transitions from higher to lower atomic energy levels induced by the incident light. This represents negative dispersion since it opposes the effect of absorptive transitions from lower to higher levels. In retrospect this work appears as an important landmark on the long road from Einstein's conception of the idea of stimulated emission in 1919 through the various radio frequency and microwave magnetic resonances which are dominated by the competition between stimulated emission and absorption, to crystal masers and finally, ending not far from the starting point, to the helium-sensitized neon gas laser with its immense possibilities for research and technologies.

Kopfermann's first work on nuclear hyperfine structure and isotope shift overlapped the final phases of his work on negative dispersion which involved high-resolution techniques. Working under the same roof with Hahn and Lise Meitner, and not far from the Einsteinturm in Potsdam where Schüler had pioneered the hollow cathode cooled light source, he was naturally attracted to this very fruitful field of application of spectroscopy which in one form or another was to be his main interest for the rest of his life.

A period in Bohr's Institute in Copenhagen, where he collaborated with Rasmussen on a number of problems of hyperfine structure, had a profound influence on him. He shared with Bohr an essential humility, epitomized by the *Nur um zu lernen* (only in order to learn), one of the many Bohrisms which Kopfermann used to quote and to live by. Indeed, those fortunate to have worked with or under him will remember him, above all, as the true mentor and friend who guided them through their difficulties and whose deep insight into the essential physics beyond the immediate experimental problems inspired them to do their best creative work.

On return to Berlin he became *Privatdozent* at the University, still continuing his work on nuclear hyperfine structure and isotope shift in the Kaiser Wilhelm Institute, but later moved to Gustav Hertz's Institute at the Technische Hochschule, Berlin. It was here that he initiated projects on the separation of isotopes for nuclear spectroscopy which fitted in with Hertz's interests at the time, and were carried out by Walcher and Paul, his faithful collaborators for the next ten years.

In 1937 he took up his first chair in the University of Kiel. In the difficult pre-war period and under the restricted conditions of a small University, the pace of experimental work had to slow down. Kopfermann utilized this interval for writing his book on nuclear moments in which he showed a remarkable grasp of a subject which was then in its beginning, and a clear vision of its significance for the understanding of nuclear structure. So much so, that the *Kernmomente* of 1956—or its English version of 1958—was truly a second edition, unchanged in plan and conception but expanded to almost twice the size of the original book by the lucid and original presentation of all the new developments of the post-war era, such as nuclear resonance techniques.

The call to Göttingen which Kopfermann followed in 1942, to occupy the chair at the Second Physical Institute from which his great teacher, James Franck, had felt compelled to resign in 1933, must have filled Kopfermann with pride and sadness, for his attitude *vis-à-vis* the Nazi régime was uncompromising and without reproach. His loyalty was to his friends and to science, and there are many who will remember Kopfermann's active help with gratitude.

Göttingen, which had escaped serious destruction, became in the immediate post-war years a haven where the *élite* of German science, v. Laue, Heisenberg, Weizsäcker, etc., congregated. It was during this period that, apart from notable work with Paul on the Lamb shift in helium, Kopfermann made his most outstanding contribution to the study of nuclear structure. In collaboration with Brix, he discovered jumps in the relative isotope shift of heavy elements which he related to the quadruple moment and deformation of the nuclei, ideas which led Aage Bohr and Mottelson to the dynamical model of the nucleus. In the same period, Dehmelt and Krüger inaugurated under his inspiration the method of nuclear electric quadruple resonance which now, like nuclear magnetic resonance, occupies an important place in the study of the electronic structure of molecules.

It may be less well known that Kopfermann initiated and supported research in pure nuclear physics, particularly nuclear photo effects. This goes back to the war-time, when very soon after Kerst's first publications he persuaded Paul to develop a betatron. The first machine was completed about the end of the War. Undaunted by the strict regulations of the military government which forbade its use for nuclear studies, Kopfermann collaborated with his medical colleagues on methods of direct electron therapy which appeared very promising at the time. His fine article in the *Ergebnisse der Exakten Naturwissenschaften* on the "*Elektronenschleuder*" ('electron sling' for betatron, a valiant, but alas unsuccessful, attempt to stem the flood of pseudo-Greek atrocities) reflects the enjoyment and active interest which Kopfermann took in these more technical developments.

Kopfermann's move to his last station marked the beginning of a more prosperous era so far as material support for scientific research in Germany was concerned. Under his direction the Physical Institute at Heidelberg has developed into one of the best-equipped and most-productive laboratories for the study of the nucleus by atomic spectroscopy, atomic beam methods, various types of optical double resonance, by accelerators and other techniques of more strictly nuclear physics. Up to the last he took a very active part in the researches, inspiring and encouraging his devoted students and collaborators. To see so many of them in leading positions in universities and industry, eight in important chairs in Germany, two in chairs in the United States, must have given him deep satisfaction. Although he shied away from official positions, his views commanded great respect, and in the background he exercised a beneficial influence on the higher direction of science and physics in Germany.

Kopfermann had many interests outside physics. To join in chamber music on his viola in a small circle of his colleagues and friends was his great joy and happiness. The warm glow and youthful freshness of his personality endeared him to all who met him. E. E. Schneider

Prof. E. B. Moullin

The death of Prof. Eric Balliol Moullin on September 18 at the age of seventy will have saddened many members of the electrical engineering profession, and particularly those who were privileged to be old students of his at Cambridge or Oxford.

He was born on August 10, 1893, at Sandbanks, near Swanage, and his later attachment to radio frequency measurements may have been influenced by the fact that his birthplace was within a few hundred yards of the site of the first wireless mast set up in Britain by Marconi. He was educated privately and learned at home the mathematics which won him a scholarship at Downing College, Cambridge. He took first-class honours and was the John Winbolt Prizeman in the Mechanical Sciences Tripos. Owing to a breakdown in health he was unfit for military service in the First World War, but taught for part of this period at the Royal Naval College, Greenwich, before returning to Cambridge in 1919 as university lecturer in engineering, and member of King's College.

At the time radio—or wireless as it was then called—was in its infancy, and Moullin was among the first to devise accurate means of measuring the characteristics of components, circuits and radiating systems for use at radio frequencies. His invention in the early 1920's of the

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valve voltmeter, and the first edition of his book, *Radio Frequency Measurements*, exercised a profound influence on the early development of the subject. However, his interests were not confined to radio. He taught over the whole field of electrical engineering and made contributions outside it, such as the devising of a torsiometer for the measuring of torsion in rotating shafts, with which he experimented on the liner *Franconia* during an Atlantic crossing.

The establishment of a readership in engineering science attracted him to Oxford and to Magdalen College in 1929, and he in turn attracted to its small engineering school as research students a succession of men who benefited enormously from his stimulating inquisitiveness and incisive search for understanding. He supervised programmes of research into the properties of dielectrics, the mechanisms of electrical noise and the characteristics of aerial systems, and was always at pains to ensure that his own publications in these fields—which were many—did not detract from those of his young colleagues, to whom he gave intimate personal attention.

It was perhaps unfortunate that his services were lost to teaching during the Second World War, but he was anxious to play a direct part in the development of new radio and radar devices, and, in 1939, he joined the Admiralty Signals Establishment at Portsmouth for this purpose. In 1942 he transferred to the Research Laboratories of Metropolitan Vickers in Manchester, and found many opportunities there to apply his outstanding mathematical and experimental abilities to similar ends.

At the end of the War he returned to Cambridge as the first professor of electrical engineering and as a Fellow of King's College, and he then devoted himself to the reorganization of the teaching arrangements in his subject and the preparation of books on aerial systems and on electrical machines. He also gave unsparingly of his time to the work of the Institution of Electrical Engineers, and was its president during the 1949–50 session. He was elected to honorary membership of the Institution earlier this year.

Moullin's contributions to teaching and research spanned a period of quite fantastic change. During this period several new branches of his subject emerged, became of considerable industrial importance, and demanded educational attention. He searched continually for the interrelationships between these specialist fields and for means of presenting them as components in a coherent whole, and his efforts were of great assistance to others who, like himself, were not finding this an easy matter.

Eric Moullin was extremely proud of his Guernsey ancestry and was overjoyed when, in 1947, he inherited the Fief des Eperons as great-great-great-grandson of Jean Rougier. In this capacity it fell to him to pay his feudal homage when the Queen visited the Island in 1957, and to offer to Her Majesty, on bended knee, a pair of golden spurs dating back to 1675. As Seigneur de Fief des Eperons he was hereditary head of the feudal court, comprising a Seneschal and a Douzaine of honest men, which had powers over boundaries and other matters of land in Guernsey.

WILLIS JACKSON

NEWS and VIEWS

David Rivett Memorial Lecture

FOLLOWING the death in April 1961 of Sir David Rivett, formerly chief executive officer and later chairman of the Australian Council for Scientific and Industrial Research (*Nature*, **190**, 958; 1961), several of his colleagues proposed that a suitable memorial should be established to help preserve the vigorous stimulus of his leadership. Sir David, more than any other person, was responsible for establishing the pattern of the Commonwealth Scientific and Industrial Research Organization as it is known to-day. Those who worked with Sir David felt that the most fitting memorial to him would be the establishment of a memorial fund which could be used to finance a formal lecture to be delivered in one or other of the capital cities of Australia every two years by a man who had reached the highest ranks of achievement in scientific research. An appeal for contributions was quickly over-subscribed and a memorial fund established. The first memorial lecture, "Development of Modern Science", was delivered at the Wilson Hall, University of Melbourne, on September 5 by Sir Howard Florey, president of the Royal Society and Nobel laureate (p. 397 of this issue of *Nature*).

Deputy Controller of Aircraft, Ministry of Aviation: Mr. H. Davies, C.B.

MR. H. DAVIES has been appointed deputy controller of aircraft (research and development), Ministry of Aviation, in succession to Mr. M. B. Morgan, who was recently appointed controller of aircraft (see *Nature*, **199**, 431; 1963). Mr. Davies was born at Aberdare, South Wales, in 1912, and was educated at Aberdare Grammar School and University of Wales (Cardiff). He entered the Scientific Civil Service in 1936 and served at the Royal Aircraft Establishment until 1942. During the period 1942–46 he was employed at Headquarters on the long-term planning of Air Staff Requirements. He then returned to the Royal Aircraft Establishment and in 1948 became Superintendent of the Aero Flight Division. He was promoted to deputy chief scientific officer in 1952 and appointed chief superintendent, Aeroplane and Armament Experimental Establishment, Boscombe Down, where he remained until 1955, when he was promoted to chief scientific officer and seconded to the Air Ministry as scientific adviser. In 1956 he was appointed director general of scientific research (air), and since 1959 he has been serving as deputy director (air) at the Royal Aircraft Establishment, Farnborough.

Mr. L. F. Nicholson

MR. L. F. NICHOLSON has been appointed deputy director (air) at the Royal Aircraft Establishment, Farnborough, in succession to Mr. H. Davies. Mr. Nicholson was born at Watford in 1918, and was educated at Taunton School and King's College, Cambridge. He entered the Scientific Civil Service in 1939 and served at the Royal Aircraft Establishment, Farnborough, until 1959. He became superintendent of the Supersonics Division of the Aerodynamics Department in 1951 and was promoted to deputy chief scientific officer in 1953. In 1956 he was promoted to chief scientific officer and appointed head of the Aerodynamics Department. Since 1959 he has been serving as director general of scientific research (air).

Psychiatry at Leeds: Prof. M. Hamilton

DR. M. HAMILTON has been appointed to the Nuffield chair of psychiatry in the University of Leeds, in succession to the late Prof. G. R. Hargreaves, from a date to be arranged. Dr. Hamilton was educated at the Central Foundation School, Cowper Street, University College and University College Hospital Medical School, London. He gained his M.B. and B.S.(London) in 1937. In 1946 he was awarded the Diploma in Psychological Medicine and a doctorate in medicine of the University of London in 1950. From 1934 until 1939, Dr. Hamilton worked in the field of general medicine and surgery and

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