

EDITORIAL

It has become one of the happy traditions of *Notes and Records of the Royal Society* that each year we have the opportunity of publishing the President's anniversary address in the June issue following its delivery. In his address for 2009, Lord Rees comments on the global nature of science. He observes how infectious diseases, climate change and the pressures of population growth raise problems for the whole world and that, as with the banking crisis, no nation is immune. The solutions, too, have to be sought in a global context. As we seek 'clean energy' options, for example, could solar power, distributed to all parts of Europe from collectors in the Sahara desert, be the answer in the long term? It is an exciting prospect. And feasible in principle, though only, as Lord Rees insists, if Europe responds to the scientific and technological challenge with the vision and investment that such an initiative would require.

It is one of the strengths of the scientific community that, with a few notorious exceptions, it has always seen itself as pre-eminently 'global' in Lord Rees's sense. In our own day, the Royal Society has Fellows and prizewinners throughout the world, and its journals (like this one) are international in both their contributors and their circulation. It was in precisely this spirit that in the eighteenth century Carolus Linnaeus conducted his botanical work with no regard for national boundaries. As Alexandra Cook shows in this issue, he eagerly sought information about Chinese plants and, in naming them, drew on indigenous names and indigenous knowledge. In making this argument, Cook defends Linnaeus against the charge of Eurocentric 'linguistic imperialism' and instead presents him and his son as fashioning a cross-cultural nomenclature that mediated between cultures rather than privileging any one in particular.

Working for much of his life in his homes and gardens in Uppsala and Hammarby, Linnaeus relied heavily on specimens and information sent to him by travellers, such as the representatives of the Swedish East India Company, and residents across the globe. Correspondence, in fact, was crucial to his achievement, as it has been to scientists of all periods. Historians are now the beneficiaries of this form of communication, as two other contributions to this issue remind us. Anna Marie Roos's study of Martin Lister's method of fluxing antimony with Derbyshire cawk-stone and the interest that Isaac Newton took in the method not only draws on the voluminous body of surviving letters to and from Lister but also throws new light on the dispersed network of correspondents to which he and other seventeenth-century virtuosi belonged and on which their work depended. The other illustration is the text of Max Born's 'Dialectical materialism and modern physics', published here for the first time, with a commentary by Olival Freire and Christoph Lehner. It was in this text, addressed to the Marxist Léon Rosenfeld in 1955, that Born, writing from a liberal non-Marxist position, set out most clearly his opposition to Rosenfeld's claim that Niels Bohr's doctrine of complementarity was compatible with dialectical materialism. As a lengthy and carefully elaborated exposition of a philosophical position intended for the eyes of one person, the text is unusual, and we can expect similar documents to become even more of a rarity in our age of easy but ephemeral electronic communication.

'Aloe africana' [*Aloe arborescens*], watercolour by George Dionysius Ehret FRS (1708–70). One of a series of aloe paintings that were among the earliest British commissions undertaken by the German-born émigré artist. The plants were grown at Chelsea Physic Garden and selected to be copied for the Royal Society by Philip Miller (1698–1771). Miller presented the completed works in May 1737. The prodigiously talented Ehret shared the project with Jacob van Huysum (ca.1687–1740) but produced the lion's share of images: 22 in all.

Elsewhere in his address, Lord Rees takes up the theme of freedom already broached by an earlier president, Aaron Klug. The freedom in question is that on which creative science at the highest level depends. It is a freedom both from the preoccupation with producing immediate results and from the pressures (referred to in Denis Noble's essay review in our previous issue<sup>1</sup>) that tend to yield conformity rather than the 'pink diamonds', scientists whose ideas are so at odds with prevailing belief as to risk rejection, even ridicule. History is rich in examples of disregarded ideas of this kind, some of them of an importance that came to be recognized long after their publication. One such instance is discussed in Donald Forsdyke's article on the theory of 'physiological selection' that George Romanes advanced in 1868 and William Bateson subsequently championed as a way of explaining the failure of breeders to produce sterile hybrids from intra-species (as opposed to inter-species) crosses. The Romanes–Bateson hypothesis found little support for more than a hundred years, but now, as Forsdyke observes, it is receiving favourable attention in the light of modern work on yeast hybrids.

In earlier editorials, I have expressed my hope that practising scientists will see *Notes and Records of the Royal Society* as a journal to which they might submit accounts of important aspects of their own work. In this issue Alan Creighton contributes to our series of 'Recollections' with an article on early research on surface-enhanced Raman spectroscopy at the University of Kent in the 1970s. Eye-witness contributions of this kind are valuable both as historical studies in their own right and as source material for future historians. I should welcome more of the same.

By the time this June issue appears, a British general election will be behind us, and the nation's funding of scientific and technological research will have been reviewed or targeted for review. As I write this, in March 2010, discussions suggest that a consensus may be emerging in favour of maintaining the research budget, whichever party forms the new government. Let us hope this is so. In these hard economic times, a consensus on funding across the political spectrum would be a signal vote of confidence in science and a moral as well as material encouragement for today's counterparts of the 'ingenious and curious gentlemen' whose founding of the Royal Society we celebrate in this 350th anniversary year.

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#### NOTE

- 1 Denis Noble, 'Funding the pink diamonds: a historical perspective', *Notes Rec. R. Soc.* **64**, 97–102 (2010).

## A SPECULUM OF CHYMICAL PRACTICE: ISAAC NEWTON, MARTIN LISTER (1639–1712), AND THE MAKING OF TELESCOPIC MIRRORS

by

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In 1674 the natural philosopher and physician Martin Lister published a new method of making glass of antimony for telescopic mirrors, using Derbyshire cawk or barite as a flux. New manuscript evidence reveals that Sir Isaac Newton requested samples of the cawk and antimony from Lister through an intermediary named Nathaniel Johnston. An analysis of Lister's paper and Johnston's correspondence and its context reveals insights not only about Newton's work with telescopic specula but also about his alchemical investigations. Analysing these sources also contributes to our understanding of the nature of correspondence networks in the early 'scientific revolution' in England.

**Keywords:** Isaac Newton; Martin Lister; telescopes; chymistry; Republic of Letters

#### INTRODUCTION

On 22 January 1676, Nathaniel Johnston (bap. ?1629–1705) a physician, naturalist, antiquary and future Jacobite, wrote to a fellow doctor and natural philosopher Martin Lister (1638–1711), requesting some mineral samples.<sup>1</sup> Lister had published a paper in *Philosophical Transactions* in 1674 that described a new way of fluxing antimony with a material called Derbyshire cawk. Johnston asked whether Lister could send samples of his chymical reactants and products by post to Cambridge.<sup>2</sup> The materials were not for him but for 'Mr. Newton', who was interested in them for their chymical properties and to create the mirrors for his reflecting telescopes.

Johnston and Lister had been friends for many years, and were both members of the York Virtuosi, a salon established by the glass painter Henry Gyles (1640–1709) that met at the artist's house in Micklegate. Other members included the artists Francis Place and William Lodge, the Leeds antiquary Ralph Thoresby, the mathematician Thomas Kirke, the doctor Dr John Place (relative of Francis and subsequently physician to the Grand Duke of Tuscany) and the publisher and print seller Pierce Tempest.<sup>3</sup> Not only did the group of northern virtuosi meet about literary and artistic matters, but several members were

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