

## PUBLIC HEALTH

**Women Will Outnumber Men Five to Two**

WOMEN WILL OUTNUMBER men five to two when normal life expectancy hits 100 years, two doctors have predicted.

Females can withstand more abuse than males. Perhaps it is because the cellular constitution of the female has a greater built-in reserve capacity, Drs. Edward L. Bortz of Philadelphia's Lankenau Hospital and Walter M. Bortz, II, of Charity Hospital in New Orleans, suggest in *GP*, the journal of the American Academy of General Practice.

Commenting further on the processes of aging, and the growing numbers of senior citizens, the doctors pointed out that our society often measures the performance of older individuals on the basis of the abilities of younger persons. The assets which the older man has that the younger man lacks are often overlooked.

With the coming of the machine age, many of the physical abilities of the young become less important while the experience and knowledge gained through time by older citizens may become of greater value, the doctors point out.

The lengthening of life in modern times does not seem to postpone the age of best creative effort or lengthen that period, either. Instead, the creative period has tended to come earlier. On the other hand, great leadership comes in later years. Military leadership most often appears in the forties, while political and business leadership make their bid in the fifties and sixties.

The custom of compulsory retirement, particularly at an age when many individuals have attained their top performance capacity, must give way to more realistic programs.

A suggested solution offered by the doctors includes a second career program for individuals over 60 plus a plea to doctors to utilize their skills and experiences to construct a smooth transition program for such individuals and the community.

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## VIROLOGY

**Polio Virus Resembles Raspberry in Structure**

THE BASIC structure of the polio virus has been determined.

The spherical virus is a cluster of 60 identical units of protein, arranged somewhat like the seeds of a raspberry, around a central core, Dr. A. Klug and J. T. Finch of London University report.

The polio virus is the first animal virus to be identified in detail. The anatomy of only two other spherical viruses, both affecting plants, has been studied in comparable detail.

The scientists were able to identify the raspberry structure by means of X-ray photographs. Within the structure lies a core, composed of nucleic acid. This is the portion of the virus which transmits infection. The 60 protein units act as a protective

shield for the acid, the scientists explained.

The shape of this shield is identical to that of an icosahedron, a solid having 20 plane faces. The two plant viruses already identified have this shape also. Dr. Klug believes that possibly all spherical viruses share the same geometrical make-up.

The vital key to identification was supplied when, in 1956, Drs. F. H. C. Crick and J. D. Watson of the Cavendish Laboratory in Cambridge, England, suggested how geometrical concepts could be applied to problems of virus structure.

Dr. Klug suggests the spherical arrangement may be the most economical pattern for packing the small protein particles around the core.

When a virus invades a normal living cell, the nucleic acid begins to dominate the cell's processes. From this switch in command come more virus particles until the normal life of the cell may break down completely. The repercussion of these events then leads to a specific disease.

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## PHYSICS

**Hair May Put Finger On the Right Criminal**

BEFORE THE RUSSIAN criminal leaves the scene he had better check to see no hairs are left behind.

A few hairs from his head could help police "put the finger" on him.

New and more reliable methods of investigation of hair properties have been developed in identifying criminals, a Russian researcher reports. Pointing out that identifying hair by its looks is not satisfactory, A. N. Kishinevskiy of the Second Moscow Medical Institute describes other more exact methods.

Light refraction, hair sturdiness and elasticity are used as criteria in establishing hair similarity, the Russian says in a report translated by the Central Intelligence Agency in Washington.

A difference of 0.0045 in the value of light refraction between hairs, for example, means the hairs could not belong to the same person—thus ruling out one suspect. A difference of 40 grams in the stress needed to break two hairs would mean they came from different persons.

The methods are not yet being used, Prof. Kishinevskiy says.

In this country we are also working out ways to use hair for identification. One of the best and most promising, P. R. Bidez of the Federal Bureau of Investigation told SCIENCE SERVICE, is the use of hypersonic oscillation.

More work is needed before the method can be used in the field, but basically it works. The high speed oscillations, from 400,000 cycles per second to 1,000,000 cycles per second, shake the hairs. This puts the group specific substances in hair, which are similar to those in blood, into solution. Chemical tests can then be made and the specific substances identified, Mr. Bidez said, so that hair can actually be placed in a group as is blood.

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**IN SCIENCE**

## ELECTRONICS

**"SWAMI" Detects Motion at 1,000 Feet**

A RADAR-LIKE DEVICE the size of an ordinary radio tube can detect and measure movements up to thousands of feet away.

The device, called "SWAMI," can be adapted to plug into an ordinary household electrical socket, inventor Louis B. Mulvey, West Newton, Mass., told SCIENCE SERVICE. In fact, the device uses only the amount of electricity that an ordinary night light consumes, he said.

SWAMI, an acronym for the standing wave area motion indicator, can detect the opening of a window or door in a security check situation. Any motion detected by the device appears on a monitoring board as a red light which alerts a guard to check the area under surveillance.

It can spot a truck up to three-quarters of a mile away.

At the present time, one military service is testing SWAMI at several installations.

Future applications of the device include nuclear test ranges, to assure that the blast area is clear; protection of bank vaults; police detection of speeding on highways, and prison security. The device, manufactured by the Singer Military Products Division of New York, is light enough to be installed in helmets of military personnel.

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## BIOCHEMISTRY

**Foresee Pest Control From Growth Regulators**

PLANTS THAT OOZE their own pest control chemicals may soon be helping the farmer in his fight against insects and nematodes.

U. S. Department of Agriculture researchers are optimistic about the built-in pest control compounds based on what they have learned so far with three plant-growth regulating compounds.

The recently tested substances, meta-chloro, meta-fluoro and para-fluoro, are related to MOPA (alpha methoxyphenylacetic acid), a promising systemic compound that can be moved throughout the plant and exuded from plant roots in its original chemical form. Another form of MOPA called mandelic acid has no growth-regulating effects but can move through the plant.

If a chemical that will protect plants against diseases, insects or nematodes could be mobile within plants, as the growth-regulators are, scientists would have an important new weapon for pest control.

Basic research is now being conducted by scientists in the Growth Regulator and Antibiotic Laboratory at the Plant Industry Station in Beltsville, Md.

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# E FIELDS

## HORTICULTURE

### South African Flower Ready for U. S. Gardens

SOUTH AFRICA is offering a bright bloom for American gardens, the sunflower-like gazania.

As border plants, few summer flowers are more showy than these gaudy new hybrids, U. S. Department of Agriculture horticulturists said. Recently developed in England, the hybrid gazania blooms vary from white through pure yellow to orange and deep pink. The flowers have dark green to almost black eye-spots at the base; however, some solid colors without eye-spots do occur.

The new gazanias flower all summer until frost and will grow best in sandy, well-drained soil. The plants, which usually form densely tufted clumps, are four to six inches tall.

Some plants are grown commercially now, but new supplies of cuttings and seeds arriving in the U. S. will make this flower widely available to interested gardeners within the next two years, Dr. F. G. Meyer, USDA botanist, said.

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## ASTRONOMY

### Space Traveler to Jupiter Would Hit Radiation

A SPACE traveler landing on Jupiter would face at least 100 times the radiation he encountered on leaving the earth and passing through earth's two known natural radiation belts.

This conclusion is based on observations of radio waves emitted by Jupiter, largest planet of the sun's system. Its diameter is some 87,000 miles and its mass two and a half times that of all other planets combined. Temperature at its surface is thought to be about 200 degrees below zero Fahrenheit from actual measurements of its radiation to earth.

Temperatures of the outer layers of Jupiter's atmosphere can also be found from measurements of its radiations at radio wavelengths.

Dr. F. D. Drake of the National Radio Astronomy Observatory, Green Bank, W. Va., using the 85-foot radio telescope, has found that Jupiter's temperature is 5,400 degrees Fahrenheit at a wavelength of about nine inches.

From this and other measurements at various frequencies, he suggests that Jupiter's radiation from far above the planet's surface is emitted in much the same way that atomic particles are speeded up in certain atom smashers. This is known as synchrotron radiation.

On the assumption that synchrotron radiation originating in natural radiation belts

surrounding Jupiter is responsible for the radio wave observations, the giant planet's magnetic field would have to be about ten times stronger than the earth's field. The natural radiation belts would have to contain about a million times as many charged particles as earth's Van Allen belts.

Both these assumptions appear physically reasonable, it is reported in *Sky and Telescope* (July).

The numbers and amounts of particles in the earth's Van Allen belts change with time and with the sun's activity. Observations of Jupiter are being continued to determine if corresponding changes there reveal themselves by variations in the radio emission.

Science News Letter, July 18, 1959

## MEDICINE

### Computer Could Aid Doctor in Diagnosing

A COMPUTER that could aid the doctor in diagnosing a disease has been suggested by two scientists.

To use the computer the physician's task may become more complicated, but certain benefits would result from the use of a machine of this type, Dr. Robert S. Ledley, professor in electrical engineering at George Washington University, told *SCIENCE SERVICE*.

The machine would store codes for symptoms, diseases and their relationships. Then, in those cases which are particularly hard to diagnose, such as those already in the hospital, the machine would sort out all possible afflictions for the doctor's consideration.

Many doctors now believe that most of the errors in diagnosing result from omission rather than any other source. That is, the doctor sometimes simply overlooks a possibility. This machine could assure the doctor that every possibility will be dug out of the "metal brains" of the computer. The machine would eliminate all the diseases that are unrelated to the unknown disease.

The computer can also perform certain routine thought processes in medical diagnosis, leaving the doctor free to concentrate on the important intangible decisions concerning the patient's condition which the computer cannot do.

Medical diagnosis consists of three ingredients: medical knowledge, signs and symptoms from the patient himself, and logical reasoning, Dr. Ledley and coworker Dr. Lee B. Lusted, radiologist at the University of Rochester, report in *Science* (July 3).

The machine may indicate, at any stage of diagnosis, which laboratory tests should be taken. This could increase the efficiency of laboratory test selection.

But the headache for the doctor, if he uses this machine, will come when he realizes that he must brush up on his understanding of mathematics and logic. Probability, value decisions and logic would play important roles in this doctor-computer team.

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## PSYCHIATRY

### Parents of Schizophrenic Get "Emotional Divorce"

THE PARENTS of a mental patient with the common illness schizophrenia are typically so distant toward each other that they have what amounts to an "emotional divorce."

The mother and the patient form an "intense twosome" with the father permitting himself to be pushed aside so that he becomes practically nothing more than an observer in his own family.

These facts, which may have an important bearing on the course of the patient's illness, were revealed when the National Institute of Mental Health in Bethesda, Md., took in four families of mental patients for treatment and intensive study.

In each of the four families, father, mother and patient all lived together in a psychiatric ward and all received treatment for a period up to two and a half years.

Another six families (also father, mother and patient) received treatment as outpatients.

Fathers and mothers were equally immature, it was found. Because they were so strikingly distant toward each other, the patient had had to act as unsuccessful emotional mediator between them.

The study was conducted by Drs. Murray Bowen and Robert H. Dysinger and Miss Betty Basamania, all of the National Institute of Mental Health.

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## PUBLIC HEALTH

### Polio Is Crippling Twice As Many Now as in 1958

POLIO IS CRIPPLING twice as many people this year as it did last year at this time.

United States Public Health officials are disturbed. This two to one ratio may continue for the entire polio season and the season is in its early stages. Furthermore, the ratio may increase.

Normally, the number of polio cases hits a peak sometime in August or September, Dr. C. C. Dauer, medical adviser at the PHS, told *SCIENCE SERVICE*.

There will undoubtedly be an increase in the number of cases reported as the season progresses. But officials are keeping their fingers crossed that the increase does not surpass the number of reported cases for the peak-season of 1958.

Surgeon General LeRoy Burney has repeatedly warned that the polio season is here. More than 40,000,000 persons in the United States still have not received their Salk shots.

The PHS has suggested that those who have received three shots could gain added protection from a fourth. Pregnant women, the most susceptible, and persons who expect to travel in areas where polio is expected, plus those who have not had a Salk shot for several years, were urged to do so.

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