tau particles, one with a positive and one with a negative charge, and K pi-two, either positively or negatively charged.

The third set consists of those with higher masses than protons. Called hyperons, they are lambda zero, negative xi, and two sigma's, positively and negatively charged.

Completing the list of 21 accepted particles besides the electron, proton and neutron are the positron, a positively charged electron, and the neutrino, a tiny particle having little or no mass and no electric charge. The neutrino has never been seen, but its existence, nevertheless, is believed real. A neutrino might well penetrate the entire mass of the sun without reacting.

To analyze atomic hearts and learn about the strange particles that come zooming out of them, scientists use many tools to measure lifetimes, energies and masses.

One of the most promising recently developed devices is called a bubble chamber. Subatomic particles plunging through a superheated solution, kept under high pressure to delay its boiling, produce a train of bubbles. In this manner the bubble chamber is similar in operation to the cloud chamber, which physicists have been using for many years to track the otherwise invisible particles. A cloud chamber is filled with supersaturated water vapor in which the particles cause fog trails to form.

Great advantage of the bubble chamber is that about 20 times as many particles can be caught in it as in a conventional cloud chamber of the same size. Different liquids, such as liquid hydrogen, can also be used.

Another important, recent development is the polarized proton beam. In it, the protons have spins all in the same direction. The achievement is equivalent to the polarization of light, in which the light's vibrations are all in one direction, rather than randomly distributed.

• RADIO

Saturday, May 28, 1955, 5:00-5:15 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Gordon H. Strom, professor of aeronautical engineering, New York University, will discuss "Air Pollution."

Every atomic nucleus, as well as individual particles, spins on its axis. In an unpolarized proton beam, the axes point every which way. To polarize the beam, protons are hurled at a target of hydrogen, beryllium or carbon. By choosing only those protons that ricochet at a rather small angle, the particles with axes pointed in the same direction are selected.

The protons lose energy when they smash into the target, but if they have high enough energies, the bombardment and selection process can be repeated to get a purer polarized beam. So far scientists have managed to analyze the particles produced after a beam has gone through three targets, known to the scientists as triple scattering. They have also learned to tell whether the axis is pointed "up" or "down."

Although man is reaching higher and higher energies in atom smashers such as needed to polarize protons, even the most powerful machines are only now beginning to rival the low end of the cosmic rays that bombard the earth from outer space.

Photographs of nuclear collisions in cloud chambers located high in the mountains or installed in balloons and airplanes catch tracks of some of these. Emulsions such as used in ordinary photographic film are also a valuable tool for spying on cosmic rays and particles resulting from accelerator smash-ups.

Science News Letter, May 21, 1955

GENERAL SCIENCE

Science Prexies Over 50

➤ IF YOU have aspirations of becoming president of a professional society, you'll most likely have to wait until your fifties to be elected.

This is the conclusion of Dr. Harvey C. Lehman, professor of psychology at Ohio University, who has compiled the chronological ages at which individuals have first been elected presidents of 68 well-known national learned, scientific and technical societies.

Although professional prestige may be attained at any age level from the twenties to the late eighties, Dr. Lehman discovered, "the fifties are predominantly the years during which both men and women are most likely to become presidents of their professional organizations."

In his study, Dr. Lehman found that although the names of the former presidents of women's societies could be obtained, "the attempt to find their birth dates was not particularly successful." He reported that "a disconcerting number of women who have achieved contemporary eminence and whose names appear in biographical directories have failed to give their birth dates."

Dr. Lehman also found that:

1. There is no correlation between sizes of memberships and the average ages of the presidents.

2. Youthful presidents are elected more often by professional groups that include a large proportion of research workers rather than those whose members are chiefly practitioners.

3. There is a tendency for older professional societies to elect older presidents, and newly-founded groups, relatively youthful presidents.

4. That the average ages of society presidents are influenced by method of election, the society's membership policy and factors influencing the cost to the president in time and money.

The Ohio psychologist's findings led him to conclude that although presidents of such groups "are a very able and fine group of men, it nevertheless seems clear that sheer professional merit, in the narrow sense of the term, is not the sole factor that determines whether or not an individual is destined to become the president of his professional group." Dr. Lehman reported his study to *Scientific Monthly,* journal of the American Association for the Advancement of Science.

Science News Letter, May 21, 1955