.

Family life was precious to Jimmy. He was a devoted family man and the family came first. He was always there for his two children, helping them throughout their education and every aspect of their lives with deep love and trust that was returned absolutely. He had a quiet Christian faith that sustained him throughout his life. One of the greatest blessings of all came in 2003 when his son, Matthew, and his wife, Joanna, presented Barbara and Jimmy with their first grandchild, Miles, an event for which they had longed for so long. Holding and knowing little Miles was a great joy, even if it was only for a short time before his death.

Jimmy listened to classical music in his leisure, and had a keen interest in antique clocks, becoming a member of the Horological Society. He was also an avid reader of the classics, particularly Dickens and Trollope. Jimmy also enjoyed crossword puzzles, an interest fostered by his father-in-law, who had compiled them for the *Daily Telegraph* over many years in the past. In his younger days, Jimmy was a keen Latin American dancer and won several gold medals in competition.

Jimmy loved the countryside, particularly East Devon, where he bought a holiday cottage in 1970. The family had many happy holidays there, when Jimmy liked to swim in the sea off Charmouth and go on long walks. Jimmy enjoyed his food and, above all, his wife's excellent cooking. He was also deeply attached to several dogs that the family kept during his life, and he loved walks with them and caring for them. In his latter years Jimmy suffered from

Parkinson's disease, which he tackled with fortitude and in his usual dignified manner. After his activity became restricted by illness, his music and reading became a great comfort, as did his family and friends, and particularly his beloved golden retriever, who had seldom left his side.

#### HONOURS AND AWARDS

- 1952 Meldola Medal of the Royal Institute of Chemistry
- 1955 DSc, London University
- 1966 Tilden Medalist and Lecturer of the Chemical Society, London
- 1971 Elected a Fellow of the Royal Society
- 1974 Appointed CBE
- 1975 Hon. DTech, Brunel University
- 1988 Hon. LLD, Nottingham University

#### CONSULTANCIES

- 1955–78 F. Hoffman-La Roche and Co Ltd, Basle, Switzerland
- 1975–91 Chairman of the Council of the National Stone Centre
- 1990–94 Chairman of the East Midlands regional Electricity Consumers Committee

#### ACKNOWLEDGEMENTS

The author is grateful for the contributions made by Barbara Weedon and by Jimmy's children, Sarah and Matthew. The frontispiece photograph was taken in 1980 and is reproduced by courtesy of The University of Nottingham.

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