

## FORESTRY

## Hardwoods Will Yield Pulp With New Process Method

► PAPER PULP from southern New England and New York hardwoods is possible with a new process developed at the Polytechnic Institute of Technology, the Technical Association of Pulp and Paper Industries was told at a New York meeting by Dr. Robert S. Aries of the Institute staff.

The process consists of treating the oak, hickory and other hardwoods with soda ash and sulfur dioxide, followed by a method of mechanical grinding. Besides making hardwoods available for pulping, this method, since it involves only mild chemical treatment, results in a much higher yield of pulp than conventional methods of pulping. These conventional methods rid the woods of the greater part of the lignin. Normal pulp yields are about 50%; with the new process 75% becomes pulp.

The pulps obtained from hardwoods are particularly suited for making high quality rayons, cellophane and plastics products. There is an extensive oak-hickory area within a few hundred miles of New York.

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## PSYCHOLOGY

## Breakup of Marriage Less Prevalent Among Educated

► DOES education break up marriages?

In an effort to answer this question, Prof. William F. Ogburn, of the University of Chicago, studied Census statistics. Divorces, he found, increase with education up to the college grade where the tendency is reversed. The figures, expressed in percentage that the number of divorced men aged 30 to 34 is of married men living with their wives, are as follows: Fourth grade or less, 1.7. Seventh and eighth grades, 1.9. High School graduates, 2.1. College graduates, 1.3.

For women, the figures are more striking: 2.6, 2.7, 3.7, and 3.3.

But the picture is quite different, Prof. Ogburn found, if you count all men whose wives are not present and accounted for in the home.

"It may be," Prof. Ogburn suggests, "that the persons interviewed do not always report when they are divorced."

At any rate whether the couple are "separated" but not yet divorced, or whether the wife is working in another

place, traveling in a foreign land, in prison, in a hospital of some kind, or just missing, if she is not there the marriage may be considered as broken.

In this case, the higher the education the fewer are the homes with wives absent. The figures for men in the 30-34 age group are: 4.6 for fourth grade or less as against 3.2 for high school and 2.9 for college. For seventh and eighth grades the percentage is 3.8.

The corresponding figures for women show the same tendency for families with higher education to have fewer homes broken by separation: 6.1, 3.9, 3.1, and 3.1.

Even when the figures for divorces are combined with those for absent wives, the figures show the same downward trend with higher education—6.3, 5.7, 5.3, and 4.3. For men in the same age group (30-34), whose wives are absent or divorced, the percentage of those with less than a fifth-grade education is about half again as great as for those with a college education.

But Prof. Ogburn cautions against assuming that it is the education that holds husbands and wives together. It is known, he points out, that in general the better educated also have larger incomes. It could be that it is the higher income rather than the education that keeps the family together.

"The few indications I have been able to find in the Census data," he states, "suggest a closer relationship of family unity with high income than with high education."

Details of Prof. Ogburn's study will be reported in the *American Sociological Journal* in May.

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## VETERINARY MEDICINE

## Sulfa Drug Successful Against Poultry Disease

► A SULFA drug, sulfaquinoxaline, has been successfully used in the control of one of the most destructive of poultry diseases, coccidiosis, by a three-man research team at the Rhode Island State College, Kingston, R. I.

The drug, designated as "SQ" for convenience, was given to diseased birds in their feed. While untreated flocks suffered a 17% loss, the mortality among treated birds was cut to 2% or less.

The research team, consisting of Drs. L. C. Grumbles, J. P. Delaplane and T. C. Higgins, report their results in the journal, *Science*, (Feb. 20).

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# IN SCIENCE

## PHYSICS

## Scientist and Young Son Work on Watch Experiment

► A FAMOUS scientist and his 15-year-old son have made measurements which prove some old advice about handling your watch.

The advice is not to hang your watch up on a wall or bedpost. And this is especially important for the watch repairman who may hang your watch up when he is regulating it.

If a watch is hung up where it can swing freely, it may behave like a pendulum. And it can gain or lose as much as 10 to 15 minutes a day, new scientific experiments have shown.

The scientists who made the tests with watches are a unique father-son team. Dr. Edward U. Condon is director of the National Bureau of Standards and a famed atomic scientist. His eldest son, Paul, 15, is now in the ninth grade at Alice Deal junior high school in Washington, D. C.

About 10 years ago, Dr. Condon recalls, he read how the famous English scientist, Lord Kelvin, had discovered that his watch lost or gained because he hung it up on a bedpost at night. Dr. Condon thought it would make an interesting experiment to measure this pendulum effect. But he could not find the time to run the experiments.

Last summer, Paul, then 14, "wanted something to do," his father explains. So his dad gave him the problem of the swinging watches.

Paul worked without pay in the time section of the Bureau's metrology division during the vacation months measuring the oscillations of watches. The results were reported to scientists in a technical paper published in the *American Journal of Physics*. (Jan.).

The modest father denies that his son is anything more than a "regular boy." Currently, the young scientist is interested in photography, but his father is not ready to predict that the boy will grow up to be a scientist.

If you see watches swinging in a case on your watch repairman's wall, they may only be awaiting repair, Dr. Condon says. But if they are swinging when they are being regulated, the watches may lose or gain.

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# E FIELDS

## GENERAL SCIENCE

### Atomic Educational Group Needs Funds to Carry on

► IT COST \$2,000,000,000 to build the atomic bomb, but a group of politically-conscious scientists, including many who worked on the atomic project, are finding \$2,000 difficult to obtain.

The scientists, organized into the Federation of American Scientists, have been trying to make the American public "atom-conscious" and keep both scientists and laymen informed about such problems as atomic controls.

Now the Federation is threatened by a lack of funds.

"The instrument of the scientists for action in public affairs will be lost unless at least \$2,000 is obtained beyond the dues in the next two months," a statement explained.

"It is true the international scene looks dismal, but it would look far worse, if Congress and the people see that 'even the scientists have quit!'" the Federation appealed.

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## ARCHAEOLOGY

### Indian Occupation Sites Discovered in Dam Areas

► MORE than 20 extensive sites of former Indian occupation have been discovered already in a survey of areas to be flooded for dam projects on the Savannah River in Georgia and South Carolina, the Smithsonian Institution reported.

Two scientists of the Institution, Carl F. Miller and Joseph R. Caldwell, made the discoveries at the Clark Hill project, just north of Augusta, Ga. Work on the project is underway, but scientists hope that extensive excavations may be made before the area is flooded.

Archaeological exploration of the Clark Hill area is the first of a series of studies which will be made in prospective lake sites on the Savannah. Other projects include Anthony Shoals, Tallow Hill, Goat Island, Middleton Shoals, Hartwell, Old Pickens and Newry Dam.

The region is little-known before the time of the early colonists. At the be-

ginning of the Christian Era, wandering hunters are believed to have lived along the Savannah River. Agriculture and village life were probably not introduced until a few hundred years before Columbus, when Indians from the Mississippi Valley came to the area.

Details of the cultures of the Savannah are buried in the sites which scientists hope to uncover before the locations are buried under man-made lakes.

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## PHYSIOLOGY

### Freeze-to-Death Test Shows Pigeons Toughest

► RATS and mice freeze to death rather easily, but pigeons hold out much longer. These are among the results of a series of experiments with various warm-blooded animals, carried out in the Cold Room of the Harvard Fatigue Laboratory by a four-man team working for the Army Quartermaster Corps.

Mice, rats and rabbits, canaries, pigeons and chickens were placed in cages kept at a temperature of about 35 degrees below zero Fahrenheit, and the times it took for them to die were carefully recorded.

Mice succumbed most quickly, dying in less than 25 minutes. Canaries were next, surviving for only 36 minutes. White rats lasted from three-quarters of an hour to two hours. Some rabbits died in three and one-half hours, while others held out for as much as six and one-half hours.

Great spread in survival-time was shown by white Leghorn chickens. Some of them died in less than three and one-half hours, but "toughies" managed to stay alive for 29½ hours.

Most resistant of all the animals tested were Army carrier-pigeons. None died in less than 22 hours, and one lived for 78. This resistance in pigeons, incidentally, may offer a clue to the high survival of half-wild park pigeons under tough city conditions.

None of the animals hopped or fluttered around in an effort to keep warm.

The research team consisted of Dr. S. M. Horvath of the University of Pennsylvania, Dr. G. E. Folk of the Quartermaster Corps and Drs. F. N. Craig and W. Fleischmann of the Army Chemical Center. The work was done as a function of the Environmental Protection Section, Research and Development Branch, of the Quartermaster Corps., and was reported in *Science* (Feb. 13).

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## ELECTRONICS

### New Rectifier Tube Contains Cesium Vapor

► A NEW highly-efficient rectifier tube to change alternating electric current to direct current contains the vapor of cesium metal and has its cathode surface of cesium coated on nickel, General Electric reveals.

It has long life, and gives better than 98% efficiency, compared with 94% in some of the rectifiers now in common use, according to Dr. Albert W. Hull, under whom it was developed in collaboration with E. E. Burger and R. E. Turrentine of GE research laboratory.

The emission of electrons from the cesium, coated on the nickel surface, even at relatively low temperature, is one of the most copious known, Dr. Hull states. There is no appreciable evaporation of the nickel, and the coating of cesium is continually renewed from the vapor in the tube.

Cesium is a silver-white metallic element belonging to the potassium family. It gives up one electron more readily than any other element, hence its use as the light-sensitive film in photo-electric cells.

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## ASTRONOMY

### Paths of Major Planets To Be Calculated Exactly

► THE paths followed by Mars, Venus and the other nine major planets will soon be exactly calculated. The most modern electronic calculators yet developed will be used for this huge, long-range research project, states Dr. Dirk Brouwer, director of the Yale University Observatory.

So extensive are the calculations involved that the United States Naval Observatory, the Watson Scientific Computing Laboratory in New York and Yale University have entered into a cooperative enterprise with the support of the Office of Naval Research.

The study of the motions of the major planets, begun at Yale last year, will be speeded up through use of the latest in calculators, the Selective Sequence Electronic Calculator announced only a few weeks ago. Theories of astronomy which have been in existence for the past 50 years have been augmented by an accumulation of accurate observations. A new investigation should considerably improve our knowledge, Dr. Brouwer reports.

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