relativity theory and are thought by many to justify our attaching importance to that theory, but it is seen that they may be regarded as having another and earlier origin.

A devotes about one sixth of his book to modern physics, including the quantum theory—the outstanding theory of our time. B would give the major portion of his book to modern physics. The discovery of x-rays in 1895—what a burst of scientific activity followed! It is frequently stated that this discovery was accidental—but it was no accident that Roentgen was trying to find more facts connected with the discharge of electricity through a very rare gas. The discovery of x-rays led (1896) directly to that of the Becquerel rays from uranium; this again led (1898) directly to the discovery of radium. In the meantime (1897) the electron was discovered by J. J. Thomson, but its clear identity was not established without using the property of x-rays in ionizing a gas.

X-rays, the electron, radium—what a new world came into being! The atoms of chemical elements hitherto indivisible, indestructible units, definite for every element, had at least common constituents, electrons. But Rutherford and Soddy, working with radium, set forth the view that the radioactive, also the heaviest, atoms shot out either helium atoms or electrons and were thereby transformed into atoms of their chemical neighbors. Natural transmutation of the elements undreamed of before the present century, even by alchemists, came into our vision.

In the meantime, another line of experimental work had established certain laws regarding radiation from a hot source. To satisfy these laws Planck (1900) found it necessary in his theory to introduce the idea that radiant energy was tied up in bundles. The experimental physicist (B) would place great emphasis upon the quantum theory, for practically all phenomena are in accord with it. To change our point of view regarding radiant energy from being a phenomenon of continuity to one of discontinuity, from being one of wave motion to one of atomicity was to bring about one of the most important steps in the evolution of physical thought.

The chapter dealing with the evolution of our ideas regarding an atom would be a very long and important one in B's book. It would begin with the post-Dalton pre-electron atom, the perfectly elastic sphere (?), the atom which accounts for the properties of gases, it would continue with the post-electron pre-nuclear atom, the pumpkin atom, then with Rutherford's great contribution, the nuclear solar system atom, with the atom of definite energy levels initiated by Bohr. Here the evidence regarding energy levels becomes bewildering in its complexity, the evidence brought out by atomic spectra due to visible radiation, infra red, ultra violet, x-rays. If B would continue with the arrangement of atoms in molecules, as evidenced by molecular spectra, the Zeeman and Raman effects—this chapter might become a volume.

B would necessarily give space to the exceedingly accurate measurement of the mass of an atom, by Aston, Dempster and others, to the evidence that an element may have several different kinds of atoms, that besides the outer electrons the nucleus, minute in size, must contain protons (hydrogen nuclei) and neutrons and that the atoms of an element differ only in the number of the neutrons, the atoms of different elements only in the number of protons. That expulsion of a proton or a neutron may be brought about by atomic projectiles—that we may have artificial transmutation and radioactivity. No alchemist in his wildest moments even dreamed of all of this!

B would necessarily point out that the enormous growth of our ideas in modern physics is due to techniques and experimental devices which have done for modern physics what the telescope did for astronomy, the microscope for bacteriology, the spectroscope for all sciences. The outstanding modern devices are the Wilson cloud chamber, which enables us to see the path of an atom or electron, the electrometer, the Rutherford-Geiger-Müller tube, which has extended our ability to measure small electric currents (one electron a minute) a millionfold, the Lawrence and Livingston cyclotron, which enables us to hurl atoms about as in a sling shot with enormous speeds. And the electron tube—what has it not done for all science and human relations; the amplifier that has made possible the measurement of minute currents in the brain, the oscillator that generates electric waves of all frequencies, the device that has made possible instantaneous intercommunication between all peoples on this earth, the necessary component of a thousand modern devices—has it no place in the evolution of physics?

So physics, starting with Archimedes' lever and with the extremely limited world of the tangibles, has reached out "farther than ever comet flared or vagrant stardust swirled" and has bored into the minutest realms which the mind can picture. Always rigid and exacting, it has led the human race into our modern fairyland.

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FOLSOMOID POINT FOUND IN ALLUVIUM BESIDE A MAMMOTH'S BONES

UNDER conditions similar to those of other recently reported finds[1, 2] mammoth bones and a Folsomoid

[1] J. D. Figgins, *Proc. Colo. Museum Nat. Hist.*, 12: 2, 4–8, plates 1–2, 1933.

[2] E. H. Sellards, *Bull. Geol. Soc. Amer.*, 49: 999–1010, plates 1 and 3, July 1, 1938.

point have been found together in a locality about thirty miles southwest of Abilene, Texas. This site lies on a dry branch of Mulberry Creek, where an alluvial cap on bed-rock has been eroded by the channel of the stream.

The site was discovered by Cyrus N. Ray in July, 1929, and reported by him in 1930 as a locality where he had found channeled points.[3] In that report several generalized Folsom and other flint artifact types found in this place were described, and illustrated, as well as the center of one Folsom point similar to those found at the original locality.

In this site in 1935 Ray found a mammoth's skeleton embedded in a hummock of gravelly earth overlying bed-rock[4] and with the assistance of Dr. E. H. Sellards and Dr. Otto O. Watts, the mammoth's teeth were removed. At that time only a small excavation was made in the bank, of sufficient size to remove the teeth.

On July 4, 1938, while on an inspection tour of the deeply buried sites discovered by Cyrus N. Ray, Kirk Bryan and Samuel Vaughan were conducted to the site, and while Bryan and Ray were inspecting the outcropping bones, Vaughan noticed about an inch of the exposed base of a flint dart head firmly embedded in the red earth of the bank, on the same level as the bones, and on the north edge of the small hole excavated by Drs. Sellards, Ray and Watts in 1935.

Although smaller, the point is of the same general appearance as those reported and figured by Figgins and Sellards in recent publications. It is distinctly different from most of the points found with bison at either the original Folsom locality or at the Lindenmier site.[5]

On July 14, Ray and Bryan began a joint excavation at this place, which was directed by T. N. Campbell, assisted by Vaughan and some local laborers.

A trench 40 feet long was dug, and additional shallower holes were made to expose the bones. Only one flint chip was found. The number and disposition of the bones show that they were brought to place by the stream that deposited the gravel enclosing them and the finer-grained reddish alluvium overlying them. The Folsomoid point must have been carried by the same current. The alluvium of this locality overlies bedrock and has a variable thickness reaching 10 feet. It is hard and compact with limey concretions and thus has a considerable antiquity. It is an interesting speculation that the Folsom point may have been located in the fleshy part of the head, but the excavation of the site affords no definite evidence to this effect. It is, however, fair to conclude that the Folsomoid point is as old as the mammoth-bearing alluvium, which also contains remains of other, as yet unidentified, animals.

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STILBOMETOPA PODOPYSTYLA (HIPPOBOSCIDAE) FROM THE MOURNING DOVE

IN September, 1937, a specimen of *Stilbometopa podopystyla* Speiser was collected from a mature eastern mourning dove (*Zenaidura macroura carolinensis*) taken in the vicinity of Peru, Nebraska. The species determination was made by Dr. Alan Stone, of the U. S. National Museum, and the specimen was later deposited in the collection of the Museum of Comparative Zoology at Harvard University.

A search of the literature reveals only two other records of hippoboscid flies from North American doves. Bequaert[1] records the same fly (*S. podopystyla*) from a white-winged dove, *Melopelia asiatica* (L.), and Herman[2] collected *Ornithoica confluenta* Say from mourning doves taken on Cape Cod.

The finding of hippoboscid flies on mourning doves is of interest in that the natural vector of their Haemoproteus parasites has not been determined, although certain species of these flies are known to be vectors of the pigeon and quail Haemoproteus, and Huff[3] has shown experimentally that the pigeon fly (*Pseudolynchia maura* Bigot) can transmit the dove Haemoproteus to the pigeon.

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QUOTATIONS

COOPERATION BETWEEN THE BRITISH AND AMERICAN ASSOCIATIONS

IT is probable that Lord Rayleigh's term of office will mark one of the most momentous periods in the long history of the British Association. To take the initiative in forming a division to deal with the social and international relations of science is to undertake an onerous and responsible task for which the association is peculiarly fitted, and in which it will have the good wishes of all who realize the effect that advances

[3] Cyrus N. Ray, *Bull. Texas Archeol. and Paleont. Soc.*, 2: 45–46, plate 10, Sept., 1930; Nos. 3, 4, 5, 6, 7 and 10.

[4] Cyrus N. Ray, *Bull. Texas Archeol. and Paleont. Soc.*, 7: 127–129, plate 17, 1935.

[5] F. H. H. Roberts, Jr., "A Folsom Complex," Preliminary Report on Investigations at the Lindenmier Site in Northern Colorado, Smithsonian Institution, 1935.

[1] Bequaert, *Rev. de Ent.*, 5: 322–325, 1935.

[2] Herman, *Bird-Banding*, 8: 161–166, 1937.

[3] Huff, *Amer. Jour. Hyg.*, 16: 618–623, 1935.