BRITISH AND AMERICAN CONTRIBUTIONS TO ELECTRICAL COMMUNICATIONS*

By E. A. MARLAND

Edward Allen Marland presents a survey of interesting milestones in the history, and pre-history, of telecommunications. He starts by describing how some in the 16th and 17th centuries believed that needles magnetised from the same lodestone could enable communication at a distance – when one moved, so would the other. However, he seems here to have included magnetic communication only for its curiosity value, rather than for any light it sheds, in his account, on the development of electrical communications.

Moving into the 18th century, Marland comments that: 'Eventually, the electromagnetic telegraph was approached via the phenomena of static electricity rather than magnetism.' This deterministic sentiment seems to assume that the eventual outcome was both intended and inevitable; as such Marland's account shares much with other histories written by engineers about their own disciplines, for example the early historians of the telephone J. E. Kingsbury (1915), and F. G. C. Baldwin (1925). Indeed this is Marland's background, having studied engineering at Nottingham before the Second World War and taught physics and electrical engineering afterwards.

Marland then mentions two important developments from the early 19th century: the invention of the Voltaic pile and Oersted's discovery of the effect of electricity on magnets. He then tells the stories of the Bavarian and the Russian – Sömmering and Schilling respectively – whose early work resulted in a sort of experimental demonstration model of the telegraph, and the Englishmen – Cooke and Wheatstone – and the American – Morse – who brought telegraphy to a state of commercial viability. A couple of years after Marland's publication Geoffrey Hubbard (1965) provided more detail on this story. Marland next provides an informative account of the laying of the Atlantic telegraph, the social and economic aspects of which have since been elucidated by Hugh Barty-King (1979), Daniel Headrick (1988 and 1991), and Gillian Cookson (2003).

Rich in information and detail regarding instruments and apparatus, Marland's is essentially a summarised technical history, paying less attention to the social or economic context within which these technologies were developed. He spends only one paragraph mentioning some key early uses of the telegraph, and he does not go into detail regarding the systems and networks which were vital to the use of such communications technologies. Since then, many scholars have worked on these aspects, such as Jeffrey Keive (1973), who evaluated the social and economic history of the telegraph, and Iwan Rhys Morus (1991, 1996) and Richard Noakes (1999, 2002), who have written about the interface between telegraphy and culture, including spiritualism.

Marland's history ends with Bell demonstrating his first telephone instrument at the 1876 Centennial Exhibition in Philadelphia, but the success of telephony at this point was not inevitable. Subsequent social histories have dealt with the spread of telephony in more detail, for example Ithiel de Sola Pool (1977), whose edited volume is very influential, Carolyn Marvin (1988) and Claude Fischer (1992). More recently, scholars such as Graeme Milne (2007, 2010) have begun to consider telephone users as influential in shaping the development of telephony, especially in the commercial sphere. My own research broadens out this perspective to include different groups of users interacting with different early forms of telephony following its introduction into Britain.

Although Marland's article does not appear to have been that influential, this is probably because, two years later, his book *Early Electrical Communication* provided an expanded treatment of the subject. This has been cited more widely, including by the journalist Tom Standage in his popular 1997 book *The Victorian Internet*. Recently, studies such as Jon Agar's 2003 history of the mobile phone, *Constant Touch* have also brought the study of electrical communication into the 21st century.

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Editors' picks

Simon Schaffer picks his top 5 articles from the *BJHS* archives...

A tough brief indeed.

- David Bloor, 'Polyhedra and the abominations of Leviticus', **11** (1978), 245-72
- Sophie Forgan, 'Context, image and function: a preliminary enquiry into the architecture of scientific societies", **19** (1986), 89-113
- Deborah Jean Warner, 'What is a scientific instrument, when did it become one and why?' **23** (1990), 83-93
- John Christie, 'Aurora, Nemesis and Clio', **26** (1993), 391-405
- Anne Secord, 'Corresponding interests: artisans and gentlemen in nineteenth century natural history' **27** (1994), 383-408

and, because cheating might be allowed, here are the next five:

- D T Whiteside, 'Newton's early thoughts on planetary motion: a fresh look', **2** (1964), 117-37
- Dorinda Outram, 'Politics and vocation: French science 1793-1830', **13** (1980), 27-43
- Jack Morrell, 'Wissenschaft in Worstedopolis: public science in Bradford 1800-1850', **18** (1985), 1-23
- William Ashworth, 'The calculating eye: Herschel, Babbage and the business of astronomy', **27** (1994), 409-41
- Alistair Sponsel, 'Constructing a revolution in science: the campaign to promote a favourable reception for the 1919 solar eclipse experiments', **35** (2002), 439-67

and I didn't even get to include Joseph Needham's extraordinary and ridiculously self-indulgent opening address at the 1977 International Congress of the History of Science, which I heard at the first such event I ever attended, and is printed in *BJHS* **11** (1978).

GREEK ASTRONOMY AND ITS DEBT TO THE BABYLONIANS*

By LEONARD W. CLARKE

The 20th century saw a gradual but significant shift in our understanding of the early history of astronomy, away from an account looking solely to the ancient Greeks to one that included other ancient cultures as well. Leonard Clarke's paper in the inaugural issue of *BJHS* was an important and self-conscious step in this process. It agues that there was an advanced mathematical and observational astronomy prior to the Greeks in ancient Babylonia and that subsequent Greek work, all the way down to Ptolemy, was significantly indebted to the Babylonians. While this sort of view was not original to Clarke, it is well argued here and reaches a wider audience than some of the preceding more specialised and technical studies.

Of particular importance is Clarke's argument concerning the 'Chaldean astrologers'. Until this paper, it had been common to dismiss Babylonian work on the heavens as merely astrological and of no importance to the history of astronomy. Clarke does not deny the Babylonian work was astrological, but argues that it was not in the main concerned with personal horoscopes, but with predictions of the motions of the heavens that allowed more general portents to be made. Those predictions involved close observation of the heavens and mathematical calculations to generate the predictions which had intrinsic merit and were useful for the subsequent history of astronomy. Clarke further argues that there was also a transmission of ideas about how the heavens were structured and of some of the instruments used in the observation of the heavens.

One of Clarke's strategies here has become commonplace in discussions of the relation of Greek and Babylonian science in later years, which is to question how sharp the traditional supposed differences are between the two cultures. It is not the case, he argues, that the Babylonians did astrology while the Greeks did astronomy. As we have seen, the Babylonian activities involved a type of astrology but also involved observation, mathematics and prediction. The Greeks, on the other hand, had a significant interest in astrology which in some cases was not sharply distinguished from their interest in astronomy. While the Greeks may have been strong in geometry and theoretical mathematics, the Babylonians had a strong practical mathematics, were aware of practical applications of many results that the Greeks later proved more generally and, in some ways, for practical purposes the Babylonians had a superior place number system. Observation seems to have been more important to the Babylonians than to the early Greek philosophers in their study of the heavens.

The debates on whether Thales, the sixth century BCE Greek philosopher, forecast an eclipse, how precise that prediction might have been and how he made the prediction have gone on. There is probably some sort of a consensus now with the position that Clarke argues for here, that Thales did make the prediction, that it was relatively vague (eclipse this year, rather than type of eclipse and date) and that he did so through some knowledge of the Babylonian records and predictions.

To back the transmission of astronomical ideas between the two cultures, Clarke argues that there was more contact and transmission of ideas between ancient cultures than was generally realised at the time and looks at the transmission of information in related fields such as calendar construction. Oriental influence on early Greek culture became, and to some extent still is, a strongly contested area.

Since Clarke's paper, studies in this field have changed considerably. There has been a vast expansion of our knowledge of ancient Babylonia, both in terms of the technical astronomy with its observations, predictions and mathematical methods as well as its social setting. In particular, much work has been done on the nature of what we might rather loosely call the astrology of Babylonia in trying to understand what the Babylonians thought they were doing when they investigated the motions of the heavens.

There has also been a major change in the historiography, in no small part due to the papers published in a special edition of *Isis* in 1992 on the *Cultures of Ancient Science*. Greek science is now not seen as the only ancient science or as the ultimate root of Western science. A further small but highly significant shift in historiography since then has been to look at what the Babylonians did as a matter with its own intrinsic interest, rather than simply as a precursor. So we attempt to examine and reconstruct what the Babylonian projects may have been in various fields, rather than simply look for information and methods that the Greeks may have found important.

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Editors' picks

Janet Browne picks her top 5 articles from the *BJHS* archives...

- Steven Shapin, 'Personal development and intellectual biography: the case of Robert Boyle', **26** (1993), 335-45
- Anne Secord, 'Corresponding interests: artisans and gentlemen in nineteenth century natural history' **27** (1994), 383-408
- Martin Rudwick, 'Charles Lyell speaks in the lecture theatre', **9** (1976), 147-55
- Hugh Torrens, 'Mary Anning (1799-1847) of Lyme; the greatest fossilist the world ever knew", **28** (1995), 257-84
- Soraya de Chadarevian, 'Laboratory science versus country-house experiments. The controversy between Julius Sachs and Charles Darwin', **29** (1996), 17-41

Sorry these are all from way back. But they each have a story behind them for me. They each hold some special personal memory and reflect my appreciation of the author's historical skills. They each have special merits. Anne Secord's paper was instrumental in bringing artisanal naturalists into focus. Martin Rudwick achieved something fresh and new in delivering one of Lyell's lectures in person. Hugh Torrens gave a wonderful BSHS presidential address on Mary Anning that turned into a major investigative project. Then Soraya de Chadarevian showed us that Darwin was a country-house experimentalist on the outskirts of the laboratory revolution. And Steven Shapin's paper reveals his commitment to taking the construction and presentation of a life seriously.

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