AMERICANS AND THE ROYAL SOCIETY 1783-1937

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As one approach to the study of the scientific relations between Great Britain and the United States, even for those who would affirm that all science is international, the proposals or the elections of American scientists as foreign members or as medalists of the Royal Society contain much of interest.[1] Not until similar lists are drawn up of American membership in other foreign learned societies, keeping in mind the changing value of such membership because of the varied careers of various societies, can historical reflection be freely indulged; but so important has been any recognition by the Royal Society that we may be content for the moment to confine attention to it.

After the American Revolution, James Bowdoin in 1788 was the first "foreign" American member. The long period of non-recognition lies between the years 1818 and 1852, the date of Nathaniel Bowditch's election and the selection of Benjamin Peirce. Louis Agassiz, elected in 1838, could scarcely have been considered to draw attention to America until some years after his emigration to that country in 1845. And by a chance, Audubon was elected as a home member in 1830, although it is more true to say that it was because of the work he was carrying on in the States.

The progressive increase of American membership (see Table I) is obvious after 1918. Further than that, speculation over the dates may be left to the reader. But it is undoubtedly true that such events as the meeting of the British Association in Canada in 1884 brought the British into personal touch with activities below the border, and personal visits of men like Sir Joseph Hooker and Huxley at other times served to facilitate the recognition of American science. It will be noted that members of the British Empire, particularly Canadians, frequently acted as conductors. I hazard one query: did France follow more closely American developments in science?

The learned societies of the two countries were especially interested in uniting efforts for a systematic meteorological inquiry in North America, and American resolutions were forthcoming urging the continuance of the Toronto observatory.[2] Part of the penetration by America depended upon the interchange of her scientific literature with Great Britain. Considerable correspondence, especially with the Smithsonian Institution, was concerned in maintaining and extending the duty-free list.[3] In an office letter, W. White wrote to General Sabine on December 28, 1860:[4]

> With respect to the difficulties which have hitherto prevailed in the distribution of the consignments of books to this country, they are owing to no fault on this side of the water.

The Smithsonian had begun to send books to individuals and organizations not on the list drawn up by the Royal Society as receiving duty-free books from abroad. Mr. White continues:

> Among the places and establishments embraced in this enlarged scheme of distribution, are Lunatic Asylums, Provincial Libraries, Mechanic's Institutes, Consular Offices, various Clubs, Lloyds, the Custom House, the Foreign Office, Military Academy, Harbour Offices, Town Clerks' Offices, Boards of Health, Schools of Arts, Railway Stations, Blind Schools, and sundry bookselling firms, and among Individuals are, the Editor of the *Times*, Editors of various Periodicals and Reviews, and many persons unknown to the R.S. In one consignment there was sent a bundle of a religious pamphlet for distribution which could hardly come within the definition of scientific books.

This democratic extension delayed those consignments which could go legitimately upon the free list.

Naturally the Smithsonian had attracted attention. Edward Sabine, then foreign secretary of the Royal Society, wrote from Woolwich, October 19, 1849,[5]

> that an official letter will follow, But I take, in the mean time, the earliest opportunity of informing you that the Council of the Royal Society have had great pleasure in complying with the request made to them to place the

[1] The material for this article has been drawn mostly from the Royal Society Library, Burlington House, London. The society's official correspondence for the nineteenth century does not have much relevance, although a survey of it shows that a few contacts were maintained. Cataloguing of the mss. continues by the staff, hence, exact references are not made. The Bache and Henry letters are to be found in the Edward Sabine collection, as yet, uncatalogued. Proceedings of the Royal Society, Vol. xi, Lond. 1862; vol. xxvi, Lond. 1878. Minutes of Council, Royal Society, 4 vols., 1833–1877; Index of Council Books (mss.) vols. 1–4. Certificates of Royal Society, 1784–1936. Mss. The Year-Book of the Royal Society, 1896–1936. See especially the volume for 1912. Royal Society Medal Claims, 1873–1936. Privately printed. Vol. 1, 1873–1909; Vol. 2, 1910–. Royal Society List of Fellows, 5 vols., 1775–1900.

[2] Royal Society Min. of Council, Vol. II, pp. 176–179, 1850. See resolution, Amer. Acad. of Arts and Science, Cambridge, 25 Nov., 1850, in official correspondence.

[3] Royal Society Min. of Council, Vol. II, pp. 196–198, 1851.

[4] Letter Book, p. 162. See also pp. 168–169.

[5] Letter Book, copy, p. 106. See also p. 107.

TABLE I

AMERICAN FELLOWS OF THE ROYAL SOCIETY, 1783–1937

Explanation:

The number of foreign members is limited to 50. Certain fellows elected as home members are marked (*). Fellows elected as home members or as foreign fellows of another country, but now in the U. S., are not included. Addresses are given at the time of election. The proposers are included in brackets. It is interesting to note that the Royal Society of Edinburgh, with its honorary foreign membership restricted to 44, has had 28 Americans on its list, counting from the year 1895.

Fellows	Date of election
Bowdoin, James, President of the American Academy (see text)	1788
Rittenhouse, David, President of the Amer. Phil. Society (see text)	1795
*Hosack, David, New York (proposed by: James Edward Smith, John Abernethy, Abraham Rees, George Parson, Gilbert Blane)	1816
Bowditch, Nathaniel, Boston (see text)	1818
*Audubon, J. J. (see text)	1830
Agassiz, Louis, Neufchatel, Copley Medal, 1861	1838
Peirce, Benjamin, Cambridge, Mass. (Edward Sabine, J. Hunter Christie, William Henry Smyth, *et al.*)	1852
Bache, Alexander Douglas, Washington (William Farr, Edward Sabine, W. A. Miller, B. C. Brodie, *et al.*)	1860
Gray, Asa, Cambridge (G. B. Airy, W. Spottiswoode, G. G. Stokes, T. H. Huxley, W. H. Miller, and J. Todhunter)	1873
Newcomb, Simon, Washington, Copley Medal, 1890	1877
*Hughes, David Edward, London	1880
Dana, James Dwight, New Haven (Joseph Prestwick and Hugo Müller). Copley Medal, 1877	1884
Rowland, Henry A., Baltimore (G. Carey Foster and W. H. Preece)	1889
Agassiz, Alexander, Cambridge, Mass. (Alfred Newton)	1891
Gould, Benjamin Apthorp, Cambridge, Mass. W. H. Christie)	1891
Newton, Hubert Anson, New Haven (Kelvin)	1892
Langley, Samuel P., Washington, Rumford Medal 1886 (1884—W. Abney; 1888—G. G. Stokes; 1895—Kelvin)	1895
Gibbs, J. Willard, New Haven, Copley Medal, 1901 (1891—Rayleigh; 1895—A. W. Rucker)	1897
Hill, George William, New York, Copley Medal, 1909 (1896—Horace Lamb and P. A. MacMahon; 1902—H. H. Turner)	1902
Michelson, Albert Abraham, Chicago, Copley Medal, 1909 (1894—Rayleigh; 1897—R. B. Clifton; 1902—W. Hicks)	1902
Pickering, Edward Charles, Cambridge (H. F. Newall)	1907
Mitchell, Silas Weir, Philadelphia (David Ferrier)	1908
Hale, George Ellery, Mount Wilson, Calif., Copley Medal, 1932 (1899—G. Johnstone Stoney; 1907—Joseph Larmor)	1909
Gilbert, Grove Karl, Washington (1915—A. Strahan)	1918
Campbell, William Wallace, Mt. Hamilton (1916—Joseph Larmor)	1918
*Matthew, William Diller, New York	1919
Flexner, Simon, New York	1919
Morgan, Thomas Hunt, New York, Darwin Medal, 1924 (1916—W. Bateson)	1919
Richards, Theodore William, Cambridge, Davy Medal, 1910 (F. G. Donnan)	1919
Wood, Robert Williams, Baltimore	1919
Wilson, Edmund Beecher, New York (1916—E. B. Wilson and W. Bateson; 1921—W. Bateson)	1921
Osborn, Henry Fairfield, New York, Darwin Medal, 1918 (1915—A. Smith Woodward; 1920—E. Ray Lankester; 1925—E. Goodrich)	1926
Lusk, Graham, New York (1930—A. B. Macallum)	1932
Smith, Theobald, Princeton, Copley Medal, 1933 (1932—J. A. Arkwright)	1932
*Taylor, Hugh Stott, Princeton	1932
Cushing, Harvey, New Haven (1933—Wilfred Trotter and H. H. Dale)	1933
Langmuir, Irving, Schenectady, Hughes Medal, 1918	1935
Russell, H. N., Princeton	1937
American Medalists, not fellows of the Royal Society	
Buchanan Medal: William C. Gorgas	1912
Hughes Medal: Alexander Graham Bell	1913
Robert Andrews Millikan	1923
William David Coolidge	1927
Davy Medal: Edward W. Morley	1907
Arthur Amos Noyes	1927
Gilbert Newton Lewis	1929

Smithsonian on the list of Institutions to which the Phil. Trans. are prescribed; for confident anticipations are felt, and were expressed by several members of the Council who were present, that an Institution, which has commenced its public offices so worthily, will not fail to raise itself to a high and important station among those National Establishments, and Associations of Scientific and Literary men, whose express object it is to advance or to diffuse intellectual knowledge.

The Officers, Regents, and Members of the Smithsonian Institution may be assured that their progress in the honourable career which they have marked out for themselves will be regarded by the Royal Society with the liveliest interest, and the most hopeful expectations.

In writing to Sabine, Joseph Henry frequently talked about the Smithsonian. In November 7, 1849, he wrote:

I sent you a copy of our programme some time since with the request that you would favor me with any criticism with reference to it which might occur to you. To this I have not received an answer but I shall consider the remarks in your letter as an approval of the general plan. The programme is not in every respect what I could wish.

There were many persons to be consulted and we were consequently obliged to make some compromises to satisfy all parties. Mr. Bache and myself wished to establish the institution on the most liberal plan; namely that of doing the greatest good to the greatest number and to diffuse the benefits of the benevolent bequest of Smithson among men of every clime. We were however obliged to give way in part to local influence and to acquiesce in the expenditure of more money (from the income, not the principal), for the erection of a building than was necessary.

He was hopeful that the plan would be satisfactory. On November 10, 1860, he wrote:

For the last six or seven years we have gone on smoothly and harmoniously, previously to that time my position was a very disagreeable one. . . . I regret that in carrying out the plans for which I was induced to accept the charge [?] of the Institution I have been obliged to come in collision with the views and the interests of many individuals and consequently to call forth their opposition; but I have constantly leaned upon the support and approbation of those who are best qualified to judge of the worth of my labours. . . .

II

In the following account and in the Table, the proposers are cited because of the bearing their names have in the study of scientific relations and ideas.

A certificate first read on June 7, 1787, and accepted on April 3, 1788, follows:

James Bowdoin, Esquire, governour of the State of Massachusetts-Bay, president of the American Academy of Arts and Science in Boston, and author of several essays and letters on philosophical subjects, being desirous of becoming a fellow of the Royal Society on the foreign list, we, whose names are hereunto subscribed, do, from our knowledge of his merit, strongly recommend him as highly deserving of the honour he requests, and likely to prove a very useful and valuable member.

Richard Price, R. Kirwan, Edward Bancroft, Richard Paul Jodrell, P. Jodrell, John Paradise, William Bentinck and Caleb Whitefoord signed the certificate. David Rittenhouse's certificate, first read on November 6, 1794, was signed by H. Cavendish, Jesse Ramsden, A. Shepherd, Alexander Aubert, Nevil Maskelyne and Caleb Whitefoord.

The proposal for Nathaniel Bowditch was presented eighteen times between the first reading of May 15, 1817, and the election, March 12, 1818. Ten readings was the usual course. Joseph Banks, Charles Babbage, John Pond, C. Blagden, J. F. W. Herschel, Thomas Young, Edward F. Bromhead, Alexander McLeay and William Vaughan signed it. Audubon's certificate, read on December 10, 1829, balloted on March 18, 1830, is more interesting:

John J. Audubon, Esqre, of No. 79, Newman Street, Oxford Street (but at present in the United States of North America) a Gentleman eminently distinguished for his knowledge in Natural History, and especially Ornithology,—and Author of the splendid work on the Birds of America now in course of publication; being desirous of becoming a Fellow of the Royal Society . . . etc.

It was signed by Aylmer Bourke Lambert, John George Children, N. A. Vigors, Edward Hawkins, A. Sedgwick and H. Coddington.[6]

In connection with Bache's membership, his correspondence with Sabine is worth two quotations. He frequently talked about the Coastal Survey. On March 31, 1859, he had written,

The bestowal of the Victoria Medal by the Geographical Society was a most agreeable memento, and the notices of the Coast Survey from your side have been of the greatest use in defence against the attacks to which we are now and then subjected. . . .

In June of the same year, he added:

The "panic" and exhausted Treasury of the U. S. have made against our progress, but the popularity of the work has kept up the appropriations during the time of trouble.

After promising to cooperate with Sabine, he concludes:

I feel much pleasure by the interest which you inform me the Prince Consort takes in our observatory.

In discussing the medal claims, and in giving the list of membership proposals never made effective, it is just as well to note here that it is quite as significant for the more detailed study of scientific relations as the successful list, and implies no derogation of the proposed or the proposer. Few awards or few places among the fifty foreign fellows, or untimely death, or the vagaries of balloting would be some of the reasons for not entering the fold. Obviously, since *recommendations* are involved the language is most positive and gratifying.

Upon proposing A. A. Michelson for membership, W. Hicks wrote in 1902 that Michelson "is perhaps the foremost experimentalist in the domain of physical optics and is distinguished for the accuracy of his results as well as for his ingenuity in design." H. H. Turner said of G. W. Hill in 1902: "His work on the Lunar Theory has made a new epoch in the subject; and has had great influence in Planetary Theory also." In recommending G. K. Gilbert, A. Strahan said in 1915 that he is "distinguished for his work in all branches of geology in the United States, much of which has proved to be of world-wide significance."

[6] The certificate of the Englishman, G. W. Featherstonhaugh, elected 1835, is of interest. He is described as "a gentleman who has zealously promoted the cultivation of geology in the United States," and who is now to conduct an extensive geological and mineral survey of the U. S. The certificates of Phineas Bond, 1815, and of Thomas Cooper, 1791, should be noted.

Joseph Larmor said of W. W. Campbell, 1916, that he has "contributed very substantially by his observations to the foundations of stellar and solar astronomy." In the proposal of 1920, E. Ray Lankester characterized H. F. Osborn as "the most distinguished living paleontologist." A. B. Rendle writes in 1925 that Sargent "has made the Arnold Arboretum one of the foremost botanical gardens of the world and whose active encouragement of horticultural exploration has added a great number of valuable economic and ornamental trees and shrubs to the collection of both Old and New Worlds."

A. B. Macallum in 1930 described Graham Lusk as "the outstanding physiologist in the United States." Wilfred Trotter spoke of Cushing's work in these terms: "Our present knowledge of pituitary fracture and disease and such control of them as we possess are largely due to work he has done or inspired." In proposing William Henry Welch, John G. Adami said in 1917: "to whose influence, more than to that of any other man is due the outburst of medical research in the United States which has characterized this generation."

We can not discuss the proposals which may still be valid for membership. It is sufficient to note that they bear out the observation of the accelerating progress of science in America since the war. The following were at one time placed before the society:

Edward Cope, (proposed 1896, by E. Ray Lankester).
Charles A. Schott, (proposed 1899, by Ettrick W. Creak).
C. Hart Merriam, (proposed 1911, by M. R. O. Thomas).
Henry Howe, (proposed 1921, by R. A. Hadfield).
Charles S. Sargent, (proposed 1925, by A. W. Hill, A. B. Rendle and Frederick Keeble).

Before recounting further some of the expressions of opinions involved in presenting the American scientist to the British mind, it is necessary to explain briefly that the Copley Medal is awarded to the living author of such philosophical research, either published or communicated to the society, as may appear to the council to be deserving of that honor. The subject or subjects of research must be specified in making the award; there is no limitation as to nationality. The Davy Medal is awarded annually for the most important discovery in chemistry made in Europe or "Anglo-America"; the Darwin Medal, biennially, in reward of work, especially in biology, in any country; the Buchanan Medal every five years for distinguished service in hygienic science or practice in any country; the Sylvester Medal, triennially, for encouragement of mathematical research in any country; the Hughes Medal, annually, in any country for original discovery in the physical sciences, particularly electricity and magnetism or their application. The Rumford Medal is awarded once every second year for discovery or useful improvement on heat or on light.

In announcing the award of the Copley Medal to Louis Agassiz in his presidential address, November 30, 1861, Sir Benjamin Collins Brodie said:[7]

> The results of these inquiries, and those of his fellow-labourers, Clark and Weinland, are embodied in the magnificently illustrated monograph entitled "Contributions to the Natural History of the United States," works which do equal credit to the naturalists who planned them, and to the State and people whose intelligent munificence renders their publication possible.

It is significant that the first award since we had become a nation went to a famous emigrant!

Upon the occasion of awarding the Copley Medal to the first indigenous product, Dana, Sir Joseph Hooker in his presidential address, November 30, 1877, spoke of his recent visit to the States.[8] He detailed the work being done at the Harvard College Observatory, the survey conducted by Dr. Hayden and his own interest in American flora.

> I must not end my notices of some of the labours of our scientific breathern in the United States without expressing my admiration of the spirit and the manner in which the Government and people have cooperated in making known the physical and biological features of their country, and my conviction that the results they have given to the world are, whether for magnitude or importance, greater of their kind than have been accomplished within the same time by any people or government in the older continent.

However, in 1875, Professor Leidy had been proposed for the Copley Medal, especially for his researches "On the Extinct Mammalian Fauna of Dakota and Nebraska." Dana's claims were put forward by P. M. Duncan, 1877, for work done in mineralogy and geology, and for his books on those subjects well known to the general reader.

> Dana may be considered as the Lyell and Miller of the United States; but he is in advance of any European philosopher in his personal knowledge of the grand and minute phenomena which refer to physical geography in its relation to physical geology.

Simon Newcomb was first proposed for the Copley Medal in 1880 by E(dwin) D(unkin); not since 1850 had the medal been given to an astronomer. In 1889 he was proposed by W. Huggins, in particular for his investigation of the moon's secular acceleration, the discussion of solar parallax and the determination of the velocity of light, and again in 1890 by W. H. M. Christie.

In 1884 there were two Americans considered for the Rumford Medal, Samuel P. Langley and Henry

[7] Proceedings, Vol. XI, pp. 461–462.
[8] *Ibid.*, Vol. XXVI, pp. 438–446.

Rowland. William Abney urged it for Langley because of his searches in solar physics, but especially for his investigations on the radiant energy of the sun, and his determination of the wave-lengths of the dark rays of low refrangibility from λ 12,000 to λ 28,000. G. Carey Foster had proposed Rowland for his spectroscopic study of radiant heat and light, and the determination of the value of the mechanical equivalent of heat, and generally as one of the founders of the *American Journal of Mathematics*. As professor of physics in the Johns Hopkins University, "he is at the head of the most important school of physical research in America." Langley was again proposed in 1886 by Rayleigh; and so was Rowland in 1888 by W. H. Preece, who added that before the British Association he had exhibited a map of the solar spectrum which in clearness of definition and for magnitude exceeded anything seen before, and again in 1890 by J. J. Thomson.

J. J. Thomson put forward Willard Gibbs's name in 1890 and 1891 for the Davy Medal because of his paper on the "Equilibrium of Heterogeneous Substances" which will have a great influence on chemistry. Oliver Lodge proposed Gibbs again in 1894. In 1901, H. E. Armstrong proposed him for the Copley Medal because of his contribution to the "phase rule."

R. T. Glazebrook put forward A. A. Michelson's name in 1894 for the Rumford Medal, mentioning the paper read before the British Association at Edinburgh in 1892, for his work in experimental optics and the use of the interference refractometer for the study of the distribution of light in a spectral line. H. F. Newall proposed him for the Copley Medal in 1906 in the same terms "and for having introduced a new order of refined precision into an already precise subject." William Huggins reproposed him in 1907, saying, "Michelson's genius has opened up new ground in experimental optics."

H. B. Dixon in 1903 suggested E. W. Morley for the Davy Medal because of his work on the atomic weight of oxygen by determining the proportion, both by weight and volume, in which oxygen and hydrogen combine. "No startling discoveries can be expected to reward such labours, but every chemist is indebted to him for the establishment of a constant of the first importance." He was reproposed in 1907 by A. Scott. For the industrial development of the electrical industry, Elihu Thomson was named for the Hughes Medal in 1906, and in 1907 by S. P. Thompson, who wrote, "He has been conspicuous in maintaining a high scientific level in his work as an electrical engineer."

In proposing G. W. Hill in 1907 for the Copley Medal, H. F. Newall quotes Sir George Darwin's tribute to him in an address to the British Association in South Africa for his work in the determination of perpetual orbits and their stability. It is suggested that he lay the point of departure for Poincaré, Darwin, E. W. Brown, Hough and others. David Gill, repeating the proposal in 1909, praised his work on the moon's motion, and herein his "introduction and development of the principle of disturbed periodic orbits has given an entirely new direction to the science. . . ." "All his work is characterized by its original points of view combined with practical aims, by maturity of thought and high suggestiveness. It forms an index of the simplicity and aloofness of its author who has been one of the main ornaments of Astronomical Science for more than a generation."

Herbert B. Baker, suggesting T. W. Richards for the Davy Medal in 1910, writes, "it is probably no exaggeration to say that he has done more to raise the standard of accuracy in physico-chemical work than any other living chemist. He has supplied some of the most rigorous proofs of the universality of Faraday's Law."

Much historical interest attaches to Ronald Ross's nomination of William Crawford Gorgas in 1912 for the Buchanan Medal. Gorgas possessed complete knowledge of all sanitary organization in the tropics and the qualities necessary to insure its success.

> But in addition to these qualifications, which are possessed by many good sanitary officials, Colonel Gorgas has been called upon to lead the way for the first time in the prevention of a new class of diseases, namely, those that are carried by insects. His first work in this direction in 1901 coincides with my first recommendations on the subject, but was, I believe, largely independent of them. . . . If the Buchanan Medal is to be given principally for sanitary practice, I cannot conceive a more worthy candidate for it than Colonel Gorgas.

For his work in applied sciences, Alexander Graham Bell was suggested by E. W. McBride in 1913 for the Hughes Medal. Joseph Larmor in 1914 put forward the name of R. W. Wood for the Rumford Medal in these terms: "His treatise on Physical Optics bears the individual impress of his own work, and is remarkable for the wealth of ingenious and striking experiments of which it contains a record." His work on the subject of optical radiations was also noted. A second proposal in 1924 by T. R. Merton says, "His investigations of the time interval between the absorption and emission of light in fluorescence are an example of the great ingenuity and experimental skill which is characteristic of his work."

As early as 1918, G. C. Bourne was suggesting Thomas Hunt Morgan for the Darwin Medal.

> Prof. Morgan's works have been noteworthy for their grasp of fundamental principles, and for the critical faculty which has enabled him to distinguish the weak points

in current evolutionary doctrines, and to undertake researches directed to the elucidation of obscure and doubtful principles.

He has largely advanced the knowledge of the "phenomena of coupling and repulsion," and has added to the knowledge of sex-linked inheritance, and has contributed to an explanation "of the part played by the chromosomes in inheritance. . . ." With a tribute to Morgan's disciples, J. T. Wilson in 1922 reaffirmed that Morgan's "Monograph on the Development of the Frog's Egg" is still a classic, and that the treatise on "Regeneration" at once became, "and still is, the leading authority on the subject in our language." His work has been in favor of "the complete and accurate correlation of the two sets of facts, cytological and 'Mendelian.'" E. S. Goodrich recommended Morgan in 1924.

Also in 1918, W. A. Herdman suggested Henry Fairfield Osborn for the same medal. One of the results of his work is

> the more precise determination of the relative ages of the extinct mammals in North America, and that has led to the correlation between the order of succession of the mammalia in Europe and America. . . . All his work has been of an evolutionary character. He has written on the bearing of palaeontology upon Darwinism, and it seems most appropriate that he should be the recipient of the Darwin medal.

In putting forth the name of R. A. Millikan, 1923, James Jeans wrote, "He is proposed for the Hughes Medal especially for his determination of the electronic charge e and of Planck's constant h. . . . His determination of h was not only remarkable in itself, but was of still greater value as finally vindicating the Einstein-Bohr view of the nature of the photo-electric phenomenon." Jeans also wrote of George Ellery Hale for the Copley Medal in 1924. He enumerated Hale's spectroheliograph and the discovery of the Zeeman effect in the faint light emitted by the umbrae of sunspots.

> Prof. Hale's outstanding eminence rests on a combination of three qualities each of which he possesses in extraordinary degree: first, a remarkable ingenuity in the design of astronomical instruments; second, skill and enthusiasm which enable him to get the utmost out of the instruments he has designed and third, a power of multiplying many-fold the productivity of his ideas by inspiring his co-workers with his own enthusiasm.

Rayleigh wrote in 1932 of Hale's spectrohelioscope,

> We may confidently expect that it will contribute to clearing up the mysterious relations between terrestrial magnetism and solar phenomena.

James Walker wrote in his suggestion for the Davy Medal in 1927:

> Prof. Arthur Amos Noyes was the torch-bearer of the modern theories of solution to the West . . . Noyes has exercised a great influence on physical chemistry, not only by the value of his experimental work, but by his careful analysis of the fundamental concepts of the science, and by his clear and logical presentations of their nature and their interrelations.

His work on electrolytic solutions, the velocities of reactions of different orders and reaction-velocity in heterogeneous systems was specified.

It was said of Edmund Beecher Wilson in a proposal for the Copley Medal in 1926 by J. H. Ashworth that "his papers on the development of the earthworm (1887, 1889) and on the cell-lineage of Nereis (1892) are classics, and were the models for numerous subsequent studies on the embryology of invertebrates." Further, "By his own investigations and by those of his pupils, Professor Wilson has exerted a far-reaching influence on the progress of cytological knowledge during the past thirty years." Similar proposals were made by E. S. Goodrich in 1931 and 1932.

Arthur Lapworth considered Gilbert Newton Lewis one of the leaders of modern physical chemistry, especially in chemical thermodynamics, and in proposing him for the Davy Medal he spoke of his valuable work in the field of electrode potentials; "his recognition of the fundamental importance of the electron duplet have greatly influenced the development of modern chemical theory." W. D. Coolidge was recommended for the Hughes Medal by R. T. Glazebrook in 1927. Joseph A. Arkwright in 1932 and 1933 suggested Theobald Smith for the Copley Medal, saying that in 1896–98 he first clearly distinguished between the human and bovine types of *Bacillus tuberculosis* and the forms of disease which they produce, "preceding Koch's pronouncement in 1901." Later work was adumbrated.

Thus, in one small part of the chronicles of British science has the course of American science been traced. It is pleasant narration because of the material used; a fuller picture might well have more shadows.

SCIENTIFIC EVENTS

LIVERPOOL CANCER COMMISSION OF INQUIRY

THE London *Times* reports that on the initiative of Lord Derby, a commission of leading Liverpool medical men and others has been appointed to report on the work being done in the Liverpool area in the investigation and treatment of cancer and on possible extensions and improvements of that work. The members of the Liverpool commission are: Dr. Arnold D. McNair, vice-chancellor of the university, *chair-*