is nine times as prolific as any previously known was devised by Drs. Edward S. Lamar and Overton Luhr, working in the new Eastman Research Laboratories. Protons are the positively charged kernels of hydrogen atoms and the most effective projectiles known to science for atom smashing.

Their new source is an electric arc operating in hydrogen at low pressure between an incandescent filament and a neighboring metal electrode. Ordinarily such an arc would produce ions of which about ten per cent. would be protons and the remainder molecular ions. However, by surrounding the arc with a third electrode maintained at a negative potential of a few hundred volts,

the percentage of protons produced is immediately increased to approximately 90 per cent. Dr. Lamar and Dr. Luhr are hopeful of still further raising the percentage.

The new proton source will be applied to the 10,000,000 volt Van de Graaff direct current generator recently tested at M. I. T.'s research station at Round Hill, Mass. Dr. Karl T. Compton, M. I. T.'s physicist-president, who collaborated in investigations out of which the Lamar-Luhr discovery arose, explained that protons speeded at 7,000,000 volts in the Van de Graaff generator are as effective as ordinary charged hydrogen molecules sped by twice that voltage, 14,000.000 volts.

Science News Letter, January 6, 1934

Odors Described By Numerical Tagging

"A ROSE by any other name would smell 6523."

This revised version of a famous saying occurred to many scientists at the meeting of the American Association for the Advancement of Science when they viewed a flavor and odor chart devised and exhibited by Ernest C. Cricker and Lloyd F. Henderson, associated with Arthur D. Little, the Cambridge, Mass., industrial chemist; for 6523 is the odor formula for the rose.

Other smells can be given numerical labels of this sort and these can be used to designate them just as numbers are convenient in tagging convicts and motor cars.

Each digit expresses one of four components in odor sensations, which in order of writing are fragrant, acid, burnt, and caprylic. The numbers indicate intensity on a scale of eight. The meaning of caprylic may be understood if it is known that the word is derived from "goat."

Mothballs, or naphthalene, in this code rate 4564, while the familiar gas of rotten eggs, hydrogen sulfide, is 5346. The sweetest smell reduced to this odor code so far is that of vanillin, 6021, and that may explain why so many of us like vanilla flavoring.

A rather terrible smell, strangely used as a basis for some of the most expensive perfumes, is skunk-like civet, 5777. But the scale failed when the chemists attempted to express the still more disagreeable smell of butyl mercaptan.

Science News Letter, January 6, 1934

Child Prodigies Lose In IQ As They Grow Older

DO EXCEPTIONALLY bright children keep their intellectual advantage over their fellows after they are grown?

The answer would seem to be in the negative, to judge from an investigation being conducted at the Graduate School of Education, Harvard University. A report of progress of this investigation was made to the American Association for the Advancement of Science by Prof. Edward A. Lincoln.

The intelligence quotients of superior pupils, as measured with the Stanford Binet test, drop substantially during a period of five or more years, and girls lose more than boys, Prof. Lincoln found. The pupils who were re-examined after a lapse of only two years did not show as great a loss; thus apparently it does not occur early in the school career.

Late Talking Explained

Intelligent children who do not learn to talk until they are 3 to 5 years old and then continue to use "baby-talk" are very likely suffering from a short memory span for sounds, members of the American Association learned from an address by Samuel D. Robbins, director, Boston Stammerers' Institute.

Memory span is measured by having the child repeat after you a group of numbers. The average child of three can usually repeat three digits correctly, but cannot repeat four correctly as often as once out of three trials.

Sixty per cent. of the children examined by Mr. Robbins because they were a year or more late in talking were found by him to have short auditory memory spans.

"Since language is learned by sound imitation, children who have a short memory span are at a great disadvantage in acquiring it," he said. "Although they may learn to understand many of the most common words they hear spoken in the home, they are often unable to reproduce words containing three or more different sounds until they are from three to six years of age, depending on how much their auditory memory span is retarded.

"As most words in common use contain three or more sound units, these children are unable to reproduce ordinary words. The task of repeating a word after another person seems so hopeless and impossible to them that they will not even attempt it."

"Children who are handicapped with short auditory memory should not be taught words containing more sound units than the length of their auditory spans," Mr. Robbins advised. "If it is necessary that a child learn a word or syllable containing more sound units than the length of his auditory memory span, this must be built up from shorter units within the child's span, as 'eat, t-r-eat, s-street, street-s.'"

Science News Letter, January 6, 1934

Formula Devised To Gage Gasoline Demand

A NEW mathematical f o r m u l a makes it possible to predict more exactly the effect of a change in prices or taxes on gasoline consumption. Announcement of the formula was made before the Econometric Society meeting in Philadelphia by Victor Perlo and Dr. C. F. Roos of the Division of Economic Research and Planning of the NRA.

In their statistical study, the two mathematicians studied the factors which affect gasoline consumption, not merely in the United States as a whole, but in local, state variations.

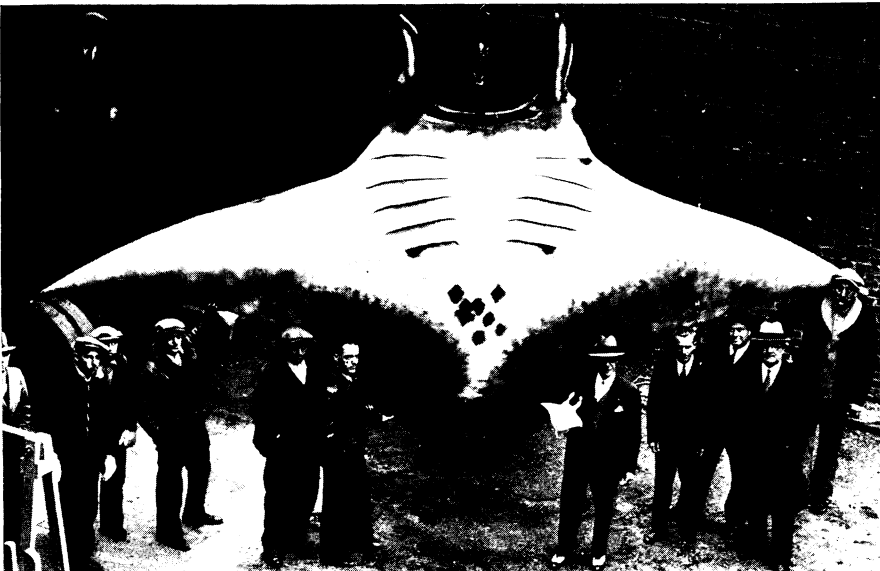A one cent increase in the price of

gasoline in Pennsylvania causes the motorist to use 12 gallons less gas in a year, they found. In Kansas a one cent increase causes a decrease of only three gallons. An added mile of good highway increases gas consumption twice as much in Virginia as in Mississippi.

Psychological factors play a part, they reported. In 1926, Virginia increased its gasoline tax by one and one half cents. The decrease in gas consumption which followed was twice as great as that following a one and a half cent increase in gasoline price. This same tendency was noted, to greater or less degree, in all the states studied.

Consumption of gasoline is influenced not only by prices and taxes, but by such factors as road building, fluctuations in purchasing power and registration fees. The net effect of influencing factors is expressed by the mathematicians in the formula which they call "the demand law for gasoline."

"This formula enables us to tell within two per cent. the annual consumption of gasoline per motor vehicle, if we know price, highway mileage, and the other factors involved," the report stated. "It can be used to determine the desirability of proposed changes in any of these factors, so far as they relate to gasoline consumption."

Science News Letter, January 6, 1934

Super-Hurricanes Found In Atmospheres of Distant Stars

Atmospheric Velocity of About 40 Miles per Second Revealed on Faint Star, But Sun's Wind Speed is Zero

GREAT WINDS blow in the atmospheres of the distant stars compared with which the hurricanes of the earth's atmosphere are mere zephyrs.

Dr. Otto Struve and Dr. C. T. Elvey, of Yerkes Observatory of the University of Chicago, announced to the American Association for the Advancement of Science that while the outer gaseous atmospheres which surround the luminous lower strata of the stars have heretofore been assumed to be relatively quiescent, they have discovered in the rainbow spectra of stars evidence that powerful turbulent currents exist in the atmospheres of many stars.

Spectroscopic phenomena that have puzzled astronomers for years are now explained, and Drs. Struve and Elvey even measure the most frequent wind velocity of individual stars. The faint star known as 17 Leporis has an atmospheric velocity of about forty miles per second. In epsilon aurigae it is twelve miles per second, and in the first magnitude bright star Alpha Persei it is about four miles per second.

In the sun, which is a star, there is practically zero wind velocity, however. The winds in the stars may be likened to the winds on earth although the densities of stellar atmospheres are much lower than the density of earthly air.

May "See" Invisible Stars

Astronomy seems to be on the verge of being able to "see" the invisible star light, both longer and shorter in wavelength than visible light from the stars, that can not now be satisfactorily studied by conventional telescopes and mirrors, Dr. Paul W. Merrill, of the Carnegie Institution's Mt. Wilson Observatory, told the astronomers.

Photoelectric cells, new photographic emulsions, and thermocouples, bolometers and radiometers, devices for measuring feeble temperature differences, are being improved to such an extent that astronomers should in the near future be able to extend their present fragmentary knowledge of the distribution of energy in the stellar spectra.

Science News Letter, January 6, 1934

Anesthetic Rivals Ether In Certain Operations

EXPERIENCE with a new anesthetic which is injected directly into the blood and which may prove as valuable as ether for certain types of surgical operations was reported by Dr. Gavin Miller of Montreal, to the Canadian Medical Association.

The new anesthetic is called evipan and was produced by a German pharmaceutical manufacturer. It has been tried extensively in Germany and England. Only one death was attributed to the anesthetic in over 20,000 cases in which it was used. Chemically, evipan is

New York World-Telegram

ACCIDENTAL DEATH FAR FROM HOME

This giant devilfish (*Manta birostris*) snagged itself in the anchor chain of a fishboat off Deal, N. J., during the past August. An unusual catch so far from warm waters, the giant manta proved interesting to Dr. Henry W. Fowler of the Philadelphia Academy of Natural Sciences, who examined it. He measured the fish's width as twenty feet four inches and estimated the weight to be between 3,000 and 4,000 pounds. The specimen is a female and, as it was hoisted in, gave up one young which is held by a man near the center of the photograph. This huge fish had apparently not been eating smaller fish, for its estimated 40-gallons of food examined by Dr. Fowler was made up entirely of minute plankton and necton without apparent trace of fish tissue or bones.