

opening of a huge plant by the Industrial Rayon Corporation at Painesville, Ohio.

Starting with cellulose sheets at the top, the process finally winds completely finished rayon threads, ready for delivery to textile mills, on bobbins set low on the floor. Differing from conventional procedure, the rayon is not spun and wound on the bobbins immediately after being formed, but is bleached, shrunk, prepared, dried and twisted before being wound.

Six years of research are represented in the plant, built at a cost of \$11,500,000. A pilot plant has been in operation successfully for two years. Fourteen acres of floor space have been provided in the buildings of the windowless, air-conditioned plant. Daylight enters the factory through glass wall panels and monitors of glass block, 371,000 of which have been used in the factory, the laboratory, the power house and auxiliary structures which together represent the largest glass block installation on record.

Special machinery for handling the rayon in this new fashion was developed by a subsidiary of the company. More exact conformation to specifications is one of the advantages claimed for the process.

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#### SOCIOLOGY

### How to Disarm Eventually Is Major World Problem

**L**OOKING beyond the present quickening of the pace of rearmament throughout the post-Munich world, there are those who are already asking what will be done with the energies and time of the millions of munition makers when and if the making of war instruments has reached saturation.

War itself may answer the question sooner or later by reducing war munition stocks and increasing the demand. But this would be a disastrous answer. The fact of the matter is that a rearming world is faced with a dilemma! War or the eventual return to an armed peace that allows an increase in consumers' goods which the economic system may have difficulty in assimilating.

For several years the nations of Europe have turned industrial plants into war materials factories. Now Great Britain and France are speeding this movement feverishly in the face of capitulation before Germany followed by greater threats from the Hitler regime.

Whether the peoples of the world can

stand the increasing financial burden and emotional strain is a query raised by a keen international observer, Dr. Stephen Duggan of the Institute of International Education. If this does not cause war, Dr. Duggan sees the return to peace through disarmament menaced by men left without work or governments that choose to go to war rather than face the domestic evils of disarmament.

The International Institute of Intellectual Cooperation, a League of Nations subsidiary, has been trying to foresee the consequences of a stoppage in the manufacture of instruments of war. But

such peaceful legal reasoning may not prevail in the face of revolution at home and fighting abroad.

Little possibility of disarmament is seen by Dr. Duggan until there prevails a greater belief in the justice of the present distribution of raw materials in the world. Of the 24 minerals and raw materials necessary to adequate modern life, 18 are in the control of the so-called Anglo-Saxon countries. Dr. Duggan believes that other nations will not continue to be content with such a condition.

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#### CHEMISTRY

## Catalytic Cracking Process Considered Very Important

### Makes Possible the Production of Gasoline Without Production of Oil and Other Derivatives of Crude Oil

**A**NNOUNCEMENT of a radically new refining process held to be of the greatest importance to the entire petroleum industry in that it makes possible independent production of gasoline, with or without simultaneous production of oil and other petroleum derivatives from crude oil, was made to the American Petroleum Institute.

Known as the Houdry catalytic processes for petroleum-hydrocarbon refining, the new group of methods was described in a paper presented by four oil technologists, including Eugene Houdry of the Houdry Process Corporation, whose name the process bears.

The process represents a distinct step forward, they said, for an industry faced with widely variant seasonal demands. Formerly whenever a certain amount of gasoline was made from a given crude oil, a certain amount of other products, for which no immediate market was to be had, was also produced. Now the petroleum refiner can produce only gasoline if that is his market at a given period of the year, they explained.

Associated with Mr. Houdry in the development work and in the presentation of the paper were Wilbur F. Burt, of the Socony-Vacuum Oil Company, A. E. Pew, Jr., of the Sun Oil Company and W. A. Peters, Jr., of E. B. Badger and Sons Company. Refining operations under the processes, now covered by 96 patents, were developed by Socony-Vacuum, the Sun Oil Company and the Houdry Process Corporation.

Economical meeting of the growing need for high octane fuels as well as ability to operate from a greater variety of crudes than has hitherto been possible are additional advantages claimed for the processes, now in use in three cracking units. Ten additional large units are in construction and will be completed in 1939.

The process is essentially a method for breaking down the large molecules of crude oil and trimming or building smaller molecules to the right size and type to make up the desired fuel. Catalytic agents are used to encourage necessary chemical reactions that either would not occur or would occur extremely slowly were they not present.

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#### CHEMISTRY—BOTANY

### Blue Roses Possible In Cornell Research

**S**TUDIES in the colloidal chemistry producing color changes in the flowers and leaves of plants, at Cornell University, are leading scientists to suspect that it may be possible some day to create a blue rose.

Intriguing is the study of the color changes in late autumn red leaves and the colors of red and blue flowers. These color pigments are known chemically as anthocyanin pigments. Over their origin chemists have had many a controversy.

In a report to the Journal of the

American Chemical Society, Prof. Wilder D. Bancroft and John E. Rutzler, Jr. of Cornell point out that the anthocyanins vary in color from red or purple through blue and green to yellow. The specific shade in any particular plant appears to depend on the acidity of the sap in the plant.

The development of anthocyanins appears to be due to plant enzymes. If you could inactivate the enzymes without killing the leaves it would be possible to prevent the development of red in leaves. Or, in contrast, if the Norway maple could get the proper enzyme its leaves would turn red in the fall.

Expose a red flower to ammonia vapor, state the scientists, and the blue in

the flower is apt not to be permanent in the absence of a stabilizer. If it changes fairly rapidly to yellow one gets no blue but only green. If it changes very rapidly to yellow one gets neither blue nor green. The leaves of a poinsettia are a case of this.

It seems probable, the scientists add, that all blue flowers contain a color-stabilizer. Sodium chloride, sodium nitrate and alum solutions are reported to stabilize the blue in particular cases.

No systematic study of other stabilizers for blue in flowers appears to have been made, but efforts seem worthwhile in this direction for out of it would come, conclude the scientists, "the production of blue roses."

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ducing secondary barytrons (heavy electrons) must be much more penetrating than photons. This high penetrating power suggests their identification with the neutrettos (neutral particles having mass and other properties similar to the barytron) postulated by Heitler."

## Ray Variations Explained

**W**ORLD-WIDE variations of cosmic ray intensity can be explained by the presence of a great ring of electricity whirling around the earth, far out in space.

This ring of electricity is the same mechanism which can account for the drop of cosmic ray intensity that occurs during severe magnetic storms, said Dr. S. E. Forbush, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, to the Society.

Electrical rings, Dr. Forbush added, were first postulated by the Norwegian scientist Dr. Carl Stormer to explain certain characteristics of the aurora.

The magnetic effect of the current in this ring of electricity, plus the magnetic effect of the earth's permanent magnetic field, would be expected to have a result equivalent to an increase in the earth's magnetic field. Such an increase in turn, would account for a decrease in cosmic ray intensity.

World-wide cosmic ray variation, Dr.

### PHYSICS

# High Altitude Research Finds Evidence For Neutretto

## This Newest Particle Has Mass and Other Properties Of Mesotron But Is Without Any Electrical Charge

**H**IGH altitude research at 14,200 feet has led to the identification of what physicists believe will be still another atomic particle known as the neutretto. The newest particle is without electrical charge and has the mass and other properties of the heavy electron.

The latter has been known by a variety of names, including barytron. Recently Nobelist Dr. Carl D. Anderson and Dr. Seth D. Neddermeyer of California Institute of Technology suggested still another name—the mesotron—for the heavy electron, in order to bring some order out of the chaos of nomenclature for this intermediate mass particle. (See *SNL*, Nov. 26)

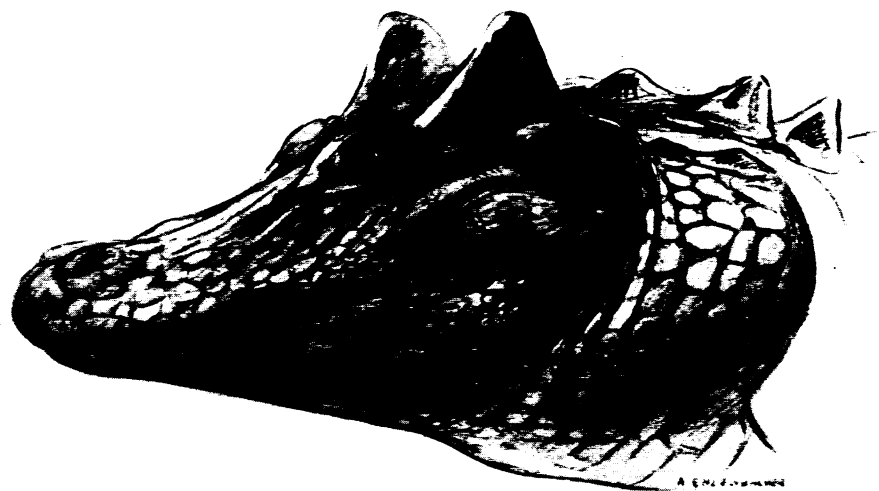
Mention of the discovery was made in the report of Francis R. Shonka of Chicago and De Paul Universities to the meeting of the American Physical Society. Mr. Shonka's report was introduced to the Society by Prof. Arthur H. Compton, University of Chicago Nobelist.

The new research, leading to the discovery of the particle, consisted of measuring cosmic ray intensity at high altitudes when various thicknesses of lead were placed in several selected positions about the four Geiger-Muller detecting tubes.

Great thicknesses of lead were required to bring out the maximum ob-

served effects. Says the Shonka report:

"In view of the great thickness of lead required to give the maximum effect, these non-ionizing particles pro-



### WITH A SMILE

*This extinct reptile, new to science, was probably not quite so friendly a creature as the artist here presents him in a drawing based on the fossil skull. The horned crocodile was discovered by the Field Museum Paleontological Expedition to Colorado, and is described in a new publication by Karl P. Schmidt, curator of reptiles and amphibians. The age of the reptile is given as paleocene, which makes it approximately 55 million years old.*