JOHN CADMAN, BARON CADMAN

1877–1941

THE RIGHT HON. SIR JOHN CADMAN, first Baron Cadman of Silverdale, in the County of Stafford, was born in the north Staffordshire mining village of Silverdale on 7 September 1877. He was christened and confirmed in the village church there, and in a grave near its entrance he decided that his ashes should rest. 'It is there', he said, 'that I belong.' The writer, who was present at his funeral, was much struck by the attachment of the villagers to their old friend 'Jack'. Throughout his life he never forgot them, and when the end came they showed that they had not forgotten him.

Cadman was educated at the High School, Newcastle-under-Lyme, and studied mining under his father, Mr James Cope Cadman, M.I.C.E. When in 1922 he was elected President of the Institution of Mining Engineers he reminded the members that, eighteen years before, his father occupied the same presidential chair. He won a Staffordshire County Council Scholarship for mining which he held at the Durham College of Science, now Armstrong College; there he took his B.Sc. degree with honours and subsequently took the M.Sc. and the D.Sc. At twenty-two he worked as assistant manager at the Silverdale Collieries, and at twenty-three was appointed manager of the Collieries of Trindon Grange. A few years later he was made one of H.M. Inspectors of Mines, and among the districts he covered was one containing Scottish Shale. Thus it was that Cadman made his first contact with oil.

The period of his services as an inspector was a time of many serious explosions in mines, and he never spared himself in visiting the scenes of such disasters at the earliest possible moment after their occurrence. In this work he was keen to find out the causes,

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and then to seek a remedy. Many of his investigations were undertaken in co-operation with the late Dr J. S. Haldane, who was a great admirer of his work. Haldane knew of his intense interest in coal and his great desire to help that industry and especially the miners. Both deprecated the dangers of over-legislation believing that every one connected with the industry, from the Inspectors of Mines down to the pony drivers, were so tangled up with parliamentary mine regulations that it was difficult for them to move. In his later years Cadman was an advocate of the coal industry becoming a single entity controlling all operations from production to retail sale. He pointed out that when that status was attained competition between individual collieries would virtually disappear, and the industry as a whole would study its problems as a whole. Those who bought coal were not interested in coal as a substance but as a form of energy, and he pressed that the coal industry should organize itself to give to its customers so many millions of calories in the form best suited to their requirements. He continuously advocated the complete gasification of coal, believing that this would lead us much nearer to a smokeless England, and at the same time enable cheap gas to be made available in millions of homes as well as in industry. Often, when serving on a 'coal' committee he would laugh at a stray suggestion that he was biased in favour of oil. It was indeed difficult to believe that Cadman was at any time biased; he loved the truth and was always willing to believe. He never regarded oil as a rival of coal, but rather as an ally and associate.

When he lived at Silverdale as a boy there were twenty-two collieries working in the area; there were blast furnaces and finished iron works in Silverdale, Knutton and Chesterton. The whole neighbourhood bustled with industry, and the future looked secure. In 1938, when Cadman received the freedom of the neighbouring town of Newcastle-under-Lyme, he contrasted the prosperity of his boyhood days with the depressed outlook then. He reminded the Mayor and Corporation that the area was still well endowed with great reserves of coal and rich deposits

of ironstone, and if fault was to be found it was because man had not seen fit to seek and apply scientific knowledge to utilize and profit from the benefactions of nature.

He was awarded a gold medal by the City of Birmingham for conspicuous bravery in connexion with the Hamstead Colliery disaster which occurred near Birmingham in 1908, and, for conspicuous service in other mine disasters, he held the North Staffordshire Brigade Rescue medal with five clasps.

In 1904 Cadman was asked by the Government of Trinidad to regulate the digging of asphalt in that colony. At the time the digging of asphalt was causing endless litigation; the great pitch lake was hardly recognized as evidence of the existence of oil, and the petroleum industry of the island could scarcely be said to exist. He succeeded in settling many knotty problems to the satisfaction of all concerned, and did much to stimulate the development of the colony's oil industry. During his stay of four years, he organized the Mines and Petroleum Department. He lived in Trinidad continuously for four years, and it was there he met his future wife, Lilian Harrigan, whom he married in 1907.

On his return to England in 1908 he served on a Royal Commission on Mines, and two years later he was appointed Professor of Mining at Birmingham University. There he established the Department of Petroleum Technology, the first of its kind in the Empire. He at once became one of the leading exponents of the petroleum industry, and in particular he stressed the application of science in all its operations. There is little doubt that he would have been content to remain a Professor of Mining and to blaze a scientific trail, but his country needed him in other directions. It was in May 1908 that the first great oil 'gushers' of Iran was struck at Masjid-i-Sulaiman. Development proceeded rapidly; a pipe line was built across the mountains and the desert to the head-waters of the Persian Gulf 145 miles away; a great refinery was built on the shores of the Shatt-al-Arab; tankers were ordered to transport the oil, and an immense distributing organization was planned for its disposal.

In 1913 this Iranian field was beginning to produce oil in quantity. At that time, the Admiralty, under the guidance of Lord Fisher and the stimulus of Mr Winston Churchill, was turning the British Navy over from coal to oil; it was a tremendous step to take, for Great Britain possessed no indigenous supply. An Admiralty Fuel Oil Commission was appointed by Mr Winston Churchill, of which Cadman was a member, and he went to Iran to report upon the Iranian oil fields. The help he gave to the commission made it very certain he would soon be called on again, and in 1917 during the Great War, when there was a serious shortage of fuel oil for the Navy, and the Army had but a few days' supply of motor fuel, Cadman became Director of the Petroleum Executive and later Chairman of the Allied Petroleum Council. This body controlled all oil supplies for the Allied Forces, and there is no doubt that Cadman's work contributed vitally to the success of the war.

Lord Haig paid the following tribute to his work:—

'The success which happily attended our administration is entirely due to his great ability, wonderful industry and unsurpassed knowledge of oil questions. . . . In all the long list of services rendered by both men and women, which contributed to the ultimate victory, there is none which stands higher than the work which Sir John Cadman did.'

For these services he was made K.C.M.G., Officer of the Légion d'Honneur and Knight Commander of the Crown of Italy.

Cadman became a technical adviser to the Anglo-Persian Oil Company in 1921, and shortly afterwards a director, but he showed that he was far more than a technical expert, and early in 1929 he succeeded Lord Greenway as chairman of the company, the first 'professor' scientist to become chairman of an industrial company with a capital of tens of millions of pounds. Sir Thomas Holland, commenting on this appointment has said:—

'Thereafter he added strength with symmetry to a great commercial industry by establishing within its structure a research

organization which has contributed substantially to the body of pure science in the relative branches of chemistry, physics, geology and geophysics.'

Cadman's entry into the oil industry was at a most momentous time. During the war of 1914–1918 the internal combustion engine, like so many other inventions, had been developed at a rapid rate, and quantity production of motor cars was expanding in the United States and spreading to Europe. The Diesel engine was in use on land and at sea, and oil, as a fuel for ships, threatened to replace coal. The potential demands on the petroleum industry were foreseen by Cadman in that wide vision that so distinguished him, and he shaped his efforts and those of the company of which he was the head to meet all demands sanely and without waste. It is probable that there was no man of his time with the same encyclopaedic knowledge of the oil industry; he was expert on all its phases from the initial geophysical demarcation of the oil-bearing structure, the technology of drilling, the chemistry of refining, the corrosion of pipe lines to the construction of tankers.

As an outcome of the continuous application of scientific methods to the examination of the main producing areas of Iran, the structural complexities of these areas have been so successfully studied that full reliance can be placed upon calculations of the magnitude of the oil reservoirs. This scientific development of the Iranian oil fields and the great pipe lines of Iraq were matters of great pride to Cadman. Each oil field was drilled in a comparatively few places, the oil flow from each well being regulated so as to maintain uniformity of oil level throughout the field. At each well head there was regular inspection of level, rate of flow, underground temperature and oil pressure, and a central control station regulated the rate of flow from the wells. These Iranian oil fields are unique among the oil fields of the world inasmuch as unwanted products of the refinery are pumped back into the wells, and this notwithstanding that at many well heads the natural oil pressure exceeds 2000 lb. per square inch. In all such plans Cadman showed great depth of knowledge as

well as width of outlook. Some there were who looked upon the Iranian scheme as unnecessary and grandiose. After its completion the critics admitted their mistake, and now there are few who do not highly appraise the scientific planning of the Iranian fields.

As in the fields, so it was in the refinery at Abadan, which grew to be the largest oil refinery in the world. Even in Cadman's time the technique of petroleum changed rapidly, and with increased scientific knowledge so was the plant adapted to produce better and more uniform products. Cadman had many ideals, but none gave way to his main desire to know 'why' as well as to know 'how'.

In addition to being Chairman of the Anglo-Iranian Oil Co. he was was Chairman of the Iraq Petroleum Co., the pipe lines of which start in the fields and end on the coasts of Palestine and the Lebanon. Oil was discovered in Iraq in October 1927, and as there was no local market for the great quantities of oil which were available, at least one pipe line had to be laid to a port in the Mediterranean. Eventually it was decided that the line should debouch at two points, Tripoli in the north and Haifa in the south. The distance between the two points to be connected was about 600 miles and some idea of the magnitude of the undertaking may be judged from its cost, which was £9,250,000. Almost the entire route lies in desert wastes unequipped with roads or railways, passing very few towns and unpopulated save for scattered tribes of nomads. Material, medical supplies and food had to be conveyed from the Mediterranean and the Persian Gulf, and by the time the work was finished, 37 million ton miles of traffic had been handled. The problems associated with this pipe line were both difficult and attractive, and on many occasions Cadman spoke of the great help he had received from physicists, metallurgists and engineers.

He, more than any other person, was instrumental in abolishing the aggressive commercial policy which at one time threatened not only those engaged in the oil industry but the countries producing oil. He pleaded with success for a sane nationalism,

regarding oil neither as a heavy intoxicant for oneself nor as a deadly drug for one's political competitors, but rather as a store of energy to be conserved, released and applied as part of a concerted operation, owing its inception to more than one nation and yielding its tribute to more than one treasury.

In a speech at Chicago in 1929 he summarized his views very briefly as follows:—

'We must all do our share towards promoting a policy of sane and honest internationalism in industry. Co-operation between nations and international forces there must be, in some form or other, if we are not to squander the world's heritage.'

The same spirit of conservation was his policy when he spoke of the 'absolutely unlimited multiplication of facilities for the so-called service of the motorist'. He wondered whether there was supposed to be some virtue in piling up the number of pumps, of rail and road wagons and of service stations. He considered such multiplication to be an evil, and did his utmost, again with much success, to attain equilibrium between service and supply.

Remarking on the results of his international efforts, Sir William Fraser pays the following tribute:—

'The measure of success which, together with others of a like mind, he achieved, was amply demonstrated during the years when potential production outstripped all possible demand and when production let loose would have put an end to orderly development, to say nothing of ruining thousands of smaller participants in the industry, as well as some of the larger, and leaving the world the poorer by the dissipation of an irreplaceable natural asset.'

Cadman was a Director of the Suez Canal Company and of the Great Western Railway. He sat on numerous Government Committees including the Prime Minister's Economic Advisory Council, the Lord President's Advisory Council for Scientific and Industrial Research, the Government Industrial Transference Board, the Safety in Mines Board, the Fuel Research Board, the Coal Advisory Committee, the Committee of Enquiry into Civil Aviation, over which he presided, and the Committee of

Enquiry into the Post Office. When the Bridgman Television Committee was set up he was appointed Vice-Chairman, and on the death of Lord Selsdon he became Chairman.

He took the greatest interest in television, and followed step by step the development of the transmitter and the many types of receivers both electrical and mechanical. His keen brain saw that this development would in time revolutionize the transmission of information to millions of people the world over. He was anxious that Great Britain should retain the lead in this discovery, and in 1939, on the outbreak of war, he was preparing a memorandum for the Postmaster-General in which he advocated the construction of other transmitter stations than the one at Alexandra Palace. His knowledge of atomic physics much surprised Rutherford, who jokingly told Cadman that he should leave the world of oil and join his band of adventurers who were exploring atomic worlds. In subsequent conversation Cadman told us that often he regretted leaving his professorial chair at Birmingham; he loved research and believed that had he continued at Birmingham he might have made some contribution to scientific knowledge. But this was not to be. However, he gained much satisfaction in following the work of others; the work of the Cavendish Laboratory he had followed for over twenty years, and I have a suspicion that he helped to finance some of it. However that may be, certain it is that his scientific knowledge was very exceptional for a man who was classified as an industrialist. Rutherford and Cadman were great friends, and when Cadman was raised to the peerage in 1937, Rutherford wrote and said he would be delighted to introduce him into the House, which he did. Although his period of service in the House of Lords was brief he spoke with great effect on Fuel Supplies in war time and on the British Overseas Airways Bill. This latter translated the bulk of the recommendations of the Committee of Enquiry into Civil Aviation, of which Cadman was chairman, into legislative form. Naturally, Cadman spoke in favour of the Bill believing it to be a great turning point in British Civil Aviation. The time was August 1939; the clouds of war

were gathering fast and Cadman's concluding remarks are worth quoting here:—

'I welcome this latest addition . . . as a further indication of the Government's determination to impress upon the outside world that Britain is still a great and virile power, and that we shall be resolute in upholding the traditions of overseas trade and communications which are among the principal sources of our national strength.'

Cadman was one of the founders of the Institute of Petroleum and was its President in 1915 and again in 1936. He occupied also the presidential chairs of the Institutes of Fuel, of Mining Engineers (for three successive periods) and of the Society of Gas Engineers. He was made a C.M.G. in 1916, a K.C.M.G. in 1918 and a G.C.M.G. in 1929. He had also several foreign honours, including the First Class Order of the Rafidain, and he was a Pasha First Class of Transjordan. He was an honorary LL.D. of Birmingham University and an honorary D.Eng of Melbourne University. He was elected a Fellow of the Royal Society in 1940, and was a member of the Lord President's Council of the Department of Scientific and Industrial Research for two periods, the first from 1920 to 1928 and the second from 1934 to 1939. He was a keen supporter of the Industrial Research Association movement, and frequently expressed his opinion that in this country the application of science to industry had not had reasonably favourable conditions in which to develop its influence. He regretted that some scientists in their wisdom thought it right to attempt to divide the realms of science into two hemispheres, one of 'pure' science and the other of 'applied' science. He never doubted that this distinction had injured, or at least retarded, the steady value of science's contribution to industry. He had a very long talk on this topic with members of the Lord President's Advisory Council in 1936. The oil industry, he reminded us, was in general regarded as a haphazard one of spasmodic drilling for oil and refining the product by crude distillation methods. Instead it was an industry founded on firm scientific principals. It was true that in the earlier days a seepage of oil or gas was the prospector's sole guide to the

existence of a subterranean reservoir of oil. But in more recent times there were not enough seepages to go round and the necessity for finding oil without a surface indication of its presence gave rise to a variety of theories regarding its accumulation. To-day, Cadman reminded us, methods based on these theories are used, and numerous scientists who are expert in geology, palaeontology, geophysics and chemistry are employed. Many of these have not only made their contribution to the oil industry but have added substantially to scientific knowledge. The instruments used by them are among the most sensitive ever made, one of them, of a most robust character, being used to detect changes in the gravitational constant as small as one part in a million.

On the contacts between science and industry and on the education of youths for industry, he had very definite views. In September 1935 he communicated to *The School Government and Educational Review* a paper on 'Industry's demand of education' which was much discussed by industrial leaders and by educationalists. Cadman pointed out that a survey of the educational system of this country gave the impression of much complexity if not of general confusion. The many different types of institutions—State provided, State supported or merely State supervised—reflected many diverse opinions but did not meet the needs of large industrial and commercial concerns. Education, he contended, should meet the real needs of the community; in this country the needs are many, for example, the provision and preparation of food, the mining of coal, the manufacture of machinery and the provision of power. These needs are co-operative, and in all these spheres the most essential need is properly educated personnel—men and women properly equipped with knowledge, skill and stamina—to operate and to improve upon the processes which constitute an activity.

He laid the greatest stress on the early association of youth with actual conditions of industrial life and with the manual, technical and directive personnel of industry. He stressed the importance of encountering the real issues of life in early formative

years so that young people could prove their adaptability or establish their unsuitability for certain positions. 'It is significant', he said, 'that the Navy—a most successful type of organization—makes a point of taking its novitiates at a very early age.' The enforced relegation or rejection of the technically fit on account of inadaptability of temperament was a fault which must be laid at the door of our system of education, and it brought in its train discontent, instability and many social evils of which these are the unrecognized cause. The spartan method of the successful business man of a past generation who forced his son to start his career at an early age on the lowest rung of the industrial ladder, had an advantage ensuring a real understanding with the worker at every stage of his career, and much of this advantage could be provided if our educational system permitted a break in studies in order to allow our youths to spend a year or so amid the environment of their probable future careers.

His final words on this subject—and they seem most appropriate to-day—were, that knowledge, understanding and sympathy are all essential to true progress in industry. He emphasized the need of studying industrial psychology, and on many occasions drew attention to the relationship between the resting time of individuals, their state of physical fitness and their output of useful work. Always was he insistent that scientific knowledge and training are not by themselves sufficient in industry since in general, science concerns itself with matter rather than human beings. In order to achieve the greatest measure of success and prosperity, men of industry must know something of psychology and indeed be psychologists. They must know how to handle their men, how to pull together with a maximum of result and a minimum of friction, and they must also know how to present a case in its most convincing form.

Cadman's record of public service deserves very special praise. His outlook was singularly wide; he was fully at his ease whether the topic was television, hydrocarbon chemistry, aviation, the coal industry, the design of tankers or the general aspects of industrial research. In his many and varied social functions he

was ably supported by his wife to whom he was deeply attached. He was frequently found at the annual dinners of scientific societies and technical institutions. His speeches were invariably well prepared and always appropriate to the occasion. The Chairman of the Standard Oil Company of New Jersey tells how on one occasion Cadman addressed 3000 oil men of all grades at Chicago. His speech was a great success. At first they expected to find him distant, professorial and hard to get along with, but they quickly learned to admire his keen intelligence, his admirable character and his charming attributes for friendliness.

In private life no one could be more loved and esteemed. He had reverence for all that was good. His utterances were invariably accompanied by a genial smile, and he delighted in relating something of a novel character that had occurred in his day's work. While it must be admitted that his wide technical knowledge and intuition based upon that knowledge were what impressed his friends most, he was imbued with a sense of the far greater importance of the knowledge of humanity, itself. Indeed the value of human relationships and the supreme influence of good feeling and affection in business as well as in private life were axiomatic to him. Many a young man in the employment of the Anglo-Iranian Oil Company looked upon 'the Chairman' as a friend. Fitting it was that at a great public gathering, it should be Cadman who quoted the American poet, Sidney Lanier:—

'Whether man's land was rich or poor,
Thar was more in the man than thar was in the land.'

One of his oldest friends, Sir William Fraser, in a published tribute says:—

'When numerous distinctions had fallen to him and he had become a figure of international repute, he remained essentially the same John Cadman that he was when I first came into close touch with him. His character was unspoiled, his charm of manner never left him, his kindliness and consideration were constant. He was not 'all things to all men', but one man—and that a very human one—to all.'

Although Cadman held strong views on many points and would defend them with vehemence, his arguments were never personal in character, and it was obvious that he was actuated solely by a love to do what he deemed to be right, and it has been said that when John Cadman thought a particular course was right it was almost certain to turn out right in the long run.

When the war broke out in September 1939, he was far from well, but he could not resist the pressure of the call to public service and flung himself into the turmoil. He served as honorary principal adviser on oil to the Government, and in the Ministry of Supply he became the first Chairman of the Scientific Advisory Council. In these and other ways he undertook loads incommensurate with his strength, and a career of public service, almost without parallel in its magnitude and many sided activities, was ended by sacrifice of life itself.

He died peacefully on 31 May 1941, at Shenley Park, his beautiful home near Bletchley, his last words of farewell being to his wife, who had devoted herself to him through a long illness lasting eight months. He left two sons and two daughters. After the burial at Silverdale, a memorial service was held in the village church at Shenley, and a largely attended national memorial service was held in a part of Westminster Abbey which had escaped damage by the enemy's bombs. There, those who knew and loved John Cadman, paid their last tribute.

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