

changes that seem to have produced in America the highly specialized modern *Equus* from his diminutive, four-toed predecessor, the Eocene *Orohippus*. The line of descent appears to have been direct and the remains now known supply every important intermediate form. It is, of course, impossible to say with certainty through which of the three-toed genera of the Pliocene that lived together, the succession came. It is not impossible that the later species, which appear generically identical, are the descendants of more distinct Pliocene types, as the persistent tendency in all the earlier forms was in the same direction. Considering the remarkable development of the group through the entire Tertiary period, and its existence even later, it seems very strange that none of the species should have survived, and that we are indebted for our present horse to the old world.

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To these four particles there might be added the alpha particle, which is the heart or nucleus of the helium atom, with a mass about four times that of the proton or heart of the hydrogen atom. It is considered to be a unit used in atom building. Prof. G. Gamow, the Soviet authority in atomic structure, says that atomic nuclei are composed of neutrons and alpha particles, with one proton in atomic hearts of odd atomic number.

The photon must have a place in any list of fundamental "particles." It is the unit of light and other electromagnetic radiations, such as X-rays and gamma rays. It is possible to think of light as consisting either of waves or particles, as most convenient at the time. Or under quantum theory and wave mechanics, the newer developments of physics, it is possible to think of the fundamental entities as not waves or particles, but mathematical equations.

How speedily the theory and experimental facts of physics move these days is shown by the opening phrases of a survey of research on neutrons contributed by the Bell Telephone Laboratories physicist, Dr. Karl K. Darrow, to the Review of Scientific Instruments, February, 1933, issued on Friday, Feb. 17: "The discovery of what may prove to be the third and last of the fundamental corpuscles of matter, and what at any rate is a distinctive kind of ionizing ray (neutrons) . . ."

As this was being published came

the cabled news of the enthronement of the positive electron, the fourth fundamental corpuscle.

Negatron or Positron?

When the London correspondent of Science Service cabled the news of the confirmation by the British physicists, the news was specially relayed by telegraph to Dr. Anderson with the suggestion: "Why not christen your new particle 'positron'?"

"With regard to your suggestion," Dr. Anderson wired in reply, "we have already discussed here negatron and positron.

"Historically and derivatively the word, electron, denotes the unit charge, positive or negative, without any reference to the associated mass. The discovery that there exists a positive charge which, like the free negative electron is unassociated with any mass of atomic magnitude, requires the introduction of a new term to distinguish it from the proton which is used to denote the positive electron associated with the mass of the atom of hydrogen. We have been discussing in the laboratory for some months past the desirability of calling the free positive electron, positron, and then using the similar contraction, negatron, for the free negative electron. This makes a logical and systematic notation which should be introduced if and as soon as the existence of the free positive electron becomes established.

"If the observations obtained here, part of which are already published, are actually due to positrons then we have new experimental evidence that in passing through matter positrons lose energy more rapidly than do negatrons."

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PHYSIOLOGY

Secretion From Crustacean Eyes Causes Color Change

RESEARCHES on a melanin-regulating hormone in the eyestalks of crustacea, (SNL, Jan. 7, '33, p. 12) were inadvertently credited to Prof. Lloyd M. Bertholf of Western Maryland University and the University of München, whereas the actual authors of the report were Prof. Earle B. Perkins and Benjamin Kropp of Rutgers University.

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Grapefruit and orange production in the world has increased ten-fold in the past 40 years.

ASTRONOMY

Small Telescopes Reveal Comet Just Reported

A COMET that may become visible to the unaided eye was discovered early Thursday, Feb. 16, in the northern evening sky by Leslie C. Peltier, an amateur astronomer of Delphos, Ohio, the Harvard College Observatory has been informed. It was eighth magnitude and sufficiently bright to be visible through small telescopes or high powered field glasses.

This discovery was confirmed by other observatories.

The comet was observed between the constellations of Cepheus and Cassiopeia in the region of the Milky Way and is moving eastward.

Mr. Peltier is a veteran comet discoverer.

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SURGERY

Grafted Nerves Restore Normal Facial Expression

SIXTEEN patients with hideously twisted, paralyzed faces have had normal expressions and the use of facial muscles restored to them by a newly-improved nerve-grafting operation.

The operation was developed by Dr. Arthur B. Duel of the Manhattan Eye, Ear and Throat Hospital in New York, and Sir Charles Ballance, for many years surgeon-in-chief at St. Thomas' Hospital, London. Dr. Duel has described the operation in a report just published here by the Milbank Memorial Fund which, with the Carnegie Corporation, the Lillia Babbitt Hyde Foundation, the New York Foundation and a number of the surgeons' personal friends, gave the necessary financial support to the research.

In Dr. Duel's opinion, the restoration of facial movements is not only a great boon to a patient's morale in his social contacts, but is also of tremendous importance in making him self-supporting.

The new operation gives the patients the ability to use their facial muscles either voluntarily or in response to their emotions. They can put on a polite, society smile or laugh spontaneously at a funny story. Both factors are important, Dr. Duel pointed out.

Dr. Duel and his collaborator worked first with animals. They found that grafts of nerves from other parts of