

## Anniversaries of Science

**March 17, 1853.**—Christian Doppler died. He was a professor of mathematics at Prague. In 1842 he presented a paper on the colored light of double stars which enunciated the well-known principle which bears his name.

We have only to compare the dark-line spectra of the sun and stars with the bright-line spectra of the chemical elements, as we may easily produce them in the laboratory, to find, line for line, and in many cases even line-intensity for line-intensity, the evidences of the existence of these elements in sun and stars. The laboratory spectrum we may compare to a photographic positive, the solar and stellar spectra to negatives of the same subject. Yet though the reversal is unmistakable, there are small but highly significant differences in positions and intensities of the spectrum lines which add wonderful chapters to the story.

First there is the "Doppler effect," so-called after Christian Doppler, professor of mathematics at Prague, who pointed out in 1842 that the precise color of a shining body, like the exact pitch of a sounding one, must be changed by velocity of approach or recession. Doubtless all have heard the change of pitch of a locomotive whistle as it passes a crossing, and noticed it higher as it comes, lower as it goes away, because more vibrations reach the ear per second while the locomotive approaches, and less while it recedes. The same sort of thing holds for light, except that since light travels so exceedingly fast, more than 700,000 times as fast as sound, it takes a very high velocity of a luminous body to make any effect of this kind that can be noticed. However, the speed of the sun towards the stars of the constellation Hercules, about 12 miles a second, and the difference of over 2 miles a second between the speed of approach and recession of the sun's western and eastern edges, due to the sun's rotation on its axis, are easily measurable.

—Abbot: *The Earth and the Stars.*

**March 18, 1907.**—Marcellin Pierre Eugene Berthelot died. He was professor of organic chemistry in the College de France and secretary to the Paris Academy of Sciences. He made important researches in thermo-chemistry, explosives, and synthetic chemistry.

One of the characteristic Phenomena accompanying a chemical change is an evolution or absorption of heat; in other words, the amount of heat contained by the reacting system changes with the chemical change. The measurement of this heat change, which may range from a large negative quantity through zero to a large positive quantity, is the province of thermo-chemistry. Our knowledge of these heats of reaction is largely due to Thomsen and to Berthelot, each of whom started from the supposition that the heat effect is a direct measure of relative affinity; and it was with this end in view that they carried out the very laborious work involved in these determinations. It is now clear that this supposition is erroneous, that the maximum work producible by a reaction,

or its free energy, is a truer measure of affinity, the heat effect being an important factor in this maximum work or free energy.

—Johnston: *Chemistry in The Development of the Sciences.*

**March 20, 1727.**—Sir Isaac Newton died.

Here Lies  
SIR ISAAC NEWTON, KNIGHT,  
Who by a vigor of mind, almost supernatural,  
First demonstrated  
The motions and figures of the Planets,  
The Paths of the Comets, and the  
Tides of the Ocean.  
He diligently investigated  
The different refrangibilities of the Rays of  
Light  
And the properties of the Colors to which  
they give rise.  
An Assiduous, Sagacious, and Faithful  
Interpreter  
Of Nature, Antiquity, and the Holy  
Scriptures,  
He asserted in his Philosophy the Majesty  
of God, and exhibited in his Conduct the  
simplicity of the Gospel.  
Let Mortals rejoice that there has existed  
such and so great  
An ornament of the Human Race.  
Born 25 Dec., 1642; Died 20 March, 1727.  
—Inscription on Newton's monument in  
Westminster Abbey.

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## ARCHAEOLOGY King's Funeral in Ur Find

A fragment of carved limestone is one of the most important finds just announced from ancient Ur of the Chaldees where excavations are being made by a joint expedition of the University of Pennsylvania and the British Museum.

A report just received from C. Leonard Woolley, director of the expedition, states that this remarkable bas relief probably represents the funeral procession of a prehistoric king.

"The relief," he states, "shows a chariot drawn by four lions. It is empty, and the reins are held by a man who walks behind, while another guides the way in front and a third follows carrying some kind of burden. Over the car is thrown a leopard's skin, and to the front of it are tied spears, a quiverful of arrows, and a battle-axe, the panoply, perhaps, of the dead ruler. It is an extraordinarily interesting fragment."

Mr. Woolley's latest discoveries have been made at a cemetery older than any of the houses which have been uncovered at Ur. The latest of the graves in the main cemetery date back to before 3000 B. C., more than 1,000 years before Abraham lived in the city. The oldest of the graves, which lie 15 to 20 feet below the surface, are said by Mr. Woolley to be some 500 years older.

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## PSYCHOLOGY

### Twelve-Day Noise Test

A noisy office makes a slow stenographer. This is one of the conclusions which may be drawn from the twelve-day noise test in progress at the psychological laboratory of Colgate University.

Every day for two weeks, Miss Elsie Keller, speed typist, has been pounding out letters while a noise machine manufactured office and street sounds within five feet of her chair. Half the time she worked in a laboratory where the sounds echoed and vibrated around the room. The other half, the brick walls of the laboratory were covered to deaden the vibrations to about half their original strength.

Dr. Donald Laird, professor of psychology at Colgate, who conducted the experiment, finds that an expert typist may be able to keep her accuracy at high pitch even when a room is full of noise and confusion. But the greater effort required drains her energy, and slows down her speed. Final results are expected to show considerable differences between typing done in noisy conditions and that done in comparative quiet.

"The hardest work I ever did," is Miss Keller's comment on the ordeal of typing steadily at around 100 words a minute to the tune of automobile horns, telephone bells, and sounds resembling office typewriters and office conversation.

Dr. Laird declares that at the noisiest, his laboratory is no worse than many offices where typists regularly spend their working hours.

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## PSYCHOLOGY

### Parents Poor Judges

The ratings given by parents and friends are of little use in judging the ability of students to do college work, according to Dr. E. L. Clark, director of admissions at Northwestern University. The filling out of information blanks by parents or friends has proved to be of little value in determining whether these students would be able to keep up to college standards if admitted, he says. Neither does the age of a student at entrance, nor the nationality of his parents have much relationship to grades. Of more value is information concerning failures the student may have made in high school, especially in courses required of college freshmen, though standing in the smaller schools is not so much to be depended upon as standing in the larger schools. Information concerning the number of high schools attended is also of value.

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