
GODFREY NEWBOLD HOUNSFIELD

Autobiography



I was born and brought up near a village in Nottinghamshire and in my childhood enjoyed the freedom of the rather isolated country life. After the first world war, my father had bought a small farm, which became a marvellous playground for his five children. My two brothers and two sisters were all older than I and, as they naturally pursued their own more adult interests, this gave me the advantage of not being expected to join in, so I could go off and follow my own inclinations.

The farm offered an infinite variety of ways to do this. At a very early age I became intrigued by all the mechanical and electrical gadgets which even then could be found on a farm; the threshing machines, the binders, the generators. But the period between my eleventh and eighteenth years remains the most vivid in my memory because this was the time of my first attempts at experimentation, which might never have been made had I lived in a city. In a village there are few distractions and no pressures to join in at a ball game or go to the cinema, and I was free to follow the trail of any interesting idea that came my way. I constructed electrical recording machines; I made hazardous investigations of the principles of flight, launching myself from the tops of haystacks with a home-made glider; I almost blew myself up during exciting experiments using water-filled tar barrels and acetylene to see how high they could be waterjet propelled. It may now be a trick of the memory but I am sure that on one occasion I managed to get one to an altitude of 1000 feet!

During this time I was learning the hard way many fundamentals in reasoning. This was all at the expense of my schooling at Magnus Grammar School in Newark, where they tried hard to educate me but where I responded only to physics and mathematics with any ease and moderate enthusiasm.

Aeroplanes interested me and at the outbreak of the second world war I joined the RAF as a volunteer reservist. I took the opportunity of studying the books which the RAF made available for Radio Mechanics and

looked forward to an interesting course in Radio. After sitting a trade test I was immediately taken on as a Radar Mechanic Instructor and moved to the then RAF-occupied Royal College of Science in South Kensington and later to Cranwell Radar School. At Cranwell, in my spare time, I sat and passed the City and Guilds examination in Radio Communications. While there I also occupied myself in building large-screen oscilloscope and demonstration equipment as aids to instruction, for which I was awarded the Certificate of Merit.

It was very fortunate for me that, during this time, my work was appreciated by Air Vice-Marshal Cassidy. He was responsible for my obtaining a grant after the war which enabled me to attend Faraday House Electrical Engineering College in London, where I received a diploma.

I joined the staff of EMI in Middlesex in 1951, where I worked for a while on radar and guided weapons and later ran a small design laboratory. During this time I became particularly interested in computers, which were then in their infancy. It was interesting, pioneering work at that time: drums and tape decks had to be designed from scratch. The core store was a relatively new idea which was the subject of considerable experiment. The stores had to be designed and then plain-threaded by hand (causing a few frightful tangles on occasions). Starting in about 1958 I led a design team building the first all-transistor computer to be constructed in Britain, the EMIDEC 1100. In those days the transistor, the OC72, was a relatively slow device, much slower than valves which were then used in most computers. However, I was able to overcome this problem by driving the transistor with a magnetic core. This increased the speed of the machine so that it compared with that of valve computers and brought about the use of transistors in computing earlier than had been anticipated. Twenty-four large installations were sold before increases in the speed of transistors rendered this method obsolete.

When this work finished I transferred to EMI Central Research Laboratories, also at Hayes. My first project there was hardly covered in glory: I set out to design a one-million word immediate access thin-film computer store. The problem was that after a time it was evident that this would not be commercially viable. The project was therefore abandoned and, rather than being immediately assigned to another task I was given the opportunity to go away quietly and think of other areas of research which I thought might be fruitful. One of the suggestions I put forward was connected with automatic pattern recognition and it was while exploring various aspects of pattern recognition and their potential, in 1967, that the idea occurred to me which was eventually to become the EMI-Scanner and the technique of computed tomography.

The steps in my work between this initial idea and its realisation in the first clinical brain-scanner have already been well documented. As might be expected, the programme involved many frustrations, occasional awareness of achievement when particular technical hurdles were overcome, and some amusing incidents, not least the experiences of travelling across London by public transport carrying bullock's brains for use in evaluation of an experimental scanner rig in the Laboratories.

After the initial experimental work, the designing and building of four original clinical prototypes and the development of five progressively more sophisticated prototypes of brain and whole body scanner (three of which went into production) kept me fully occupied until 1976. Since then I have been able to broaden my

interest in a number of projects which are currently in hand in the Laboratories, including further possible advances in CT technology and in related fields of diagnostic imaging, such as nuclear magnetic resonance.

As a bachelor, I have been able to devote a great deal of time to my general interest in science which more recently has included physics and biology. A great deal of my adult life has centred on my work, and only recently did I bother to establish a permanent residence. Apart from my work, my greatest pleasures have been mainly out-of-doors, and although I no longer ski I greatly enjoy walking in the mountains and leading country rambles. I am fond of music, whether light or classical, and play the piano in a self-taught way. In company I enjoy lively way-out discussions.

From *Les Prix Nobel. The Nobel Prizes 1979*, Editor Wilhelm Odelberg, [Nobel Foundation], Stockholm, 1980

This autobiography/biography was written at the time of the award and later published in the book series *Les Prix Nobel/Nobel Lectures*. The information is sometimes updated with an addendum submitted by the Laureate. To cite this document, always state the source as shown above.

Godfrey N. Hounsfield died on August 12, 2004.