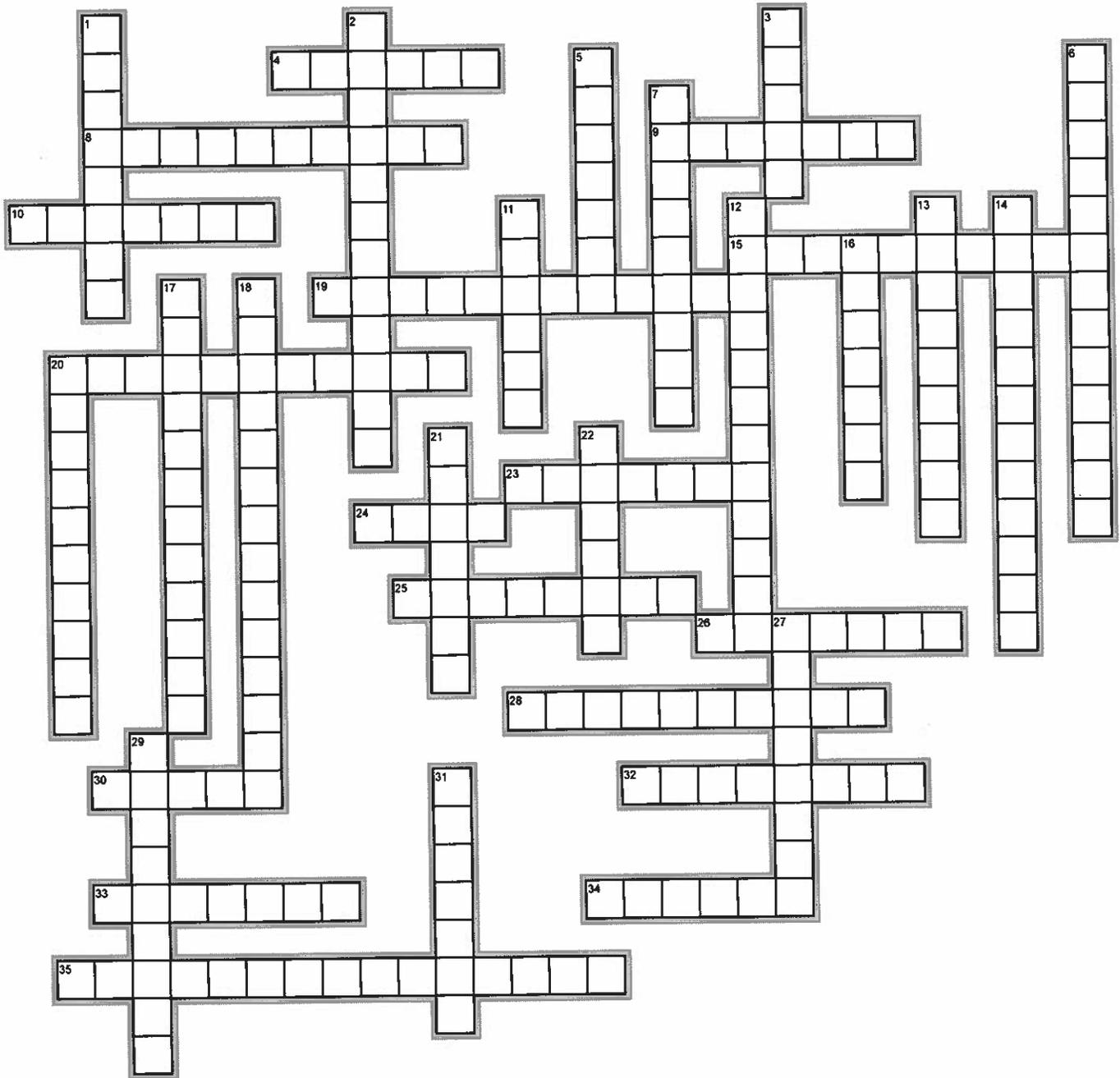


Nobel Prizes 1920 to 1930

Dr. Thomas Manning



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Across

4. Arthur _____ was a co-recipient of the 1929 Nobel Prize in chemistry. Some of his work on glycolysis reactions in yeast. Glycolysis is a pathway that transforms glucose into pyruvate.
8. In 1924 the Nobel Prize in chemistry was not awarded. The previous decade witnessed a World War that impacted all levels of society. The roaring 20's was a period of increased wealth, a mass migration from farms to cities, the introduction of new music (jazz) and dances (the _____), and the inception of prohibition.
9. The 1923 Nobel Prize for Chemistry was awarded to Fritz Pregl for his work with developing methods associated with quantitative _____ micro-analysis.
10. Adolf Windaus won the 1928 Nobel Prize in chemistry for his work with _____. His work included the synthesis of vitamin D.
15. Vitamin B6 is called _____ and helps form red blood cells.

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19. Fritz Pregl outlined his work in monographs entitled Die quantitative _____ (s). These were several hundred pages long and attracted attention internationally.
20. In 1912 approximately 15 % of U.S. households had _____; by 1925, it jumped to over 60 %. The widespread distribution of power helped the chemical industry immensely.
23. _____₂₃₅ and _____₂₃₈ can be detected by mass spectrometry because they have different m/z ratios, but in many cases they will have the same charge (+1).
24. The 1927 Nobel Prize in chemistry was centered on the chemical composition of _____ acids. Heinrich Otto Wieland was the recipient.
25. In 1925 the Nobel was awarded for the development and fundamental understanding of _____. The prize was awarded to Richard Adolf Zsigmondy.
26. The theory of relativity has two components; Special relativity and general relativity. They were first proposed in 1905 and published in 1915. Special relativity applies to systems where _____ is not considered.
28. In a mass spectrometer (MS), ions are generated using an _____ field and focused with a magnetic field. A neutral species, atomic or molecular, can not be focused or aimed at the MS detector with a magnetic field.
30. In 1921 Frederick _____ was awarded the Nobel Prize in Chemistry for his work with isotopes and radioactivity. He worked at Oxford, which is in England.
32. Vitamin D is also called the _____ vitamin. Vit. D is synthesized in the body when skin is exposed to the sun. Typically 15 minutes of sunshine 3 times a week produces enough Vit D
33. Hans Karl August Simon von Euler-Chelpin was a co-recipient of the 1929 Nobel Prize in Chemistry for setting a foundation that resulted in the understanding of the processes occurring in _____ related to the supply of energy.
34. de Broglie Equation has a constant symbolized by and "h" and has the units Joules seconds. "h" is the _____ constant.
35. LC-MS is widely used in many fields of science and technology as a chemical identification technique. Groups of molecules such as herbicides, pesticides, dyes, polymers, genetic (DNA, RNA), proteins, carbohydrates, fatty acids, elements, and _____ are widely studied both qualitatively and quantitatively by LC-MS.

Down

1. Insulin is synthesized by a _____, and controls the glucose concentration in your serum.
2. Soddy, the 1921 Nobel Laureate, was one of several scientists credited with the discovery of the element _____ in 1917. Its elemental symbol is Pa. It is an actinide and its longest lived isotope Pa-231, has a half-life of 32,000 years.
3. Manne Siegbahn won the 1925 Nobel Prize in Physics for his work with _____ spectra and their generation and interaction with atoms. As a region x-rays have less energy than gamma rays, and more energy than UV, Visible and IR light (aka electromagnetic radiation).
5. The 1927 Nobel Prize in Physiology or Medicine 1927 was awarded for a treatment of _____, a mosquito borne disease. Julius Wagner-Jauregg was the recipient. During World War 2, 1/2 million US troops in the Pacific and SE Asia theaters were infected with the parasitic disease.
6. In 1921 Albert Einstein won the Nobel Prize in Physics for the _____ effect. He is more famous for his work developing Special Relativity and could have also won it for this work with Brownian motion. Einstein was a theoretical physicist.
7. Related to 1930 Nobel Prize in Chemistry; Hemin is a _____ containing a ferric iron (Fe(III)) ion linked to a chloride ion. Porphyrins are essential for the function of hemoglobin.
11. m/z or mass/_____ is used as a unit in mass spectrometry. For example, water molecule has a mass of 18 g/mol and would need a +1 charge to be detected in a mass spec. This is achieved by knocking an electron from the water molecule: $H_2O + \text{electrical field} \Rightarrow H_2O^+$
12. Francis W. Aston was awarded the Nobel chemistry prize in 1922 primarily for his invention of the mass _____. It measures the mass to charge ratio using a magnetic field operated at very low pressures (i.e. < 0.000001 atm's).
13. _____ is a disorder that occurs when there is an increase of natural chemicals that produce porphyrin.
14. Pregls techniques could measure the mass percent of carbon, chlorine, hydrogen, nitrogen, and sulfur in samples very accurately and precisely. He also developed a _____ that could measure masses at the microgram level (note, there were no electronics in the 1920's).
16. In 1923 Frederick Banting and John Macleod won the Nobel Prize for Physiology/Medicine for the discovery of _____.
17. Vitamin D is a group of fat-soluble _____. They increase absorption of Ca, Mg, and phosphate in

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the GI tract. The most important Vitamin D's are D3 and D2.

18. Today mass spectrometers are used as a detector, while LC or liquid _____ is the method of separation in a LC-MS.
20. Yeasts are _____, single-celled microorganisms that are part of the fungus kingdom. _____ cells have a nucleus and are in animals, plants, and fungi.
21. A _____ consists of minute, insoluble particles that are evenly dispersed and suspended in another substance. An example of this is milk with protein and fat aggregates suspended in the liquid phase.
22. The 1930 Nobel Prize in Chemistry was awarded to Hans Fischer for his work with _____ (aka Hemin) and chlorophyll.
27. The sterols are a group of naturally occurring unsaturated steroid _____ with many of them being waxy solids.
29. Vitamin K prevents blood cells from sticking together, also called _____.
31. The 1929 Nobel Prize for Physics was awarded to Louis de _____ for the discovery of the wave nature of electrons. In his 1924 PhD thesis, de _____ outlined the wave nature of electrons. He also suggested all particles have wave properties.

