wrote, *inter alia* : "I replied that I was prepared to give an immediate and decisive answer—that in my opinion the President of the Royal Society ought to be a distinguished man of science . . . that I would oppose any other nomination than that of a man of science". In the event, Lord Northampton was succeeded by William Parsons, third Earl of Rosse, and a distinguished amateur astronomer.

Peel died suddenly in 1850, and so did not witness the great events of 1851. In this year, on May 12, the new Museum of Practical Geology in Jermyn Street was opened by the Prince Consort ; and in the following November the Government School of Mines and of Science applied to the Arts (now the Royal School of Mines and the Royal College of Science) was opened in the same building, with Sir Henry de la Beche as its first president.

This was the climax of De la Beche's career. In 1853 his health began to deteriorate, although he continued to attend regularly at his office. Early in 1855 he was awarded the Wollaston Medal by the Geological Society ; but he was already confined to a wheel-chair by partial paralysis. He died on April 13 at the early age of fifty-nine, only two days after his last visit to the Museum. Sir John Flett, director of the Geological Survey during 1920–35, wrote of De la Beche in his centenary history of the Survey : "He had lived to see the fruition of his great designs, and to-day at South Kensington the Geological Survey and Museum and Royal School of Mines, housed in magnificent buildings, form a striking monument to his far-sighted policy and sound judgment. Nothing that he did has failed and with the progress of the years all his projected enterprises have expanded and developed".

[1] *Nature*, **143**, 254 (1939).

SIR JOHN BLAND-SUTTON, Bart. (1855–1936)

By W. R. BETT

A HUNDRED years ago, on April 21, 1855, at Enfield, Middlesex, was born John Bland Sutton, the eldest son of a market gardener, butcher and amateur medical practitioner, and later to become the most eminent pathologist-surgeon of his day and a great naturalist in the tradition of John Hunter, whom he worshipped. Like Hunter, he was brought up in the country, and like Hunter, he was proud of his humble origin and, indeed, also of his Cockney accent. At the age of ten he was taken to see Hunter's house in London, at Earl's Court, and the den in the garden where the menagerie of wild animals was kept ; and ever after, this great surgeon-naturalist remained his kindred spirit. Having worked for two years as a school-teacher, Sutton decided to become a surgeon and, like his hero, approached surgery through anatomy and comparative anatomy. After a preliminary grounding at Thomas Cooke's private school of anatomy in Bloomsbury, he entered the Middlesex Hospital Medical School in 1878 at the age of twenty-three, and while still a student was appointed prosector of anatomy, and in the following year junior demonstrator. Having no money to spend on sport and social diversions, he worked all day and far into the night. He was a popular teacher, whose witty demonstrations came to be known as 'Sutton's entertainments'. In 1882 he qualified as a medical practitioner, and two years later obtained the fellowship of the Royal College of Surgeons. In 1886 he was elected assistant surgeon to the Hospital and lecturer on anatomy in the Medical School.

Sutton's long and intimate connexion with the London Zoological Gardens began with his appointment in 1881 as prosector, and for five years he performed the post-mortem examinations on all the animals dying in the Gardens. Many of his findings formed the basis of his first book, "Ligaments : their Nature and Morphology" (1887), which revolutionized anatomy by explaining some of its anomalies in the light of morphology. In "Evolution and Disease" (1890) he attempted to show that there is a natural history of disease, as well as of plants and animals. Keenly interested in the problem of rickets in young lions at the Zoo, he fed them a diet of cod-liver oil, bone dust and infant's food, but this was not "a pecuniary success".

Around 1889 a Dr. J. B. Sutton opened a shilling dispensary in the Euston Road. As this was rumoured to be Bland Sutton's venture and he was frequently called out in the night for "cheap midwifery", he assumed the name of Bland-Sutton by deed poll.

A new chapter in Bland-Sutton's life started in 1896 when he was elected surgeon to the Chelsea Hospital for Women, which he rapidly made the Mecca for pelvic surgeons from all over the world, for he created the gynæcological surgeon in place of the gynæcologist. When he first performed hysterectomies for fibroids he was called "a criminal mutilator of women" ; but he was later hailed as a pioneer who disestablished the "couch-invalid", rendering her capable of earning her own living or becoming a companion to her husband. He made a fortune out of hysterectomies and for a time appeared to lose interest in general surgery. He was the first to remove a tubal mole, which he made a familiar condition to the gynæcologist, and his papers on the origin of ovarian cysts in animals, on ovarian dermoids and on menstruation in monkeys were classics in their day.

For many years regarded as the surgeon to the dental surgeons, Bland-Sutton was an honorary member of the Odontological Society, before which he read valuable papers on comparative dental pathology, and to him we owe the first scientific classification of odontomes. His book "Tumours, Innocent and Malignant" (1893, seventh edition 1922) was a 'best-seller' and won him world-wide fame. It was so copiously and so dramatically illustrated as to make the text seem almost superfluous ; the author had no use for photographs, and rendered a great service to medicine and to literature by resuscitating the art of wood-engraving. A fluent and attractive writer and speaker, he was forceful, witty and adept in producing unexpected similes.

A knighthood was conferred on Bland-Sutton in 1912, which was followed by a baronetcy in 1925, and he served as president of the Royal College of Surgeons of England during 1923–26. He had now reached the summit of his surgical career and fame and of his ambition. As an operator he was incredibly quick and used the minimum of instruments. In profile he bore a marked resemblance to Napoleon, and he had many Napoleonic traits in his mental make-up, such as self-reliance, ambition, natural leadership of men, coolness in a crisis, and aloofness of personality. His beautiful dining-court in Brook Street, an exact replica in miniature of the hall of honour in the

palace of Darius the Great at Susa, was one of the sights of London and the frequent scene of lavish dinners, which were attended by the greatest men and women in the land.

Bland-Sutton was a keen traveller and made some fifty voyages to various parts of the world, which he described in memorable books and essays, such as "Man and Beast in Eastern Ethiopia", "Spolia Nemoralia" (an account of the shrunk heads of the Aguaruna Indians), and "The Science of the Bull-ring". He retired from the Middlesex Hospital in 1920 and died on December 20, 1936, at the age of eighty-one. When he started on his career, the path to surgery lay through the dissecting room. Foreseeing "the need of a more intimate association between the care of living patients and the study of disease" and anticipating the day when the path to surgery would lie through the pathological institute, in 1913 he presented to the Middlesex Hospital the Bland-Sutton Institute of Pathology. It is fitting that his ashes rest in the museum of this Institute, near his marble bust by Sir George Frampton: "A Seeker after Knowledge that should Avert or Mitigate Pain".

THE PROPERTIES OF SOLID ARGON

A MEETING of the Low Temperature Group of the Physical Society, held on February 8, was devoted to the properties of solid argon. Dr. K. Mendelssohn presided, and in his opening remarks emphasized that the simplicity of the atomic structure of the inert gases makes them valuable instruments for the exploration of the general physical properties of matter.

Prof. G. O. Jones mentioned briefly some researches into the properties of solid argon in progress at Queen Mary College (University of London), and described in detail work being carried out by Mr. B. F. Figgins on the specific heat of solidified argon–krypton mixtures of simple atomic proportions (1 : 1 and 1 : 3). Argon and krypton are known to form solid solutions over the whole range of composition at temperatures somewhat below their melting points, and it is of interest to inquire whether at sufficiently low temperatures separation into two phases occurs or whether (for mixtures of these simple proportions) a super-lattice might be formed. If the energy w gained in mixing an AB pair, equal to $w_{AB} - \frac{1}{2}(w_{AA} + w_{BB})$ in the usual notation, is positive, separation into phases would be expected. If w is negative a super-lattice could be formed. Examination of this system might therefore provide sensitive information about the interatomic potential functions for argon and krypton.

In order to obtain an estimate of the temperature at which two phases or a super-lattice might appear, we may consider the van der Waals attractive potential only and neglect differences of size. The polarizability is then the chief factor of difference between A and B, and w_{AB} would be approximately equal to $\sqrt{w_{AA}w_{BB}}$ so that $w > 0$. The same conclusion follows from the results of detailed calculations due to R. A. Buckingham. We should not expect it to be modified if the repulsive potential were taken into account, so that separation into phases would appear to be favoured. (Differences of size would presumably be expected to favour separation into phases as opposed to the formation of a super-lattice.) Making use of the known heats of sublimation, we estimate that w might be about 40 cal./mole, so that separation into phases might be expected somewhere between 10° and 40° K.

Careful measurement of the specific heat of the 1 : 1 mixture between 10° and 90° K. shows no discontinuity of any kind. The values lie intermediate between those reported by Clusius for pure solid argon and krypton respectively, but slightly above the mean values corresponding to any temperature. A redetermination of the values for the pure elements by Mr. Figgins now in progress suggests that C_p for the 1 : 1 mixture is equal to the mean of its values for argon and krypton within the limits of experimental error. Thus there appears to be no contribution to C_p from the disordering process, either in one or two phases. It is hoped that further information as to the state of order of the system will shortly be obtained by the use of X-rays. Meanwhile, it is of interest that Mr. R. Heastie (of Queen Mary College) has observed a positive deviation from ideality for solid solutions of argon and krypton, because such behaviour implies, for regular solutions, that w is greater than zero.

Prof. C. Domb gave a critical review of the methods of deriving information about intermolecular forces. There are three main sources of information: theoretical, gas data and solid-state data. Theory could provide a qualitative description of the form of the intermolecular potentials. At large distances the van der Waals attraction is represented by a series $-a/r^6 - b/r^8 - c/r^{10} \ldots$ (Casimir and Polder have indicated[1] that the series should start with $1/r^7$, but the matter is not completely clarified.) At short distances the repulsive force is of the form $P(r)\exp(-\alpha r)$, where $P(r)$ is a polynomial. Detailed calculations are very complicated, however, and even for the simplest substance, helium, it is likely that estimates based on experimental data are more reliable than the famous Slater–Kirkwood potential[2].

In regard to the gaseous state, it is customary to make use of the second virial coefficient and transport properties. While the information thereby provided is valuable, it is not sufficient to determine the precise form of the intermolecular potential, and the repulsive portion is particularly uncertain.

More extensive information is provided by data on the solid state. The sublimation energy and equilibrium volume at the absolute zero are sufficient to dispose of two parameters in any proposed formula for intermolecular potentials. Further information is now becoming available as a result of the accurate measurements of elastic constants at Queen Mary College, and the accurate determination of Debye Θ values at low temperatures by R. W. Hill at Oxford. A recent series of measurements by Dr. C. A. Swenson at the Massachusetts Institute of Technology giving solid-state isotherms at pressures up to 4,000 atmospheres (I am indebted to Sir Francis Simon for providing me with these data) seems to open up the possibility of accurate information on the repulsive part of the intermolecular potential (these have recently been published: Stewart, J. W., *Phys. Rev.*, **97**, 578; 1955); this is being investigated by I. J. Zucker at King's College, London. Finally, the melting curve data at high pressures obtained at Oxford by Robinson and Simon clearly contain information about the repulsive potentials; but this can only be extracted if the Lindemann melting formula or some equivalent can be reliably established for high pressures.