OBITUARY NOTICES.

GEORGE STACEY ALBRIGHT.

1855—1945.

THE death was announced at his residence, Bromesberrow Place, Ledbury, on December 28th, 1945, of George Stacey Albright, C.B.E., M.A., J.P., a director of Messrs. Albright & Wilson, Limited. Born in Birmingham in 1855, he was educated at Grove House School, Tottenham, and Trinity College, Cambridge, where he distinguished himself academically and at the same time was an exceptional athlete and represented the University at Rugby football. He also rowed for his college and took a leading part in other forms of sport. He was admitted to the Fellowship of the Chemical Society in 1879 and was a member of many other learned Societies.

In January 1879 he joined his father, Mr. Arthur Albright, in the firm of Albright & Wilson and became one of the original directors when the Limited Company was formed. He retained his active interest in the affairs of the Company until his death, a period of 67 years. He was closely connected with the development of the firm's business, and in the research laboratories which the firm established at a very early date he carried out pioneer work on the commercial production of phosphorus, in which he was associated with the late Sir Richard Threlfall, F.R.S. During the First World War he served on the Panel of the Inventions Department of the Ministry of Munitions and was a member of the Board of Inventions and Research. He was also Chairman of the Nitrogen Products Committee, his services in this connection being recognised by the award of the C.B.E. in 1920. He was also Chairman of the Committee formed in 1914 to consider and report on the Severn Barrage Scheme.

Mr. Albright was a man of wide culture, a member of the Society of Friends, and had many and varied interests. He had a long association with public work in Oldbury, and served as an Alderman on the Worcestershire County Council from 1904 to 1944. He also served as Chairman of the Oldbury Council's Higher Education Committee and was a Governor of the Oldbury County High School, in which he took a great interest, his aim being to ensure that the scientific equipment of the School was both up-to-date and adequate. He provided the School, at his own expense, with many facilities including a modern swimming bath, and also shared with his brother, the late A. W. Albright, in founding the Albright Scholarships for pupils of that School. In 1889 he was appointed Justice of the Peace for Worcestershire, and he served as Chairman to the Oldbury Bench for 29 years. He was a Life Governor of Birmingham University. Mr. Albright was well-known in the Midlands for his interest in outdoor sport and was associated until his death with the Ledbury Hunt. His wife, Isabella Margaret, died in 1927 and his only son, the late Captain M. C. Albright, was killed in action in Palestine in 1917.

G. INGLIS.

ARTHUR JAMES COOPER.

1866—1944.

THE death of the Rev. Dr. A. J. Cooper which took place on December 6th, 1944, in his 79th year, will bring a sense of loss to his many friends and former pupils.

This able chemist, who came to theology from science, spent a long life in the service of education and was not only a scholar but a teacher of rare gifts. Educated at the King Edward VI Grammar School, Birmingham, he studied chemistry at the Mason College in that city under Professor William Tilden, F.R.S., and graduated B.Sc., London, being first in the first-class honour lists in chemistry, 1889. Later at Trinity College, Dublin, he graduated B.A. with first class honours and obtained the LL.D. He became successively Headmaster of Bromyard School, Principal of the Victoria Institute, Worcester, Principal of the Harris Institute, Preston, and Headmaster of Brewood School, Staffs. Whilst at Brewood he was ordained Deacon in 1901 and Priest in 1902 and then also acted as Curate of Brewood until his appointment to the Headmastership of Solihull School, Warwickshire, in 1908. His health during the latter part of his time at Solihull was poor and resulted in his premature retirement from the teaching profession in 1920. In 1921 he was appointed Rector of Maxstoke, Warwickshire, and resigned in 1925. He now joined the Department of Chemistry at the University of Birmingham as a research student and continued to be associated with research there until 1935, when he retired to Malvern. Cooper revelled in this period of research, for with him chemistry was an enthusiasm especially when it afforded him scope for the exercise of his exceptional proficiency in the laboratory arts.

In a long life he did many things well. A man of dignified appearance, yet with a fine sense of humour, Cooper was a most genial companion and, to those who knew him intimately, wonderfully kind and generous. With justification he might well have borrowed the words of F. H. Bradley, " The breadth of my life is not measured by the multitude of my pursuits nor the space I take up amongst other men ; but by the fulness of the whole life which I know as mine." The death of his wife after a long and very happily married life was a great blow to him and he survived her by only a short time. He leaves a son and a daughter.

W. WARDLAW.

DONALD PURDIE.

1909—1943.

DONALD PURDIE was born in 1909, the son of Mr. R. S. Purdie, the Headmaster of Hamond's School, Swaffham, Norfolk. After receiving his early education in his father's school, he went to Rugby, and in 1929 was elected to an Open Foundation Scholarship at King's College, Cambridge. Here he read for the Natural Sciences Tripos, and in 1932 obtained a First Class in Chemistry in Part II of the Tripos.

He was now free to devote himself to research, and initially worked under the direction of Dr. H. McCombie on the preparation of $\beta\beta'$-dichlorodiethylamine and $\beta\beta'\beta''$-trichlorotriethylamine from their respective ethanolamines. The reactions of these unstable chloroamines were investigated in detail, and their very great chemical interest made manifest.

In 1933 he joined the present writer as a research assistant, and began the long series of investigations upon organo-metallic derivatives which occupied him for over six years, *i.e.*, until the war brought such work to an end. The object of his first investigation was to obtain decisive evidence for the type of link by which molecules of amines, sulphides, phosphines, arsines, etc., are joined to metallic atoms in their so-called co-ordination compounds. The earlier optical resolution of tetrachloro-($\beta\beta'$-diaminodiethyl sulphide monohydrochloride)-platinum by Mann (*J.*, 1932, 958) had shown that the sulphur atom in this compound must be stereochemically closely akin to that in an optically active sulphoxide, but it did not show the precise nature of the covalent bond which linked the sulphur to the platinum. Purdie sought therefore to prepare a series of similar compounds which would be fusible without decomposition, and the surface tension of which could thus be accurately measured : it was hoped that the parachor of the compounds thus determined would indicate clearly the nature of the constituent links. Purdie prepared three homologous series of compounds, of general formula $[(R_2S)_2PdCl_2]$, $[(R_3P)_2PdCl_2]$, and $[(R_3As)_3PdCl_2]$ (where R represents a normal alkyl group), and found that all the members, with the exception of the methyl members, could be fused without decomposition : indeed, the phosphine compounds could readily be distilled under reduced pressure. When, however, the parachor of the palladium atom (together with that of the two " co-ordinate " links) was calculated from the difference between the molecular parachor and the total parachor of the other constituent atoms, it was found that this value was in each series unexpectedly low for the first (*i.e.*, the ethyl) member and rapidly fell as the homologous series was ascended, having a negative value for the *n*-butyl and *n*-amyl series. This phenomenon was not peculiar to these palladium compounds, for a similar result was obtained when the parachors of the mercury derivatives of the aliphatic thiols, $Hg(SR)_2$, were determined for each compound from the ethyl to the *n*-octyl member. The significance of these results was discussed at length (Mann and Purdie, *J.*, 1935, 1549) and it was shown that Sugden's earlier evidence for the " singlet " link in metallic derivatives of diketones, based on the mean parachor of only two members of a homologous series, could no longer be accepted. This " negative anomaly " of the parachor, shown by the palladium and mercury compounds, may prove of wide occurrence in organo-metallic derivatives : a similar phenomenon was later detected in certain metallic carbonyls and nitroso-derivatives by Anderson (*J.*, 1936, 1283). It is remarkable that the parachor, which is additive to a high degree of accuracy in purely covalent organic compounds, should show this striking anomaly in the organo-metallic derivatives, and no really satisfactory explanation of this phenomenon has yet been advanced.

In the course of this work, a novel series of " bridged " dipalladium compounds, of structure $[(R_3P)ClPdCl_2PdCl(PR_3)]$, was discovered : the structure of these compounds, and many of their very interesting reactions, were later studied in detail (Mann and Purdie, *J.*, 1936, 873) : this work incidentally gave evidence for the first time that the oxalate group can act as a symmetric 4-covalent group.

Whilst engaged in this work, Purdie had been elected to a Bye-Fellowship at Magdalene College. On the basis of this research, however, he was elected a Fellow of King's College in 1936, having proceeded to the degree of Ph.D. in the previous year.

The use of tertiary phosphines and arsines in the investigation of the structure of complex metallic derivatives proved very fruitful. The addition products of phosphines and arsines with cuprous, argentous, and aurous halides were next investigated. The cuprous and argentous derivatives were shown to be four-fold, $[R_3P,CuI]_4$ and $[R_3P,AgI]_4$, whilst the aurous compounds had the simple structure $[R_3P,AuI]$. With the crystallographic collaboration of Dr. A. F. Wells, the structures of both types of compound (four-fold and simple) were determined. The structure of the cuprous and argentous iodides was entirely novel in type, consisting of a tetrahedron having a metallic atom at each apex and an iodine atom situated above the centre of each face of the tetrahedron and covalently linked to each of the three neighbouring metallic atoms : finally the tetrahedral arsenic atoms lay on the projection of the axes of the tetrahedron, beyond the metallic atoms to which they were linked. This structure thus showed the configuration of the 4-covalent cuprous and argentous atoms, the 4-covalent arsenic atom, and the 3-covalent bromine atom (Mann, Purdie, and Wells, *J.*, 1936, 1053; 1937, 1828).

In the summer of 1936, Purdie was elected to a Commonwealth Fellowship and proceeded to Stanford University, where he spent two very happy years, and considerably enlarged his experience of both academic and chemical matters.

On his return to Cambridge in the autumn of 1938, Purdie resumed his collaboration with the present writer on the investigation of other complex metallic compounds. A number of compounds were prepared in which tertiary phosphines and arsines were linked to cadmium and mercuric halides, and the structure of several, both simple and bridged, was determined by *X*-ray analysis in collaboration with Dr. R. C. Evans and Mr. H. S. Peiser (*J.*, **1940**, 1209, 1230, 1235). In the mercury series, each of the four homologous compounds, of general formula $[R_3P(HgI_2)_nPR_3]$, where $n = 1$ to 4, was isolated and studied. A curious type of free radical became evident in this work. It was found that when alcoholic solutions of the two bridged compounds

$$[(Pr_3P)ICdI_2CdI(PPr_3)] \text{ and } [(Pr_3P)IHgI_2HgI(PPr_3)]$$

in equimolecular quantities were mixed, the highly crystalline cadmium–mercury derivative,

$$[(Pr_3P)ICdI_2HgI(PPr_3)],$$

separated. This reaction indicates that, although the first two compounds show normal molecular weights in organic solvents, they must exist in equilibrium with a small quantity of the free radicals $Pr_3P\rightarrow CdI$ and $Pr_3P\rightarrow HgI$ obtained by dissociation of the bridged parent compounds, and that it is these free radicals which combine to give the cadmium–mercury compound, which significantly is less soluble, and has a higher m. p., than the two bridged parent compounds. The aurous derivative of the phosphines, previously described, were also oxidised to the auric derivatives by the addition of both simple and mixed halogens, and a unique series of ten covalent triethylphosphineauric compounds thus prepared and investigated.

Purdie returned to America in 1939 to marry Miss Carol Mary Kearn-Brown, an American lady whom he had met during his earlier stay in the States. They came to England after only a brief honeymoon, and their married life was thus almost from the start under a heavy threat of war. When the war actually came, Purdie completed the investigation on hand, and then began an investigation on the preparation of 2-aryl-1-alkylindoles at the suggestion of the Advisory Research Committee of the Chemical Society. This investigation had shown considerable promise when in 1941 Purdie was elected to the Chair of Chemistry at Raffles College, Singapore.

Purdie, with his wife and young son, arrived safely at Singapore, where he found conditions, both personal and scientific, exceedingly pleasant. His letters sent to the present writer described his small but active school with great appreciation, and he obviously looked forward with keen anticipation to its development when times again became normal. Meanwhile he was reconciled to a period when progress must necessarily be slow owing to meagre supplies of apparatus and chemicals, and to the increasing preoccupation of the whole community with external affairs. The conditions at Singapore, which during his early months there appeared on the surface to be relatively tranquil, rapidly became more threatening, and Purdie joined the Singapore Supplementary Volunteer Force as a private. The sudden plunge into war, and the rapid advance of the Japanese army, must have caused Purdie a period of heart-breaking anxiety, as his second child was born just about this time. At the surrender of Singapore Purdie was taken prisoner, but his wife and family were successfully evacuated, and, in spite of the close attention which the Japanese bombers gave to ships laden with evacuated civilians, eventually reached Australia in safety and ultimately returned to Mrs. Purdie's earlier home in America.

Apparently during Purdie's first period of captivity the conditions were not too severe, for he was able with the help of other prisoners to organise some teaching in the prison camp at Changi in Singapore. Later, however, he was transferred to Thailand, where after a period of very great privation he collapsed and died of amœbic dysentery on May 27th, 1943.

Dr. R. J. W. Le Fèvre, who was on service in the Far East, writes (November, 1945) : " I am probably the last chemist now in England ever to see him. I well remember the Purdies in 1941—1942. On my arrival in Singapore they were the first family to entertain me, and both duty and pleasure brought me into contact with them many times later on. I have the pleasantest recollections of them in their very fine house situated near the Botanical Gardens, where they were my close neighbours for a few months. Purdie, as Professor of Chemistry in Raffles College, the nucleus of a future University of Singapore, had organised a Department of great promise in spacious and finely laid out buildings (the result of a world-wide architectural competition), and he was keenly looking forward to post-war years for the fruits of his efforts. He had, almost literally, on his doorstep a host of problems in natural organic chemistry. His untimely death is a loss to our subject in the Far East."

This loss is indeed great, for in Purdie a very fine intellect was combined, not only with marked manipulative skill, but also with a gay and wholly charming personality. One's deepest sympathy goes out to his young widow, who, courageously leaving the safety of her native land to come as a bride to England when the European war was almost certain, has had a married life so short and at times so critically anxious.

F. G. Mann.