

Anniversaries of Science

September 3, 1752—England adopted the Gregorian calendar, making this date September 14, and at the same time changed New Year's Day to January 1 from March 25, the date of the spring equinox.

Science News-Letter, August 27, 1927

September 4, 1882—The first electric lighting service was inaugurated.

A notable group of men gathered at the station to see the switches thrown; others assembled at various buildings where the new lights had been installed, and crowds of the curious congregated around the show windows of the few shops on Nassau street that had been equipped. The appointed hour came—the switches were thrown and the lights went on.

The lighting company at the end of its first month's service was supplying fifty-nine customers; the New York Edison Company now serves 315,000 customers in Manhattan and the Bronx. The cost of electricity was then 1 cent for a 16-candlepower illumination for one hour; today 150 candlepower hours can be had for 1 cent. Forty years ago there were 1,284 lamps supplied from a station equipped with six generators of 125 horsepower each. Today the electrical load is equal to more than 21,500,000 lamps and the great Waterside stations of the company are rated at more than half a million horsepower.

—From a newspaper account of the celebration of the 40th anniversary of electric lighting service, 1922.

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September 6, 1766—Birth of John Dalton, the founder of the atomic theory.

In steam we recognize a perfectly elastic fluid, in water a perfect liquid, and in ice a complete solid. These observations have tacitly led to the conclusion which seems universally adopted, that all bodies of sensible magnitude, whether liquid or solid, are constituted of a vast number of extremely small particles, or atoms of matter bound together of a force of attraction, which is more or less powerful according to circumstances. . . .

Whether the ultimate particles of a body, such as water, are all alike, that is, of the same figure, weight, etc., is a question of some importance. From what is known, we have no reason to apprehend a diversity in these particulars: if it does exist in water, it must equally exist in the elements constituting water, namely hydrogen and oxygen. Now it is scarcely possible to conceive how the aggregates of dissimilar particles should be so uniformly the same. If some of the particles of water were heavier than others, if a parcel of the liquid on any occasion were constituted principally of these heavier particles, it must be supposed to affect the specific gravity of the mass, a circumstance not known. Similar observations may be made on other substances. Therefore we may conclude that *the ultimate particles of all homogenous bodies are perfectly alike in weight, figure, etc.*

—Dalton: *A New System of Chemical Philosophy*.

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September 6, 1778—Birth of Joseph Louis Gay-Lussac, the student of gases.

The attraction of the molecules in solids and liquids is, therefore, the cause which modified their special properties; and it appears that it is only when the attraction is entirely destroyed, as in gases, that bodies under similar conditions obey simple and regular laws. At least, it is my intention to make known some new properties in gases, the effects of which are regular, by showing that these substances combine amongst themselves in very simple proportions, and that the contraction of volume which they experience on combination also follows a regular law. I hope by this means to give a proof of an idea advanced by several very distinguished chemists—that we are perhaps not far removed from the time when we shall be able to submit the bulk of chemical phenomena to calculation.

—Gay-Lussac: *Memoir on the Combination of Gaseous Substances with Each Other*.

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PHYSICS

Do You Know about Magnets?

Here is the answer to the problem propounded in the NEWS-LETTER last week. The problem, as quoted from A. S. E. Ackermann's "Scientific Problems and Paradoxes" (London: *Old Westminster Press*), was as follows:

"Given two straight bars of steel identical in every respect with the exception that one of them is magnetized, in what way can it be determined which piece is magnetized? No third article of *any kind* is to be used. You may not even balance one or both bars on a finger or finger nail, but you may hold the bars in your hands."

This is the way to do it:

"All you have to do is to hold one bar by one end, say, vertically in your left hand. Then take the other bar in your right hand and hold it in a horizontal position. Cause one end of the right hand bar to approach the middle of the vertical bar. If no pull is felt when the bars are nearly in contact then the bar in the right hand is the plain bar and the one in the left is the magnet. The reason is, of course, that the middle of a uniform bar magnet is *not* magnetic. If, on the other hand, the magnetized bar had been in the right hand, and the plain bar in the left, then on approach a pull would have been felt, and this would have been due to one of the poles of the bar in the right hand, for the bar in the left hand could not exert a pull at its middle, even if it too were a magnet!"

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ZOOLOGY

Lizards Preserved in Paraffin

"If you think we're wax-works," he said, "you ought to pay, you know. Wax-works weren't made to be looked at for nothing. Nohow!"

"Contrariwise," added the one marked 'DEE', "if you think we're alive, you ought to speak."

Alice's dilemma would no doubt have been considerably increased had she encountered beings who looked very real and almost alive, and yet were indubitably wax-works, in the literal sense of being completely sculptured in wax. This is exactly what two workers at the American Museum of Natural History have done. G. K. Noble and M. E. Jaeckle, confronted with the troublesome fact that frogs and toads and spotted salamanders and all manner of other interesting but non-fur-bearing creatures can not be successfully stuffed and mounted by the ordinary methods of taxidermists, have solved the problem by literally pickling them in solid paraffin wax. They first remove all trace of water from the specimens by appropriate chemical means, arrange the little animals in natural positions, and soak them for several days or weeks in melted paraffin, until every tissue is thoroughly impregnated and you cannot tell where the flesh ends and the paraffin begins.

By this method reptiles and amphibians can be worked into naturalistic museum groups and made as "alive" looking as birds and fur-bearing animals, instead of being pallid corpses pickled in jars of alcohol. They keep their natural colors indefinitely, except that sometimes their eyes need to be touched up with a little gold paint.

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EVOLUTION

Abbott Mendel, Darwinian

(Extract from a letter of Gregor Mendel, written to Nægeli in 1873.)

"Gärtner was also convinced by his investigations that the masculine principle (as he expressed it) was always first affected. If that is really the case, then spontaneous hybridization in *Hieracium* should be due to a temporary disturbance, which, if it were repeated often or long continued, would finally result in the disappearance of the species involved, while one or the other fortunately organized hybrid descendant which was just suited to the existing telluric and cosmic conditions might succeed in taking up the struggle for existence with the unsuccessful and continue it through long periods until it also suffered a like fate."

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