

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

ASTRONOMY

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 atmo-

spheric 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.

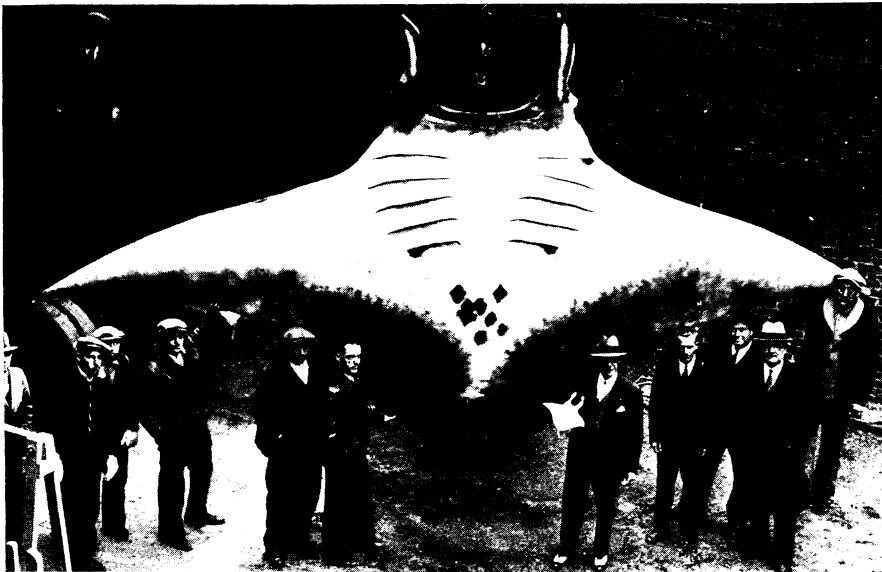
Science News Letter, January 6, 1934

MEDICINE

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 fish-boat 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.



BEFORE AND AFTER

Peter K. was suffering from suicidal phantasies; he drew pictures like the one at the top. After treatment and emotional improvement, his pictures were very different, like that at the bottom.

known as the sodium salt of N-Methyl-C.-C.-cyclohexenyl - methyl - barbituric acid.

The anesthetic, injected directly into the blood stream through a vein in the arm, produces a deep, normal sleep within thirty seconds. The operation can be started immediately. After the operation the patient awakens easily and gradually without any unpleasant after-effects. In Dr. Miller's experience, evipan is more effective if morphine or a similar drug is given first.

"If further investigation confirms my present experience," he concludes, "this drug may become as valuable to the surgeon as ether or novocaine for suitably chosen operations."

Science News Letter, January 6, 1934

Dr. Thorndike Honored

See Front Cover

Dr. Edward L. Thorndike, psychologist and educator of Teachers College, Columbia University, was elected president of the American Association for the Advancement of Science. Dr. Thorndike, whose picture is reproduced on the cover, has been associated with Teachers College since before the turn of the century and is known to all students of education for his theories of learning and habit formation.

Science News Letter, January 6, 1934

PSYCHIATRY

Emotional Difficulties of Children Revealed in Play

Puppets of Hated Elders Torn Apart to Relieve Strain; Drawings Reveal Thoughts That Fill the Young Mind

THE PLAY of children, if observed scientifically, gives an excellent clue to what is hidden in their minds, members of the American Psychoanalytic Association, meeting in Washington, learned from a report of Dr. Edward Liss, school psychiatrist of New York City.

Dolls and puppets used in dramatic plays and games in which the children act out a story, as well as story-telling and artistic composition in clay modeling, soap sculpture, and drawing, all reveal significant matters which the child is not able to put into words even if he were willing, Dr. Liss found in attempting the psychoanalysis of children.

One toy, used by Dr. Liss to bring out the suppressed hatred which children sometimes feel toward others, is a doll which can be taken apart merely by tugging at its many ball-and-socket joints. The child will pretend that the doll is the governess, or father, or whoever is resented, and then will yank off the arm or head with great energy. This serves to work off the child's emotional tension, as well as to reveal to the psychoanalyst the source of his trouble.

Peter K., a nine-year-old who was referred to Dr. Liss for examination because he was suffering from depression and suicidal phantasies, was allowed to make drawings without any direction. These drawings were full of action and showed the thoughts that were filling Pete's young mind. Scenes of physical violence and fires and other exciting catastrophes were the subjects he selected. Very different were the pictures drawn after he had been under treatment and had improved emotionally. These were the peaceful landscapes more commonly drawn by children.

Adults, too, betray their emotional condition through their creative efforts and creative play. Dr. Liss exhibited to the scientists two paintings made by a promising young artist. He came to Dr.

Liss for treatment, not because he was having difficulty with his art, but because he was a delinquent with kleptomanic tendencies.

The first picture, painted when his troubles were at their height, is very peculiar in style, eccentric in the use of color as well as in the composition. The second, done after he had gotten well, was in an entirely different style and shows that the boy has real talent when his emotional state does not interfere with its expression.

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ARCHAEOLOGY

Egypt Keeps Rank As Civilization Pioneer

EGYPT is still the land of "first things." Despite recent discoveries of antiquity in other lands, Egypt still holds her place as the country which led and pioneered in civilization, Dr. George S. Duncan of the American University told the Archaeological Institute of America meeting in Washington.

Egypt reached a higher quality of civilization for the same given periods, than did either India or Mesopotamia, Dr. Duncan pointed out.

The oldest artifacts in the world have been discovered in Egypt, he said, citing numerous instances of Egypt being "first." Stone tools found in the old Nile Bed, the oldest Egyptian hammers and first hatchets are pronounced several hundred thousand years old at least.

The first large organized government in the world's history, so far as is known today, was established in Egypt by 3400 B.C. with one ruler, the Pharaoh, at its head, Dr. Duncan continued. Other lands had city states with a king or local ruler over each. In Babylonia, the first union of states did not take place until 2000 B.C.

The earliest known physician, Imhotep, served an Egyptian pharaoh of the Old Kingdom, 2980-2475 B.C.