

spectral lines found in the light of the sun's corona.

None of the sought-for lines appeared, said the Princeton physicist, but—as so often happens in research—a new discovery was made. Prof. Shenstone passed an electric current through a chamber of helium gas and excited it until it gave off its characteristic pale blue-violet rays. Near the two electrodes of his discharge tube the usual and long-known line and band spectrums of helium were obtained.

However, his studies also disclosed the new continuous radiation almost on the surface of the positive electrode and also at a point about midway between the electrodes. By analyzing the radiation, Prof. Shenstone has shown that it extends continuously from the red colors into the ultraviolet region.

The new continuous spectrum has apparently no relation with the usual line, or band, spectrum of helium, says Prof. Shenstone. No accepted cause, which might explain its presence, has yet been worked out.

However, Prof. Shenstone suggests that the new radiation might be caused by the slowing down of the electrons, of the gas, as they approach the positive, or anode terminal. This is only a hypothesis, he added, however, which will require further study before acceptance.

Nitrogen Isotope "Plant"

A rare kind of sulfur, the isotope whose atoms are mass 34 instead of ordinary mass 32, has been concentrated by Dr. Harold C. Urey, Nobel chemist of Columbia University, in the latest of his separations of the different varieties of matter. H. G. Thode, John E. Gorman and Dr. Urey presented a joint paper announcing this latest achievement disentangling the isotopes.

Sulfur mass 34 has been concentrated threefold to 6.8 per cent. compared with 2.3 per cent. which is its frequency in natural sulfur.

In giant towers of glass at Columbia University, scientists are also tediously concentrating the rare isotope of nitrogen, having mass 15. Each day the large apparatus produces only a tiny drop of the rare nitrogen isotope, containing only 0.15 grams of material. Yet this rate is 100 times that of any other method.

Two columns of glass are used. One is 40 feet high and the other 25 feet high. A 46-fold increase in concentration of nitrogen 15 has been effected with the apparatus and a still greater

tenfold increase is expected as soon as a third tower 50 feet tall is added to the other two units.

Streamlined Golf Club

Something new for golfer, a streamlined golf club, was described at the meeting by Dr. S. J. Crooker, consulting physicist. Dr. Crooker exhibited a "tear drop-shaped" club which has only one-fifteenth the air resistance of a club head of the orthodox shape.

Streamlining is vital in a golf club, Dr. Crooker indicated, because at impact the club head meets the ball with speeds of something like 125 miles an hour. At these airplane speeds the application of aerodynamics to the shape of the club head has the same merits as it does to the shape of a modern transport airplane.

In windtunnel tests the superiority of the new club to the older kind was strikingly apparent. A long-hitting pro golfer, like Jimmy Thomson, should be able to strike a ball and have it carry 275 yards before hitting the ground, said Dr. Crooker. To which golfing "duffers" in the audience of physicists at the meeting added, "Woe is me!"

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said Prof. Harlow Shapley, director of Harvard College Observatory.

The two kinds of matter positively identified are galaxies and radiation, said Dr. Shapley. A third kind, star clusters, is indicated by preliminary observations still in progress.

"Of isolated stars, meteoroids and gas, we have no evidence," he declared, "and can make only rather insecure inferences."

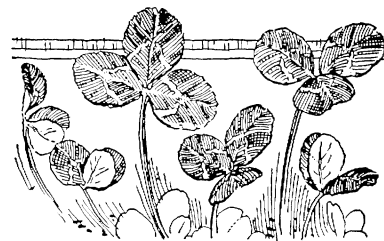
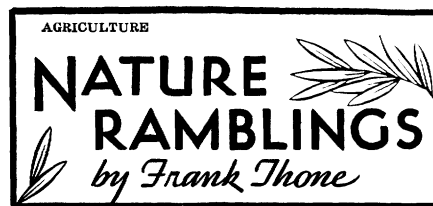
Metagalaxies are the most extreme galaxies known to astronomers. Metagalactic space is the most distant observable region of space which can be photographed on the largest astronomical telescopic camera.

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Piano wire is used in a soap factory to cut slabs of soap into small bars.

To relieve traffic congestion in Paris, a vehicular tunnel 2,700 feet long is being constructed.

Planting shrubs two or three feet away from a house allows space for painting or other work on the building when necessary.



New Kinds of Silage

GRASS, and legumes like alfalfa, soy beans, and cowpeas, go into silos on farms in the Northeastern states nowadays, where only chopped-up cornstalks went before. This one change in farm practice will be of incalculable help in the national campaign to check ruinous soil erosion.

For grass and the legumes are reckoned as soil-conserving crops, whereas corn, green goldmine though it is, must be counted as a soil-destroying crop because the clean cultivation it requires exposes loose soil to the action of running water.

Silos are indispensable in dairy farming, and highly desirable in the feeding of other kinds of livestock, because the slightly fermented, sauerkraut-like green fodder stored in them is not only highly nutritious but rich in vitamins. The fermentation keeps out undesirable kinds of microorganisms in much the same manner that sour-milk bacilli keep out putrefactive bacteria in the making of acidophilous milk and similar fermented health drinks.

Hitherto, corn and a few similar plants have been the only practicable materials for ensilage, because grasses and legumes do not contain enough

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sugar to promote this desirable fermentation.

This difficulty is overcome in the new grass-and-legume type of silage by adding cheap molasses while the silo is being filled. The molasses is not only ideal stuff for the fermentation bacteria to work on but it adds energy-food value and desirable mineral salts for the livestock. Incidentally, it also adds to the cash revenue of the cane-raising regions,

making them better markets for North-eastern products.

Grass silage and corn silage can be stored in the same silo, experience has shown. It will therefore be possible to withdraw erosion-threatened steep-sloping lands from corn, plant them in protective grass or legumes, and still make a combined profitable use of the whole product of the same fields.

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Sound is normally recorded by converting it into electrical energy which in turn controls an electric light focused on the film sound track. Mr. Williams' method changes the color of the light in accordance with the sound; the different colors are recorded with widely different sensitivity by the film in accordance with the change in color, thus producing an accurate record of the sound.

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PHOTOGRAPHY—ENGINEERING

Multiplane Camera Developed To Give Depth Illusion

A SPECIAL multiplane camera, making photographs of drawings at different distances from the camera, has been devised for use in the production of cartoon motion pictures that give the illusion of depth, it was reported to the Society of Motion Picture Engineers.

W. E. Garity of Walt Disney Productions described the camera, only one of many pieces of equipment that have been devised in recent years to enable the manufacture of realistic cartoon movies. Use of the new camera gives the motion pictures the vitality that comes with having depth in the drawings.

Cartoon pictures made under the old technique, in which the animated character moved across a background in the same plane, did not adequately give the illusion of real-life movement, Mr. Garity explained. Consequently, the camera which simultaneously photographs the drawing of the character and of a background drawing at a distance from the figure was developed. Its operation, he declared, is quite complex, requiring a detailed control sheet and a special periscope finder with which the operator can check before taking the picture.

"The results in giving increased pow-

er to animated motion pictures have been very satisfactory," he concluded.

Two new electrical devices that help to take the guesswork out of determining whether a given sound is the correct one were reported to the meeting.

One shows when a speaker's voice is too low or too strong or if it is just right. The other, which may be used in testing a singer's voice or in tuning a musical instrument, indicates whether the note being tested is just right or sharp or flat.

Described by S. K. Wolf, S. J. Begun and L. B. Holmes of Acoustic Consultants, Inc., both devices use cathode ray tubes as the indicators.

The sound level indicator consists of three portions, one fluorescing blue, the center portion green and the upper portion red. If the speaker's voice is too low the electric signal it controls will be too low and the blue portion of the tube will light up. If the voice is just right, the green portion glows, and if too strong, the red portion is illuminated.

The tuner links a cathode ray tube and twelve electrically-controlled tuning forks, one for each note in the scale. The device compares the note being tested with the standard notes, a wave pattern on the screen of the cathode ray tube moving to one side if the note is high or sharp, to the other side if it is flat.

Sound Recorded by Color

A unique sound recording system taking advantage of the fact that the sensitivity of certain types of film to light of different color or wavelength varies with the change in wavelength was described by A. L. Williams of the Brush Development Company of Cleveland.

CHEMISTRY

First Case of Color Change Heavy Hydrogen Reaction

THE FIRST recorded case where the substitution of heavy hydrogen, or deuterium, for ordinary hydrogen in a chemical reaction produced a color change, is reported (*Journal of Chemical Physics*, May) by Prof. Victor K. LaMer and Samuel H. Maron of Columbia University whose color-change experiments are still in progress.

It is well known that the substitution of a deuterium atom (D) for hydrogen atoms (H) in chemical compounds produces a material with different physical characteristics but, until the LaMer-Maron experiments, this change was never observable to the senses.

In the Columbia tests the change from hydrogen to deuterium atoms produced a light yellow color in a previously clear solution. The chemicals involved in the tests were a solution of proto-nitroethane in heavy water and a compound made of barium, oxygen and deuterium.

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by Dr. E. F. Northrup

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May 19, 3:00 p. m., E.S.T.

LOST ARTS OF THE STONE AGE—Dr. H. C. Shetrone, Director of the Ohio State Museum.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.