NATURE

A WEEKLY JOURNAL OF SCIENCE

"To the solid ground
Of Nature trusts the mind that builds for aye."—WORDSWORTH.

SATURDAY, JANUARY 6, 1934

No. 3349 Vol. 133

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A Hundred Years Ago

ON another page in this issue will be found the names of some of the most notable men of science, engineers and inventors who died in 1834. The list, although it is not an exhaustive one, is representative, and recalls the activities of some of those who lived in the first third of the nineteenth century, a period which was marked by a great increase in scientific studies, in the number of scientific and technical journals and in the list of scientific societies. It was, moreover, a period which ushered in those revolutions in transport and communication which will always render the nineteenth century memorable.

The year 1834 was perhaps not marked by any such epoch-making event as the inauguration of regular steam navigation by Fulton in 1807, the discovery of electro-magnetism by Oersted in 1819, or the opening of the Liverpool and Manchester Railway in 1830, but the immense activities of the time are reflected in the pages of many publications, in the records of Patent Offices, and in the proceedings of Parliament. The world was just beginning to reap the harvest sown in the eighteenth century by such men as Franklin, Cavendish, Black, Lavoisier, Arkwright and Watt, and men's minds were filled with the possibilities of still richer rewards to be gained. The achievements of our own days, it must be said, far surpass the visions of 1834, but there are many incidents of that time worth recalling, and during the present year we propose to record some of the

happenings—scientific, industrial and social—of 1834 such as would have been noticed in the columns of NATURE had it been founded in that year instead of 1869.

A picture of the world of science in 1834 presents many interesting details and includes many notable men. In Great Britain, among the outstanding men of science were Brewster, Lyell, Herschel, Dalton, Whewell, Babbage, Faraday, Wheatstone, Forbes, Murchison and Graham; abroad, among the most distinguished were Ampère, Arago, Liebig, Oersted, Hansen, Gauss and Humboldt. In 1834, Sir John Herschel, at the Cape, was engaged on his survey of the southern heavens; Faraday at the Royal Institution was investigating the action of the voltaic cell; Wheatstone at King's College was determining the velocity of electricity; Liebig at Giessen was making his laboratory the Mecca for young chemists, while Darwin in the *Beagle* was exploring the coasts of South America.

A century ago scientific societies were multiplying apace and the British Association, then three years old, largely through the efforts of J. D. Forbes, in 1834 held its meeting at Edinburgh. Sir Thomas Brisbane was the president a hundred years ago and among the distinguished visitors from abroad was Arago. The notable scientific books of the year included Baden Powell's "History of Natural Philosophy", Prout's "Bridgewater Treatise" on chemistry, Arago's "Astronomie Populaire" and the first part of Becquerel's "Traité de l'Electricité et du Magnetism". It was also in 1834 that the French railway engineer Clapeyron published in the journal of the École Polytechnique his memoir "Theorie mécanique de la chaleur", which was destined to lead Kelvin to search for a copy of Sadi Carnot's essay of ten years earlier.

At the same time, in the world of practical engineering great advances were being made in many directions. Improvements were being introduced in the manufacture and working of iron and steel, in the construction of machine tools and in the building of iron structures. The Stephensons, Locke, Brunel, Rastrick and others were engaged on the plans for the London and Birmingham Railway and other lines; Hancock, Maceroni, Church and Scott Russell were attacking the problem of applying steam to road vehicles, a promising line of invention the success of which was prevented partly by the railways and partly by legislation, and shipbuilders and marine engineers were planning to build steam vessels capable of crossing the Atlantic under all conditions of weather. Mails and passengers were even then carried to Alexandria by steam, and steam vessels were found in all waters, but a voyage across the Atlantic was still done under sail, occupying sometimes six or eight weeks.

The growing interest in all these matters is shown by the records of patents and by the establishment of journals appealing mainly to the engineer and mechanic. One of the journals of a century ago which combined in its pages accounts of the work of men of science with descriptions of machines and engineering practice was the *Mechanics' Magazine, Museum Register, Journal and Gazette*, briefly known as the *Mechanics' Magazine*, published first in 1823. In the preface to the first volume its editors said that:

"the object proposed by this publication at its outset was one of entire novelty and no inconsiderable importance. A numerous and valuable portion of the community, including all who are manually employed in our different trades and manufactures had begun for the first time, to feel the want of a periodical work, which at a price suited to their humble means, would diffuse among them a better acquaintance with the history and principles of the arts they practise, convey to them earlier information than they had hitherto been able to procure of new discoveries, inventions and improvements and attend generally to their peculiar interests as effected by passing events."

The successful way in which the journal fulfilled these objects led Dr. Birkbeck, at the opening of the London Mechanics Institution—now the Birkbeck College—to declare that the *Mechanics' Magazine* was "the most valuable gift which the hand of science had yet offered to the artizan".

The recognition by the editors of the *Mechanics' Magazine* of the interdependence of abstract science and mechanical progress was but a sign of the times. Scientific thought was invading many departments of human endeavour, and the advancement of science was seen to be a matter of national importance. It was this that had led to the founding of the British Association. The gibes and sallies with which the birth of the "Parliament of Science" was greeted have long been forgotten, but in recalling the events of that time we shall be reminded of the benefits which have come from the labours of some of its founders and stimulated in our attempts to further the welfare of mankind.