

EDUCATION

Revolution in Teacher Education Under Way

► A REVOLUTION is under way in the education of American teachers, stressing academic subjects instead of how-to-teach courses.

A leader in the battle for better education, the Ford Foundation issued a report of the revolution aimed at the 100,000 young people who annually enter the teaching profession to help educate America's 40 million elementary and secondary school students.

Experimental programs at leading universities and teacher colleges, with the assistance of the Foundation and the Federal Government, are aimed at raising the quality of preparation of future teachers. Subjects in science, mathematics and English are stressed over the standard "teacher education" courses taught in many colleges. The effort is known as the teacher-education "breakthrough" program.

Since World War II, the concern for good teachers has been overshadowed by the desire for more teachers in this nation, the Foundation claims. At the start of the 1961-62 school year, the United States was short an estimated 138,000 schoolteachers. Thus a premium has been placed on quantity, not quality.

There was, for a long time, stiff competition among graduate and professional schools for the best students, and schools of education did not compete. Meredith Price, assistant to the dean of the Harvard Graduate School of Education, explains in the report: "Now we are convinced that we have one of the best programs and one of the best careers that anyone can offer."

One of the innovations of the revolution, the report points out, is the internship program at several of the universities. Similar to the internship plan of medical students, students in education serve a year of internship after receiving their bachelor's degree and teach for experience.

In a departure from the traditional arrangement with the student practice teacher serving as an unpaid novice, the intern is a paid member of the teaching staff, starting at the beginning of the term and staying until the end. The school treats him as a mature college graduate and the students accept him as a "full-fledged" teacher.

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PHYSIOLOGY

Rhythm Method Change Seen in New Concept

► THE "RHYTHM METHOD" of birth control will have to be changed if a new concept of ovulation (release of egg cell from the ovary) is correct.

Instead of the generally accepted idea that ovulation occurs 14 days before the next menstrual period begins, the new concept places the time as the eighth or tenth day.

Using a liquid electrode system connected to a highly sensitive recorder, Dr. Langdon Parsons of the Boston University School of

Medicine noted that the process of ovulation is dependent on the length of the menstrual cycle, which is normally 28 days.

"If the cycle is delayed, ovulation may occur later than the mid-cycle point," Dr. Parsons explained, adding that ovulation is a natural process with individualistic variations.

The recording device transcribes vaginal electro-potential measurements in the form of a graph called the E.V.G. or electro-vaginogram. The E.V.G. is similar to the familiar electrocardiogram, which records heart activity. Daily serial recordings show electro-potential changes to form a characteristic cycle pattern. Analyses of 24-hour urine specimens show a complete disappearance of one of the metabolites of the ovarian hormones called pregnenediol at the same time that ovulation is recorded on the E.V.G.

"It is present before, absent at and reappears following ovulation," Dr. Parsons said.

The most exciting, but controversial, aspect of the E.V.G., Dr. Parsons believes, is its hope for childless couples. Forty percent, or 67 patients in a group of 164 who had tried to become pregnant for five years or more, became pregnant. Of those who did not succeed, 31 had pelvic pathology and 18 more had husbands with inadequate sperm count.

The E.V.G., since it measures ovarian hormonal activities, may also have important application to the study of patients with cancer of the breast and other malignancies known to be related to body hormones.

Dr. Parsons reported his study at a two-day symposium on "Human Ovulation" sponsored by the Lowell M. Palmer Foundation in cooperation with the Boston University Medical Center at the American Academy of Arts and Sciences in Brookline, Mass.

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MILITARY SCIENCE

Mobile Weapons Control System Tested

► A NEW \$3 million control system is being tested by the U. S. Air Force for use in jungle warfare.

Known as the 412L, the system is housed in two collapsible domes, and includes a three-dimensional radar, capable of feeding an aircraft's altitude, speed and direction directly to a built-in computer.

It is highly mobile, and can be disassembled and transported anywhere in the world by tractor or by the C-130 cargo aircraft of the Tactical Air Command.

The system's computer can provide ready data on the number and location of friendly air bases, the state of available intercepting aircraft, where to intercept the enemy, and most favorable choice of weapons. The system can also direct both manned and unmanned aircraft toward their targets.

Built by General Electric, the system can also be used as a permanent installation, protected from nuclear attack by concrete walls or an underground location.

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IN SCIENCE

SPACE

Mariner II in Space Verifies Predictions

► THE FIRST scientific results of Mariner II probe to Venus have verified previous predictions of outer space made by men on earth.

Estimates of the density of cosmic radiation and the strength of magnetic fields to be encountered in an interplanetary space probe are very near the actual data readings from Mariner II, now more than 4 million miles from earth. Thus far the radiation to which Mariner II has been exposed has not affected its electronic equipment.

On Dec. 14 at about 7:40 a.m. Greenwich mean time (2:40 a.m. EST), Mariner II, on command from earth, will begin transmitting data about the atmosphere of Venus. At that time both Venus and the space craft will be about 36 million miles from earth. If the instruments on board Mariner II continue to function as scheduled, scientists may get their first real evidence of whether the atmosphere of Venus may permit some form of life.

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ARCHAEOLOGY

Ancient City Had Civil Defense System

► THE ANCIENT Gibeonites, who lived nearly 3,000 years ago in the village now known as el-Jib in Jordan, had a civil defense system that worked well for them.

Although Gibeon was threatened constantly with aggression, it was seldom attacked. Gibeon is one of the most famous cities in the Bible, located a few miles north of what is now Jerusalem.

University of Pennsylvania archaeologists headed by Dr. James Pritchard, a curator in the University Museum, unearthed the latest evidence for Gibeon's civil defense system.

The elaborate defense included two walls encircling the city and a camouflaged tunnel leading from inside the inner wall to a nearby spring. This insured an adequate water supply during a long siege.

The outer wall was built during the early part of the first Iron Age (1200-900 B.C.) and was standing when the Gibeonites made their peace with Joshua. The inner wall, which is much larger, is believed to date from shortly after the conquest of Gibeon by the Egyptian king Sheshonk, called Shishak in the Bible. He ruled Egypt from 945 to 924 B.C.

Also unearthed during the past summer's diggings was a cemetery dating back to 20 centuries before Christ. It contained 36 rock-cut tombs illustrating burial customs during this middle Bronze Age time and documenting details of the daily life of the Gibeonites.

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E FIELDS

MEDICINE

"Blue Baby" Riddle Appears Near Solution

► THE MEDICAL MYSTERY of "blue baby" gasping spells affecting the lives of thousands born with serious heart abnormalities appears near solution. About one baby in every 2,000 born is a "blue baby."

When a blue spell sets in, the blue baby becomes more and more blue as he breathes harder and harder, but the cause is a riddle. About one in every three or four blue babies has these gasping attacks.

Dr. Warren G. Guntheroth, associate professor of pediatrics at the University of Washington, Seattle, working under American Heart Association grants, has now made a preliminary report on investigation of blood flow in a blue baby. His theory is that the harder the breathing the faster the blood flow.

By using a new device called a thermistor, he found a definite pumping effect of respiration on blood flowing in the large veins into the heart. Dr. Guntheroth is awaiting an opportunity to measure the blood flow in a blue baby while a blue spell is in progress and to study the effect of treatment. Surgery is usually needed.

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MEDICINE

Blood Clotting Hastened By Negative Ion

► WHEN A MAN cuts himself shaving and reaches for paper tissues to stop the blood flow, it is the "negative ionic charge" that hastens the desired blood clotting.

But it is believed that the membranous lining of the circulatory system—heart, arteries, veins, capillaries, and including the lungs—must normally carry a positive ionic charge, be neutral or uncharged, or certainly have no more than a feeble negative charge, to keep the blood flowing and prevent the internal clotting that can kill.

Dr. Donald Hubbard, a chemist at the National Bureau of Standards, who has been doing research for a number of years on blood coagulation in relation to ionic charges of certain materials, told SCIENCE SERVICE that the success of implants or replacements of parts of the circulatory system depend upon the ionic nature of the material.

Dr. Hubbard has tested plastic substitutes for heart valves and artificial arteries and veins to discover the ionic nature of their surfaces and their safety for implant. He found that woven nylon and Teflon make effective artificial blood vessels because of their small negative ionic charge. This insures defense against internal bleeding.

Clotting can be brought about inside the living vein, he said, by the introduction of a thread carrying a negative ionic charge. The use of silk, nylon, catgut, flax, cotton

or glass as sutures would restrict bleeding in the region tied off.

Glass surfaces play some mysterious role in starting or hastening blood coagulations, Dr. Hubbard reported after studies made at the Bureau of Standards with Dr. George L. Lucas, now at the University of Wisconsin, Madison.

In order to store fresh blood in glass containers anticoagulants must be added to prevent the accelerating effect on the normal coagulation rate. Glass rods also affect the clotting rate. This is due to the negative ionic charge that appears on glass surfaces.

Cellulose gauze fibers and cotton make blood clot quickly because of the negative ionic charges. Effective "country remedies" such as spider webs and chewing tobacco also have these charges.

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SEISMOLOGY

Iranian Shock "Small"; Bigger Quake to Come

► DESPITE the worldwide rash of large earthquakes in Iran, Italy, Colombia and the United States, scientists are expecting a still larger one.

Tens of thousands of persons lost their lives in the Middle East, South America and Europe since July from widespread tremors. But a tremendous earthquake of magnitude eight, still expected, could cause much more havoc than that created in the Iranian quake Sept. 1. Whether or not more lives and property are lost depends upon the location, still unknown, of the shock.

Since the middle of June there have been 16 earthquakes which could have caused the damage felt in Iran, scientists said in Washington, D. C. But only five have taken lives due to nearness to population centers.

The last eight-magnitude earthquake and associated tidal wave claimed 2,000 lives in the relatively unpopulated area of Chile on May 22, 1960. One is expected every 18 months.

Large earthquakes have been reported from Japan, Russia, Turkey, Chile, Colombia, and Alaska over the past few weeks, U.S. Coast and Geodetic Survey seismologists said. In Italy, however, the frequency of quakes, both large and small, has been much larger than normal.

Normally, summer months are the most active earthquake months. The peak is reached in August. The amount of shocks reported is not above that expected, seismologists said. They will average out to the predicted number for the year, with about 40 being of the largest magnitude.

Although scientists do not know where or when the "big one" will occur, they are hoping that it will be in some remote mid-oceanic area.

The United States has been unusually fortunate with earthquakes this year, the scientists pointed out. Although the Utah quake in August was of magnitude six, damage was slight. California and Colorado have also recorded earthquakes this summer but no real losses were reported.

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PUBLIC HEALTH

White House Conference Spotlights Drug Abuse

► MILLIONS of barbiturate and pep pill takers, along with nearly 47,000 active narcotic addicts, have become the national problem considered by the first White House Conference on Narcotic and Drug Abuse in Washington, D. C.

Virtually all the drugs now abused are extremely valuable in normal medical practice. A progress report commissioned by President Kennedy pointed out that their abuse "represents a prostitution of their legitimate function."

Psychologic dependence on drugs that are not legally restricted can produce "addicts" who behave compulsively. Although physicians cannot supervise self-administered drugs, they are responsible for educating individual patients in the dangers of large doses and prolonged use of medication that they themselves may have initially advised.

Psychiatrists have warned family physicians to look into their patients' backgrounds so they will understand the reasons for continued anxiety that demands a "chemical crutch." Drugs may be the wrong prescription.

When the habitual use of barbiturates is stopped, the withdrawal symptoms may lead to grave consequences, even suicide.

There is some concern about drugs used to treat mental depression. Although medication is an aid to treatment for underlying causes of the depression in seriously depressed patients, possible emergence of suicidal tendencies must be anticipated.

The White House Conference report says that drug abuse itself is not a disease, but rather a "manifestation of underlying psychologic or physiologic disorders about which we have little knowledge."

Approximately 400 authorities on legal, medical, sociological, pharmaceutical and other fields explored drug abuses.

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MEDICINE

Solid Food for Young Infants Causes Allergy

► THE APPARENTLY widespread practice of feeding infants solid foods as early as two weeks of age may lead to food allergy and bowel problems, according to Dr. Robert A. Tidwell, an assistant clinical professor of pediatrics at the University of Washington Medical School, Seattle.

Dr. Tidwell asserted in Milwaukee that such early feeding of solid foods "makes no sense." He said that an infant's digestive tract has not matured enough to break down solid foods.

Breast feeding is ideal, Dr. Tidwell said, but when this is not possible, proprietary formulas containing milk should be fed for several months before solid food is used.

The pediatrician also said that because of better water purification, sterilization of feeding bottles is no longer necessary in most cities, and the bottles need only be washed in dishwasher.

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