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THE X-CLUB
A SOCIAL NETWORK OF SCIENCE IN
LATE-VICTORIAN ENGLAND

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AMONG the more significant features of nineteenth-century British science was the emergence of social and professional networks which helped to shape or influence the course of scientific activity. By and large, the most conspicuous arbiters of scientific values were the learned societies, the British Association and the universities. These formal bodies, however, almost always reflected the attitudes and assumptions of small, informal, often obscure and sometimes anonymous, clusters or networks of individuals. Until recently, most of these groups have been overlooked or neglected (1), but growing interest in the social history of science has stimulated fresh research into the history of scientific societies generally, and into scientific *élites* in particular. The 'X-Club', recalled by the contemporary American historian, John Fiske, as 'the most powerful and influential scientific coterie in England' (2), was one of the most important and instructive of these groups. The following pages will inquire into the origins, the development, and the probable significance of this 'coterie' in the social climate of late-Victorian science.

It is well known that clubs for discussion over dinner and port wine have played an important part in the development of scientific life in Britain (3). Many existing professional or semi-professional associations and scientific bodies began as dining clubs, several during the so-called 'Age of Clubs' of the late eighteenth century. Reflecting a spontaneous desire by men of similar tastes and interests to meet colleagues and friends socially, 'to prove their title to good fellowship' (4), the informal club became the accepted social context for the exchange of new information and ideas, literary, political and scientific.

The importance of these social functions did not disappear, when, with the passage of years, informal fraternities matured into formal societies. But formal institutions did not always provide the environments in which leading men of science could count on both a 'feast of reason and a flow of soul' (5). Moreover, friendships and rivalries within the scientific 'com-

munity' rendered large, infrequent and conventional scientific meetings inappropriate for the discussion of confidential matters affecting the conduct and reward of scientific work, and the reform of scientific institutions.

In response to these different needs, several informal, or at least 'unofficial', groups were created. Among them were the Philosophical Club begun in 1897 as a 'ginger group' seeking reform within the Royal Society. At the opposite extreme was the Red Lion Club, founded by Edward Forbes, at the British Association meeting in Birmingham in 1839 as a 'protest against dons and donnishness in science' (6). As one participant recalled, the Red Lions held feasts of 'spartan simplicity and anarchic constitution, with rites of Pantagruelistic aspect, intermingles with extremely unconventional orations, and queer songs . . . by way of counterblast to the official banquets of the British Association . . .' (7). To some distinguished foreign visitors, the sight of grave English professors waving and wagging their coat tails by way of applause, was, at best, an unusual experience. The Red Lions carried on intermittently until the First World War. But this form of gathering tended to degenerate into mere socializing. It lacked the dimension of serious professional discourse that some men of science felt necessary.

A more serious and more specialized attempt to create this dimension was made by a group of chemists about 1865. This group formed the 'B-Club' from Section B (Chemistry) of the British Association in the belief that 'there were other ways of promoting the welfare of chemical science than those contemplated by the more formal society' (8). The 'hives of B's' as they called themselves, met once a month during the London season, and combined specifically chemical gossip with friendly sessions of poetry and word-play. But neither the Red Lions, nor more specialized professional clubs were sufficiently intimate to satisfy the small group of men who became known as the 'Young Guard' of Victorian science.

At the Cheltenham meeting of the British Association in 1856, Joseph (later Sir Joseph) Hooker (1817-1911), Director of Kew Gardens, met young Thomas Huxley (1825-1895) and urged him to help enlist botanists and zoologists to 'discuss some plan that would bring about more unity in our efforts to advance science' (9). 'As I get more and more engrossed at Kew', Hooker continued, 'I feel the want of association with my brother Naturalists, especially of such men as you, Busk, Henfrey and Carpenter.

We never meet except by pure accident, and seldom then as naturalists, and if we want to introduce a mutual friend, it is only by cut and thrust into one another's business hours. It is the same with our publications . . .

Without some recognised place of resort that will fulfill the conditions

of being a rendezvous for ourselves, an inducement to our friends to take an interest in Natural History, and at the same time a profitable intellectual resort—we shall be always ignorant of one another's whereabouts and writings' (10).

The Red Lions, 'admitting the rag-tag and bobtail of literature and the Arts, together with the dregs of scientific society' could never meet Hooker's conditions. 'We want some place where we should never be disappointed of finding someone or something worth going out for' (11).

Huxley agreed. 'Otherwise', he wrote anxiously to Hooker, 'I wonder if we are ever to meet again in this world' (12). Huxley himself provided the answer. In January 1864, he suggested a regular meeting to unite his closest friends (13). After preliminary discussions, a dinner was held on Thursday, 3 November 1864, at St George's Hotel, Albemarle Street, to launch the new enterprise. On 7 November, Herbert Spencer reported the event to his father:

In pursuance of a long-suspended intention, a few of the most advanced men of science have united to form a small club to dine together occasionally. It consists of Huxley, Frankland, Tyndall and Hooker, Lubbock, Busk, Hirst and myself. Two more will probably be admitted, but the number will be limited to ten (14).

'There is no knowing', Hirst wrote in his diary, 'into what this club, which counts amongst its members some of the best workers of the day, may grow . . .' (15). Certainly, this November evening brought together a group who would, for nearly a quarter of a century, wield far-reaching influence on the style and conduct of English science.

They were first of all, friends of long standing. Edward (later Sir Edward) Frankland (1825-1899) met John Tyndall (1820-1893) at Queenswood College, Hampshire, about 1847, soon after Tyndall began teaching mathematics and surveying. Both left for Germany in 1848 to study with Bunsen at Marburg and at Berlin, and both received Ph.D. degrees there. Frankland returned in 1850 to take up Playfair's chair at Putney College, and then went to the first chemistry chair at the new Owen's College in Manchester in 1851. Tyndall returned briefly to Queenswood, and then moved to the Royal Institution in 1853. In 1858, frustrated by repressive conditions in Manchester, Frankland moved to London and to a post at St Bartholomew's Hospital. In 1863, with Tyndall's help, he moved to the Royal Institution, where he spent the next six years—'the happiest in my life', he later recalled (16).

Thomas Archer Hirst (1830-1892) met Tyndall in 1846, when both were boys articled to Richard Carter, a land agent and surveyor of Halifax in West

Yorkshire. Hirst followed Tyndall to Marburg in 1849, took his Ph.D., and completed his education with Gauss and Weber at Göttingen, and with Jacob Steiner at Berlin. In 1853, he briefly succeeded Tyndall at Queenswood College, and in 1860 became maths master at University College School in London. In 1865, he was made professor of physics at University College, and in 1867, on the death of De Morgan, succeeded him as professor of pure mathematics (17).

Tyndall and Huxley met at the Ipswich meeting of the British Association in 1851, and Hooker joined their circle in 1857. Spencer met Huxley at the British Association in 1852. Through Huxley he met Tyndall in 1853. Around 1861 Spencer became acquainted with George Busk (1807-1886) and his wife, and soon became a close friend of the family. Busk, a surgeon by profession, had been the first naturalist to encourage Huxley on his return from the *Rattlesnake* Expedition in 1850. Busk was quiet and reserved, and much less well known to the outside world than to the scientific societies in which he participated. Mrs Busk was remembered as being 'scientifically cultivated in a degree rare among ladies'. It was through the Busks that, in 1862, Spencer met Sir John Lubbock (1834-1913). Lubbock had been a friend of Huxley since 1856, when Huxley had encouraged him to stand for the Royal Society, and helped to secure his election (18). Lubbock, in turn, met Hooker in the Botanic Garden at Oxford, during the British Association meeting of 1860 (19).

Initially, therefore, the eight came together from three 'sets' of friends—those of Huxley, Spencer and Tyndall. The eight had much in common. All but Lubbock were of middle-class origin. All were 'of one mind on theological topics' (20), and, in Leonard Huxley's phrase, 'animated by similar ideas of the high function of science in this country'. In 1864, all but Lubbock lived and worked in London, and Lubbock's home at Lamas, in Chislehurst, was not far away. Frankland, Tyndall and Huxley taught at the Royal Institution; Spencer, after 1866, lived near Lancaster Gate. Hirst lived in Marylebone, and Hooker at Kew.

All, except Lubbock and Busk, were approaching middle age and had comparatively recently made their mark in the scientific world. In 1864, Lubbock, the youngest, was thirty; Hirst was 34; Frankland and Huxley were 39, and Spencer and Tyndall were 44. Hooker was 47, and Busk the oldest was 57. With the exception of Hooker and Spencer, the eight were among the 'new men elected to the Royal Society under the revised statutes of 1847. Hooker became an F.R.S. in 1847, Busk in 1850, Huxley in 1851, Tyndall in 1852, Frankland in 1853, Lubbock in 1858 and Hirst in 1861. Hooker had been one of the original members of the Philosophical

Club with Bowman and Grove. Huxley and Tyndall became members in 1855, and Busk, Treasurer in 1863. But they and the rest were, in 1864, still outside the Royal Society establishment.

Of the eight who attended the first dinner, only three represented the physical sciences. It was logical that the next member should come from the physical sciences as well, and the following month William Spottiswoode (1825-1883), mathematician and friend of Tyndall, was elected (21). Spottiswoode was the same age as Huxley and Frankland, and was, like Frankland, elected to the Royal Society in 1853. A tenth member was considered but for some reason never appointed. As Spencer later recalled, no one was found who fulfilled the two requirements—that he should be of adequate mental calibre and that he should be on terms of intimacy with the existing members. ‘These meetings after all, were intended to be social gatherings of friends.’ Eventually the subject of a tenth member was dropped (22).

At the first dinner it was agreed to meet subsequently on the first Thursday of each month except during July, August and September. Thursday was chosen because it was the day of the Royal Society meeting when all would normally be ‘up in town’. Dinner began at six, so as to finish in time for the Royal Society at 8.00 (23). By stages, their dinners moved from Albemarle Street to Almond’s Hotel, Clifford Street, and after Spottiswoode’s death in 1886, to the Athenaeum, where all remaining eight were members (24).

The Club, according to Spencer, had no rules, except to have none. Each member held in turn the offices of secretary and treasurer, with the duty of collecting accounts, sending notes of meetings, and, according to Frankland, keeping rough notes of all proceedings (25). The question whether formal minutes should be taken was apparently considered, but ultimately abandoned. In November 1885, a resolution ordering the Treasurer to keep regular notes was defeated, when Tyndall pointed out that such a rule would violate the agreement against having rules of any kind (26). Informal notes, however, were kept of several meetings by Thomas Hirst, with assistance from Huxley, Hooker and Tyndall. The first eight of these appear in Frankland’s biography, but the notebooks themselves have recently been discovered among the Tyndall papers at the Royal Institution (27).

Soon arose the question of a name. Several alternatives were suggested—the ‘Thorough Club’ was one; the ‘Blastodermic’, referring to the part of the ovum where the rudiments of animal organization first appear, was another. In the end, Spencer recalls, Mrs Busk suggested they end the matter by calling themselves the ‘X-Club’. All approved. ‘Beyond

the advantage that it committed us to nothing' (28), as Spencer said, this name could secretly give notice of meetings by use of postcards bearing the notation 'X=6', or whatever date the first Thursday of the month fell upon. In a more romantic vein, Cyril Bibby believes the 'X' stood in triple symbolism—for the undecided name of the Club, for the originally envisaged ten members and for the undetermined tenth who was never chosen (29).

Between 1865 and 1880 the Club enjoyed its most exciting phase—particularly during 1870–1878, when Hooker (P.R.S.), Huxley (Sec. R.S.) and Spottiswoode (Treas. R.S.) all held office in the Royal Society at the same time. During these years the members of the X-Club also began to win their first scientific awards. In the course of the next twenty years, the nine earned five Royal Medals, three Copley Medals, one Rumford Medal, two Darwin Medals, and one Lyell and one Wollaston Medal from the Geological Society. Among them they received eighteen honorary doctorates, one Order of Merit, and one Prussian 'Pour la Mérite'. Two received knighthoods, one became a Privy Councillor and one a Justice of the Peace. Three became Corresponding Members and one a Foreign Associate of the Académie des Sciences (30).

The social importance of the Club equalled its scientific eminence. It was perhaps an 'Albemarle Street Conspiracy', boasting considerable practical experience of research, considerable experience of foreign lands, and certain fixed ideas about the place of science in society. Hooker (1873–1878), Spottiswoode (1878–1883) and Huxley (1883–1885) successively held the Presidency of the Royal Society. Spottiswoode was Treasurer between 1870 and 1878, Huxley became Senior Secretary between 1872 and 1881, and Frankland was Foreign Secretary between 1895 and 1899. Hirst was on the Council between 1864–1866, 1871–1873 and 1880–1882.

Their influence outside the Royal Society was equally pronounced. Five of the nine became Presidents of the British Association (31). Busk took an influential role in the Royal College of Surgeons, successively as member of Council (1865), Examiner (1868), and President (1871). Hirst became President of the London Mathematical Society (1872–1874) and Frankland, President of the Chemical Society (1871–1873).

The Club had not begun with any formal purpose, although there seems to have been a vague intention to discuss scientific and philosophical questions. Spencer recalled 'that much time was spent chiefly in lively talk, of which *badinage* formed a considerable element' (32). In May 1866, for example, the 'X' nicknamed each other, sometimes with greater accuracy than kindness. Thus we find the Xquisite Lubbock, and the Xcellent Spottiswoode, the Xperienced Hooker, the Xalted Huxley, the Xcentric

Tyndall, the Xemplary Busk, the Xpert Frankland, the Xtravagant Hirst, and the Xhaustive Spencer (33). But 'besides personal friendship', recalled Hirst, 'the bond that united us was devotion to science, pure and free, untrammelled by religious dogmas. Amongst ourselves there is perfect outspokenness, and no doubt opportunities will arise when concerted action on our part may be of service' (34). In this cordial atmosphere, controversies on science and religion and the views of Bishop Colenso waged freely between discussions on atomic structure and the merits of Bacon as the originator of inductive method (35).

Similarly, it was appropriate for the nine to rally round and encourage one another professionally, as in 1866 when together they subscribed to 250 copies of Spencer's *System of Philosophy* to save their colleague from financial embarrassment (36). Again, in 1866, Hooker successfully interceded in a dispute between Tyndall and Francis Palgrave at the *Saturday Review*. Tyndall, he assured Palgrave, was 'so stirring and amicable, and his faults are so positively heart-affections, that I never can bear to see him hurt and got the better of without the strongest sympathy and wish to resent' (37).

Inevitably, conversation also turned to social issues of science. It was only natural, for example, that at their first meeting in 1864, when the weekly *Reader* was about to change hands, the importance of a lasting scientific newspaper and journal should concern the Club, and that its members should support the efforts of Tyndall and Huxley which ultimately brought *Nature* into being (38) likewise, it was expected that E. L. Youmans, the American publishing entrepreneur, would visit the 'X' to win its help in arranging American editions of English scientific works.

The brief descriptions we have of the Club's early meetings are tantalizing. In October 1865, the X 'suggested' the ballot for the forthcoming Royal Society Council elections, and Lubbock put forward a scheme to endow a Christie Lectureship at the Royal Institution. In November 1865, the group discussed the advisability of Tyndall's accepting a chair at Oxford, and the unsatisfactory method of nominating officers of the Royal Society. In December Spottiswoode recorded discussions on the strength of the liberal 'Reform Party' at Oxford. Meetings between 1866 and 1868 discussed the relationship between Faraday and Davy, the possibility of speeding publication of the *Philosophical Transactions*, the Duke of Argyll's theory of valleys, and the annual appointment of sectional presidents for the British Association. In June 1867, the 'X' voted to support Lubbock's candidature for Parliament. On other occasions, the Club discussed whether the Royal Society was justified in urging the Board of Trade to inspect ships' compasses (April 1868), and whether Lubbock's name should be added to the

British Association Committee on Scientific Education (January 1869). Other sessions discussed Sir George Airy's suitability for the Presidency of the Royal Society (January 1870), Tyndall's work on 'dirt and disease' (1874), and the creation of a Science Museum (1877). With such events as the impending transfer of the British Museum's scientific section to South Kensington and Huxley's election to the London School Board (November 1870), the nomination of officers for the major learned societies, and the adjudication of pension and medal claims, the dinners must certainly have assumed political importance. At one point (March 1871) Spencer is noted to have 'protested against the transaction of so much business' (39). But it is most unlikely that his protest was heeded.

It was never intended for the Club's discussions to become public, but Spencer, at least, believed they had a significant public effect. 'In course of time the existence of the Club became known in the scientific world, and it was, we heard, spoken of with bated breath—was indeed, I believe, supposed to exercise more power than it did' (40). Huxley recalled overhearing two members of the Athenaeum speaking one day: 'I say, do you know anything about the "X-Club"?' 'Why—I have heard of it.' 'What do they do?' 'Well, they govern scientific affairs, and really, on the whole, they don't do it badly' (41). The self-possessed but unassuming manner in which the X-Club considered major items was certainly disarming. Thus Tyndall wrote to Hirst in late 1876:

We had our X meeting on Thursday last . . .

We had a good deal of talk about the disposal of the £4,000 which the Government had placed in the hands of the Royal Society. A good deal of heart burning is likely to flow from this same gift. It is not one into the need of which we have fairly and naturally flowed, so that it will have to be managed instead of healthily assimilated. Spencer, as usual, was laying down the law with an *a priori* definiteness, but was by no means left at peace with his conclusion (42).

The myth of the X-Club's pervasive influence was enhanced by the galaxy of eminent public and scientific 'men of mark' invited to its monthly dinners (43). Such men included W. K. Clifford, the mathematician, Charles Darwin, David Masson (Professor of English at University College and sometime editor of the *Reader*), and Robert Lowe, Chancellor of the Exchequer. Distinguished foreigners included Auguste Laugel, Helmholtz and Cornu from the Continent; and Asa Gray, Louis Aggasiz and E. L. Youmans from America. The X-Club almost naturally became a powerful instrument for wielding scientific opinion in winning political battles. Thus,

in 1872-1873, Huxley, Tyndall, Frankland and Busk, working jointly through Lubbock in the House of Commons, rallied to the support of Hooker in his administrative contest with Acton Ayrton, Gladstone's temperamental First Commissioner of Works. In the same year, the good offices of Huxley and Spottiswoode were clearly seen in Hirst's appointment in 1873 to the Directorship of Naval Studies at the Royal Naval College (44), by the new Chancellor and guest of the X-Club, G. J. Goschen.

For a time, the X-Club succeeded in combining scientific discussion with domestic holidays. Every year, in June, the Club held its monthly meeting on a Saturday, and scheduled week-end outings in the country (45). On these occasions wives were invited, and postcard announcements were addressed to 'X's and Yv's' (46). Each year about fifteen assembled for drives or walking expeditions, often to Maidenhead, but also to Windsor Forest, or to Leith Hill, Oxford, where they could listen to Huxley reading Tennyson (47).

After 1874, however, these country meetings became less frequent. 'Several motives'—probably including the deaths, within the space of a few months, of Hooker's first wife, Frances, and Frankland's first wife, Sophie—brought these happy occasions to an end (48). The end of June excursions, however, did not mean the end of all domestic gatherings. On occasions when a member of the Club presided at the British Association—such as at Liverpool in 1870 when Huxley was President, at Dublin in 1878 when Spottiswoode was President, and at York in 1887, when Lubbock presided—the members and their wives took a suite of rooms at the chief hotel and, in Spencer's phrase, 'united their forces' (49). Safety in numbers was perhaps a consideration when, as after Tyndall's presidential address at Belfast in 1874, the gales of controversy blew with special force (50).

In January 1876 the 'X' celebrated its 100th meeting and the Club entered a new phase of development. Its members had by now acceded to positions of power in the scientific community. But while its outward appearance grew more impressive, its internal harmony was repeatedly disturbed. Some arguments were generated by the deaths of members, and the question of whether to elect new ones. In 1883, Spottiswoode, the last to join, was the first to die, from typhoid, at his London home. 'The fact is', Spencer wrote to Youmans, 'we are all beginning to break up in one way or another. Of the members, one is going and of the remaining eight, only two are in good health' (51). In October, 1885, Huxley mourned that only Frankland and Lubbock were in sufficiently good spirits to attend (52). In 1888, Lubbock and Frankland urged the election of two new members and mentioned General Strachey, Michael Foster, John Evans and Francis

Galton. Hooker was neutral; 'I am not anxious for recruits to the "X" but do not want to sit alone at the table' (53), he wrote. Huxley indicated his general support for new elections, but Tyndall strongly opposed them. His decision was not on personal grounds; Galton, had long shared Tyndall's love of mountaineering (54) and both Strachey and Foster were friends. Perhaps Tyndall felt nostalgically that the election of new men would give formal recognition to the swift passage of time, and change the character of the group. 'In the end', Hirst wrote, 'the subject was deferred, although there were feelings that because Tyndall had not recently attended meetings he ought not to count' (55). According to Huxley, it was agreed to limit new members to those whose names contained all the consonants absent from the names of the old members. Since, as the story goes, they had no Slavonic friends, there was an end to it (56). The more one learns about the X-Club, the less apocryphal this explanation seems.

But the heat generated by the question of new members was mild compared to the bitterness the Club experienced in the 1880s over Gladstone's posture in Egypt, and the death of Gordon at Khartoum. The frustrations of public affairs exploded round the dinner table. As Huxley wrote to Professor Bartholomew Price at Oxford in May: 'The X-Club is going to Smithereens, as if a charge of dynamite had been exploded in the middle of it' (57). In September, Tyndall remarked to Hirst that 'the Table Round of the X will, I fear never meet again in its pristine vigour' (58). In December 1885, a month after his release from the duties of President of the Royal Society, Huxley himself railed against 'politics, scandal and the three classes of witnesses—lairs, d—d liars and experts' (59). In 1887, emotions were roused again by the spectacle of Stokes standing for Parliament and by the break-up of the Liberal Party. At the November dinner, it was decided to draw up and sign a kind of 'scientific declaration' in support of the Union, and Tyndall was deputed to write it in strong but moderate language. 'It was thought that nearly every scientist of note would sign it' (60). Many, in fact, did so, and the Club (excepting Lubbock) became a notable outpost of opposition to Gladstone, and support to Derby and Salisbury.

In the absence of new ideas or fresh members personal rifts were predictable. As late as 1885, Huxley and Spencer were good friends, bantering each other in playful prose. Thus, when Spencer missed a dinner, Huxley consoled him:

We were very sorry to miss you yesterday—were reduced to five; but we contrived to keep our spirits up and positively sat till after ten o'clock—all except Lubbock, who had to go to the Linnaean. I don't think that

anything of a profound character was said—in fact, in your absence, I am afraid we inclined to frivolity.

and Spencer promptly replied:

And so you sat till 10. Well, really this is too bad. Considering that I am always the one to protest about the early dissolutions that habitually take place, that you should seize the occasion of my absence for making a night of it adding insult to injury. It would really seem from the fact that you deliberately bring before me that I have hitherto been the cause of the prompt breaking up of the party! I shall have to bring the question before the next X, and ask what it is in my behaviour which leads to this obvious anxiety to get away as soon as possible when I am present (61).

Four years later, however, an almost accidental dispute over the philosophical justifications for a land nationalization policy drove Huxley and Spencer into angry and opposite camps. Their private differences, boiling over into the pages of the *Nineteenth Century*, caused grave concern in the 'X'. Mutual friends tried to heal the wound, but their advice seemed only to annoy Spencer even more. Instead of meeting Huxley's attempts at compromise, Spencer withdrew from society and sulked. He even prepared a letter of resignation from the Club, which only Hooker, with the greatest difficulty, persuaded him to withdraw. Tyndall urged Spencer to meet Huxley and sort out their difficulties amicably: 'You may well believe that this newspaper controversy has been a source of mourning to my wife and me. Many a time since it began have I wished to be at your side, or better still, to have you and Huxley face to face. With a little tact and moderation, the differences between you—if a difference exist at all—might have been easily arranged' (62). To Tyndall, Spencer merely replied:

Doubtless you and others of the Club do not fully understand the state of mind produced in me . . . The effect on me had been such that the thoughts and irritations have been going round in my brain day and night as in a mill, without the possibility of stopping them (63).

It was not until the end of 1893 that cordial relations were restored.

In the meantime separation and advancing age were contributing to the Club's gradual decline. After 1886, Spencer's failing health and his rest cures at Bournemouth led him frequently to miss dinners and to decline his friends (64). In May 1886, only Hooker and Frankland attended (65), and by June, Huxley felt the Club was wasting away. 'We really must make up our minds', he told Lubbock, 'what is to be done for the future' (66). Spencer's declining health reflected the 'Table Round's' declining fortunes (67). In

1889, Hooker rebuked Tyndall for not coming: 'There were Hirst, Frankland and Lubbock. Poor Spencer, looking the ghost of misery, dined apart' (68).

Gradually the group moved from London; Hooker to Sunningdale, Lubbock to High Elms in Kent, Tyndall to Hindhead in the Lake District, Huxley to Eastbourne in 1890, Spencer to Brighton in 1898, and Frankland to Reigate in 1885 (69). Busk's death in 1886 (70) was followed by Hirst's long illness and death in 1892. In early 1892, Hooker wrote to Tyndall:

I cannot get over the loss of Hirst . . . in respect of the X meetings . . . How I wish you could return to us; except to meet Huxley I care now very little about it. This is blasphemy, but if it is so, so it is (71).

Tyndall wept with grief to Huxley:

He is gone, and the loss to all of us is great—to me especially. We have been intimate with each other for more than five and forty years and without a moment's chill to our affections. To me his life was almost more or less of a tragedy. I know his intellectual power to be great, but I saw that power perpetually broken by imperfect health (72).

In April, Hooker wrote again to Tyndall, in even gloomier terms:

I fear the poor X is on its last legs. Frankland is the only dependable attendant. Spencer is always ill, or thinks he is, and that is as bad; Huxley lives too far off and it is always a toss up as to whether Lubbock can and will come . . . (73).

Petty annoyances acquired undue importance, until the Club's difficulties seemed to outweigh its advantages. The last entries in the X-Club Notebook were made on 10 March 1892. To Huxley, Hooker wrote in April 1892, that the 'amount of correspondence for every meeting held, indicates the feeble hold it has on its members; in most cases, of necessity, but in such a case as Lubbock's, mere convenience'. His doubts gathered force with time: 'I am coming to the conclusion that at our age these clubs are an anachronism . . . as I have said all along, they were made for younger men and younger men should settle their future' (74). In May, he exploded:

I have lost all patience with the X Club. It is an incessant bombardment of summonses without response, or unsatisfactory ones, previous to every date of meeting. You are the only one who has answered the last, and as I greatly fear you may not be able to attend, I am writing to the others to put off the 2nd (*sub voce*) *sine die*. The truth is that, except Frankland,

we are all crippled by circumstances of health, distress or in Lubbock's case, of other demands.

My idea is that it is best to let it die out unobserved, and say nothing about its decease to anyone (75).

The experience of the meeting of April 1892, seemed to confirm his worst predictions. 'The last X two months ago was a fiasco. Only Frankland came, and he left at 8 p.m.' (76). Tyndall agreed: 'The X has gone to pieces by spontaneous fission' (77).

In the meantime, Britain was fast becoming a different place from that which the young X-Club had known. 'What a state of the world we are living in,' wrote Spencer to Tyndall in January 1893, 'with its socialist anarchism, and all kinds of wild ideas and destructive actions. The prophecies I have been making from time to time ever since 1860 as to the results of giving to men political power without importuning to them equal political burdens, are becoming true far faster than I had anticipated' (78). By March 1893, Hooker wished to concede defeat. Out of six meetings during the past session, Hirst attended four, Huxley two, Hooker five, Spencer three, Lubbock two, Frankland five and Tyndall none. Hooker wrote:

Frankland and I were alone at the last meeting, and he had to leave early. Neither Lubbock nor Spencer are to be depended upon—nor can you or I well be frequent attendants at stated intervals. If Hirst had survived, I would have stuck by him to the last battle, but I feel that with him gone and you away, the spell is broken. Tyndall's revivication could help matters, and he, poor fellow, is only another fallen leaf from the once goodly tree (79).

Their meeting of March 1893, was to be the X-Club's last.

To Lubbock Spencer wrote in May 1893: 'I fear that now the X is dead there is but little chance of our meeting . . . I wish it were otherwise (80)'. In December 1893, Tyndall died tragically from an overdose of chloral. 'Another of us has gone', Hooker wrote to Huxley, 'what a tragedy it all is, it seems to take a bite out of one's life . . . He was quite the purest, brightest creature I ever knew to be a philosopher' (81).

In 1895, Huxley died, and by the time of his death, the X-Club had already become more a memory than an experience. 'The X-Club', Hooker wrote to Huxley's wife, 'died with him. I have never had the heart to ask for another meeting even to wind up' (82). Frankland died in 1899, and at the turn of the century only Hooker, Lubbock (now Lord Avebury) and Spencer remained. They rarely met or corresponded. Spencer reminded

Hooker in 1901 that 'It is a long time since any news passed between us—a year and a half, I think. Superfluous letter writing is, at your time of life, and even at mine, a thing to be avoided; but still, I should like to have a few lines telling me how you fare in your contest with the inevitable' (83). Hooker replied in kind and thanked Spencer for his evidence of abiding fellow feeling. '... the dear old Club is rapidly, with us, I fear, approaching the vanishing point. How curious it seems to me that we who were, I think, considered its oldest members, should be amongst the three survivors' (84).

The Club's continuous history falls clearly into three phases—the early heroic age between 1865–1880; the more mature counsels of the mid-1880s and early 1880s, and the disenchantments, disagreements and the elderly vagaries of the late 1880s and early 1890s. While the harmony of the first two decades welded the group together, it is not surprising that the passing years saw their share of dissent. Spencer remarked in 1904 that its ranks were 'never thinned by desertions or by differences' and that 'during these years nothing has occurred to disturb the harmony of our meetings' (85), but it is clear that this description was more nostalgic than accurate. No ordinary group could contain Tyndall's stubborn Liberalism, Lubbock's breezy self-assurance, Huxley's acid brilliance and Spencer's weighty dogmatism.

Altogether the Club met 240 times (86). Although an average of seven attended each dinner, all nine members appeared together only 27 times (87). Whatever effect such 'poor attendance' may have had on the group's effect as a lobby, it certainly did not diminish its public stature. For the historian, it is a tragedy that the practice of keeping formal records was abandoned (88). Though Hirst's Journals and the Club Notebook are highly suggestive, the absence of minutes has left obscure the Club's role at critical moments. Hints of its influence will certainly continue to grow as new MSS. come to light, and Frankland's private papers, if ever they become available to scholars, will undoubtedly help place the Club in perspective.

Given its background and assumptions, the X-Club could not outlive the deaths of its members, and was as unsuited as the Philosophical Club to the changed social circumstances of science after about 1900. The rise of specialization, and the development of science at the universities, signalled the end of the subtle monopoly of power held by the London scientific societies and the 'Young Guard'. While the Royal Society and the Athenaeum naturally continued to bring to focus the nation's scientific *élite*, influential scientific networks began to revolve more around university departments. Nonetheless, immortalized by the memory of its members, the legend of the X-Club has survived. Perhaps it has served as a model for

other informal groups of influential scientists in Britain and abroad. Certainly, its history has a continuing appeal for those who believe that informal *élites* still decide the most important questions of scientific policy. The concept of an 'open conspiracy' was of lasting importance. If the idea of the X-Club did not exist, others would soon have invented it.

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NOTES

- (1) Notable exceptions include Walter Cannon, 'The Role of the Cambridge Movement in Early Nineteenth Century Science', *Proceedings of the Xth International Congress of the History of Science*, 1962; and his 'Scientists and Broad Churchmen: an Early Victorian Network', *J. British Studies*, 4, 65-88 (1964). All work on the Victorian 'scientific aristocracy' must be indebted to Cannon, and to the pioneering accomplishment of Noel Annan's *Leslie Stephen* (London, 1951).
- (2) Letter of Fiske to wife, 8 December 1873, quoted in H. H. Harper, *The Personal Letters of John Fiske* (Cedar Rapids, 1939), p. 144, and with modifications in E. F. Fiske, *The Letters of John Fiske* (New York, 1940), p. 283. See 'The Human Side of Great Scientists', *Scientific American*, 15 June 1912, p. 530.
- (3) See Sir A. Geikie, *Annals of the Royal Society Club* (London, 1917), p. 1; T. G. Bonney, *Annals of the Philosophical Club of the Royal Society* (London, 1919).
- (4) Joseph F. Payne, *History of the College Club of the Royal College of Physicians in London* (London, 1909); T. E. Allibone, 'The Club of the Royal College of Physicians, the Smeatonian Society of Civil Engineers and their Relation to the Royal Society Club', *Notes & Records Roy. Soc. Lond.* 22, 186-192 (1962).
- (5) [W. H. Smyth], *Sketch of the Rise and Progress of the Royal Society Club* (London, 1860), p. 60.
- (6) O. J. R. Howarth, *The British Association for the Advancement of Science: A Retrospect: 1831-1931* (London, 1931), p. 91. See also John Timbs, *Clubs and Club Life in London* (London, 1872), p. 258.
- (7) Quoted in H. G. Hutchinson, *Life of Sir John Lubbock, Lord Avebury* (London, 1914), p. 63. The quotation derives from Huxley's obituary of Tyndall in the *Nineteenth Century*, 35 (January, 1894), p. 6.
- (8) Alexander Scott, Presidential Address to the Chemical Society, *J. Chem. Soc.* 109, 342-351 (1916). Around the turn of the century the 'B Club' was succeeded by the Chemical Club.

- (9) *Huxley Papers* (Imperial College), vol. 3, f. 23. Hooker to Huxley, Summer 1856.
- (10) *Ibid.*
- (11) *Ibid.*
- (12) Leonard Huxley, *The Life and Letters of T. H. Huxley* (London, 1900) (hereafter *L. L. Huxley*), vol. 1, p. 256.
- (13) *Ibid.*
- (14) H. Spencer, *An Autobiography* (London, 1904), vol. 2, p. 115.
- (15) *Hirst Journals*, vol. 4, p. 1702. Entry of 6 November 1864.
- (16) W.N.W. and S.J.C., *Sketches from the Life of Edward Frankland* (hereafter Frankland) (London, 1902), p. 138.
- (17) *Proc. Roy. Soc.* 52, xii-xviii (1893).
- (18) *Lubbock Papers* (British Museum), Add. MSS. 49,638, f. 28. Huxley to Lubbock, 10 December 1856.
- (19) *Lubbock Papers*, Add. MSS. 49,670, f. 76. Hooker to Lubbock, 2 July 1907.
- (20) Frankland, *op. cit.* p. 51.
- (21) Spottiswoode was elected on 8 December. *Hirst Journals*, vol. 4, p. 1709. Entry of 14 December 1864.
- (22) Spencer, *op. cit.* vol. 2, p. 115. From Hirst's early minutes it appears that Busk was asked to invite William (later Sir William) Fergusson (1808-1877) to join. Fergusson was then Professor of Surgery at King's College, London, and was afterwards serjeant-surgeon to Queen Victoria and President of the Royal College of Surgeons. His election would have increased the number of medical men in the Club. Apparently, he declined to be elected. Frankland, *op. cit.* pp. 151-152.
- (23) *L. L. Huxley*, vol. 1, p. 256.
- (24) Naturally the 'X' was not the only club where men of science could meet. But there was no other single venue where these nine could all assemble. Spottiswoode, for instance, did not belong to the Athenaeum, and Spencer did not belong to the Royal Society. (This was, of course, a very sensitive point with Spencer, whose candidacy for the Royal Society in 1874 aroused a small storm in the scientific community. See David Duncan, *The Life & Letters of Herbert Spencer* (London, 1908), p. 169.) Three of the nine, Tyndall, Hooker, and after 1884, Huxley, belonged to 'The Club', the exclusive dining society founded by Sir Joshua Reynolds in 1764, whose members included Kelvin, Rosebery, Salisbury, Gladstone, Grant Duff and William Flower. (See C. J. Cornish, *Sir William Flower* (London, 1904), p. 218.) In May 1890, Hooker had Gladstone to dinner at the Club and in 1892 invited Lubbock to join. See Leonard Huxley, *Life and Letters of Sir Joseph Dalton Hooker* (London, 1918) (hereafter *L. L. Hooker*), vol. 2, p. 343, and *Lubbock Papers*, Add. MSS. 49,653, f. 39. Hooker to Lubbock, 17 February 1892.
- (25) Frankland, *op. cit.* p. 150.
- (26) Frankland, *op. cit.* pp. 148-162.
- (27) Hirst's *Journals* and Tyndall's diaries, both deposited in the Library of the Royal Institution also contain many passing references to the X Club, but no detailed minutes of Club proceedings.
- (28) Spencer, *op. cit.* p. 16.
- (29) C. Bibby, *T. H. Huxley: Scientist, Humanist and Educator* (London, 1959), p. 249.
- (30) *L. L. Huxley*, *op. cit.* vol. 1, p. 258; Frankland, *op. cit.* p. 51.
- (31) Hooker (1868), Huxley (1870), Tyndall (1874), Spottiswoode (1878) and Lubbock

- (1881). Under the circumstances, it is curious that of the remaining four, Frankland, was *not* made President of the B.A. Sir Henry Armstrong attributes his 'jilting' [*sic*] to the nation's consistent disregard of chemistry and its applications. See H. E. Armstrong, First Frankland Memorial Oration of the Lancastrian Frankland Society, *J. Soc. Chem. Ind.* **53**, 464 (1934).
- (32) Spencer, *op. cit.* vol. 2, p. 116.
- (33) *Hirst Journals*, vol. 4, p. 1786, entry 10 May 1866.
- (34) *Hirst Journals*, vol. 4, p. 1702, entry 6 November 1864.
- (35) *L. L. Hooker*, vol. 2, p. 359. Tyndall held that he saw atoms visually in his mind's eye, but was unable to describe to Huxley what he saw; Huxley quickly replied: 'Ah, now I see myself, in the beginning was the Atom, and the Atom is without form and structure and darkness sits on the face of the Atom.'
- (36) Spencer, *op. cit.* vol. 2, p. 136.
- (37) *L. L. Hooker*, vol. 2, p. 349.
- (38) Spencer, *op. cit.* vol. 2, p. 120. References which follow are cited in the small *X Club Notebook* kept with the Hirst and Tyndall papers at the Royal Institution.
- (39) Frankland, *op. cit.* p. 160. In February 1869, Hirst wrote: 'We were more than once called to order by Spencer, for allowing the conversation to become broken up, instead of remaining general.' *X Club Notebook* (R.I.), p. 40.
- (40) Spencer, *op. cit.* vol. 2, p. 116.
- (41) See Huxley, *Nineteenth Century*, **35**, 11 (1894), cf. Bibby, *op. cit.* p. 249.
- (42) *Tyndall Papers* (Royal Institution), vol. 2, f. 644, Tyndall to Hirst, 17 December 1876.
- (43) Frankland, *op. cit.* p. 162.
- (44) *Huxley Papers*, vol. 18, f. 174, Huxley to Hirst, 9 December 1872.
- (45) There are contradictory impressions about the date and number of these Saturday meetings. Frankland says (*op. cit.* p. 48) that there were the usual monthly meetings for June; Spencer (*op. cit.* p. 117) insists that they were supplementary.
- (46) *L. L. Huxley*, vol. 1, p. 258.
- (47) *Ibid.* p. 261.
- (48) Neither Frankland nor Spencer, however, directly attributed the Club's change in practice to these events.
- (49) Spencer, *op. cit.* vol. 2, p. 219.
- (50) *Ibid.* p. 282.
- (51) David Duncan, *The Life and Letters of Herbert Spencer* (London, 1908), p. 248.
- (52) *Huxley Papers*, vol. 2, f. 276, Huxley to Hooker, 24 October 1895.
- (53) *Huxley Papers*, vol. 3, f. 321, Hooker to Huxley, 25 March 1888.
- (54) Francis Galton, *Memories of My Life* (London, 1908), p. 191.
- (55) Frankland, *op. cit.* p. 161; *Huxley Papers*, vol. 16, f. 268. Frankland to Huxley, 5 December 1886.
- (56) *L. L. Huxley*, vol. 1, p. 259.
- (57) *Ibid.* vol. 2, p. 119.
- (58) *Tyndall Papers*, vol. 16, f. 672.
- (59) *L. L. Huxley*, vol. 1, p. 258.
- (60) *Huxley Papers*, vol. 16, f. 272, Frankland to Huxley, 15 March 1872.
- (61) Duncan, *op. cit.* p. 249, Spencer to Huxley, 7 December 1885.
- (62) *Ibid.* p. 332, Tyndall to Spencer, 25 November 1889. For the controversy see Duncan, *op. cit.* pp. 331-335.

- (63) *Ibid.* p. 333, Spencer to Tyndall, 9 December 1889.
- (64) *Ibid.* p. 327, Spencer to Huxley, 10 March 1886.
- (65) *Huxley Papers*, vol. 8, f. 246, Huxley to Tyndall, 7 May 1886.
- (66) *Lubbock Papers*, Add. MSS. 49,646, f. 52, Huxley to Lubbock, 2 June 1886.
- (67) *Lubbock Papers*, Add. MSS. 49,648, f. 28, Tyndall to Lubbock, 25 October 1888.
- (68) *Tyndall Papers*, vol. 3, f. 2767, Hooker to Tyndall, 3 May 1889.
- (69) Frankland, *op. cit.* p. 162.
- (70) On 15 October, Tyndall wrote to Busk's sister: 'I never knew a man possessed of a more genuine love for science in its best and broadest sense . . . Had he been less noble than he was he might have been more talked about by the public.' *Tyndall Papers*, vol. 1, f. 187.
- (71) *Tyndall Papers*, vol. 8, f. 2790, Hooker to Tyndall, 6 March 1892.
- (72) *Tyndall Papers*, vol. 9, f. 3153, Tyndall to Huxley, 18 February 1892.
- (73) *Tyndall Papers*, vol. 8, f. 2791, Hooker to Tyndall, 30 April 1892.
- (74) *Huxley Papers*, vol. 3, f. 389, Hooker to Huxley, 24 April 1892.
- (75) *Huxley Papers*, vol. 3, f. 391, Hooker to Huxley, 30 May 1892.
- (76) *Tyndall Papers*, vol. 8, f. 2792, Hooker to Tyndall, 20 June 1892.
- (77) *Huxley Papers*, vol. 8, f. 442, Tyndall to Huxley, 27 December 1892.
- (78) *Tyndall Papers*, vol. 3, f. 1165, Spencer to Tyndall, 30 January 1893.
- (79) *Huxley Papers*, vol. 3, f. 400, Hooker to Huxley, 23 March 1893.
- (80) Duncan, *op. cit.* p. 327, Spencer to Lubbock, 18 May 1893.
- (81) *L. L. Hooker*, vol. 2, p. 349.
- (82) *Huxley Papers*, vol. 3, f. 341, Hooker to Mrs. Huxley, 24 October 1897.
- (83) Duncan, *op. cit.* p. 456, Spencer to Hooker, 16 March 1901.
- (84) *Ibid.* p. 470, Hooker to Spencer, *ca.* June 1903. Spencer died in 1903, Hooker in 1911, and Avebury in 1913.
- (85) Spencer, *op. cit.* p. 118.
- (86) Frankland, *op. cit.* p. 162. Frankland says he himself attended 186 times; Spencer attended 173 times; Huxley, 171; Hirst, 170; Hooker, 169; Spottiswoode, 160; Tyndall, 147; Busk, 143; and Lubbock, 131.
- (87) Spencer, *op. cit.* p. 118.
- (88) Frankland, *op. cit.* p. 160.