CYBERNETICS

Automation Affects More Shop Than Office Jobs

➤ AUTOMATION does not replace as many jobs in the front office as in the shop, a study has indicated.

Installation of computer data processing systems in a cross section of 11 firms cut clerical jobs by only 1% to 10%, in contrast to factory labor reductions that ran as high as 50% to 60%.

The effect of automation on clerical positions was studied by Dr. Roger C. Vergin, assistant professor of business administration, University of California, Berkeley, and Andrew J. Grimes, research fellow at the University of Minnesota.

The 11 firms, all located in the Minneapolis-St. Paul area, included large and small companies in such varying fields as banking, insurance, wholesaling, public utility, investment and transportation.

Because of the high turnover in clerical positions, there were virtually no layoffs in any of the firms converting to computer processing, the researchers found.

Most firms began the adjustments in anticipation of the reductions by use of overtime and temporary help, they said. These policies permitted some reduction in regular employment by natural attrition prior to the installation of the computer.

The greatest effect on clerical help was felt by employables rather than employees, it was found. Prior to installation of a computer, one large financial firm annually hired 100 inexperienced women clerks. After installation, only 10 women were hired annually in spite of a large increase in volume of transactions.

The study, reported in a recent California Management Review, showed that most users underestimated the cost of programming the computers.

• Science News Letter, 86:168 Sept. 12, 1964

MICROBIOLOGY

Polarized Light Used To Study Cell Structure

➤ AN OLD TOOL, polarized light, has been used in a new way to probe the secrets of the cell.

Dr. Herbert A. Kordan, assistant research plant physiologist at the University of California, Los Angeles, has used polarized light to study the microscopic cellular structure known as the nucleolus.

The nucleolus, a little-understood segment of the cell nucleus, is thought to be an important link in the process by which the genetic code is transformed into the living characteristics of a specific organism. It therefore may have a key role in normal cell growth and development as well as in abnormal cell activity such as occurs in tumors.

Dr. Kordan's work is supported by the American Cancer Society.

Previously, the structure of this tiny cell body was studied under the light and electron microscopes with different staining techniques and with radioisotopes.

Dr. Kordan has employed a rather widely used laboratory technique of studying complex molecular structure by shining polarized light through an object. The way the speed of light is altered as it passes through the object reveals details about complex molecular structure not always obtainable by other means.

He said this tool can be used in microscopic studies of the nucleolus within living as well as in fixed, stained and unstained specimens.

Dr. Kordan plans to use polarized light to observe this vital cell body during different periods of cellular development, in hopes of learning more of its role in normal and abnormal cellular growth.

• Science News Letter, 86:168 Sept. 12, 1964

TECHNOLOGY

Bundled Pipeline Takes Oil Ashore

➤ A "BUNDLED" PIPELINE, a system of four lines tied together, is being used to transport oil ashore from a well two miles at sea and 260 feet below the ocean surface.

Three service lines and one anchor line are strapped together to provide a fast, cost-reducing means of installing and protecting the pipe, which has a 20-year life span. These "bundled" lines were developed by Alcoa Aluminum and Richfield Oil Company engineers.

• Science News Letter, 86:168 Sept. 12, 1964

MEDICINE

Experiment on Selves, Doctor Urges Colleagues

➤ PHYSICIANS are morally obligated to submit themselves to the same experiments they carry out on others, claims Dr. Otto E. Guttentag of the University of California Medical Center in San Francisco.

In Science, 145:768, 1964, he said physicians who experiment on others, but not on themselves, are building a human "hierarchy," putting themselves at the top.

Such physicians are assuming a difference between the value of their existence and that of other humans, he said. Medical history is filled with names of men who used themselves as guinea pigs.

Recent examples, he pointed out, include Dr. Albert B. Sabin, who was the first to swallow his oral vaccine, and Dr. Jonas Salk, who injected himself, his wife and his three sons with his vaccine.

Some persons may call such acts "false heroism" and "stupidity," Dr. Guttentag said, but actually these are signs of a deep understanding of the nature of medical research.

Dr. Guttentag noted that in medicine the experimenter and subject are on the same level—both are human. Scientists in other fields, who deal with nonhuman subjects, are not faced with this moral complexity in their work.

To see the physician-patient relationship as a general-soldier relationship is contrary to Western culture and the Hippocratic oath, Dr. Guttentag contends.

• Science News Letter, 86:168 Sept. 12, 1964

IN SCIEN

BIOCHEMISTRY

Fruit Makes Even Lemons Taste Sweet

➤ EATING A LEMON is not a sour experience if an African berry that has a certain magic of turning sour foods sweet is eaten first.

The berry, called miracle fruit, not only makes such foods sweet, but gives them a flavor never before possible with natural or synthetic sweeteners. It may even offer a new approach to dieting, because it does not add caloric value to foods as sugar does.

Salty and bitter tastes are unaffected by the miracle fruit, Dr. George E. Inglett told the 148th national meeting of the American Chemical Society in Chicago.

Miracle fruit, which grows mainly from Ghana to the Congo, is used by the natives to make sour beer and bread more pleasing to their taste. The berries are football shaped, three-quarters of an inch long and grown on large shrubs 6 to 15 feet high.

Dr. Inglett found that the sweetening effect is temporary. Repeated tasting of lemon slices, however, returned the sweetness. This effect was observed for almost two hours with diminishing sweetness intensity.

Dr. Inglett said the berries have large seeds with small amounts of pulp holding the material responsible for sweetness. Freeze-dried samples of this pulp remain potent for at least three months if stored at freezing temperatures, he said.

Dr. Inglett and the coauthors of the report, Basil B. Dowling, Dr. J. J. Albrecht and Dr. F. A. Hoglan, are all of International Minerals Chemical Corporation, Skokie, Ill.

• Science News Letter, 86:168 Sept. 12, 1964

BIOCHEMISTRY

Subfreezing Cold Snap Slows Photosynthesis

➤ AN OVERNIGHT subfreezing "cold snap" will slow photosynthesis in evergreen trees for days afterward, even if warm weather returns.

A subfreezing cold spell damages the "machinery" used in the photosynthesis process, and as a result, conversion drops to 50 or 60% of the pre-freezing level, over a period of about five days. The lower the temperature of the spell, the more photosynthesis is impaired and the longer it takes to recover.

If the "cold snap" is severe enough—below 23 degrees Fahrenheit—a very long time is required for recovery.

These facts were reported by Drs. Richard P. Pharis and Henry Hellmers of the California Institute of Technology, Pasadena, at the Joint Meeting of Biological Societies in Boulder, Colo.

• Science News Letter, 86:168 Sept. 12, 1964

CE FIELDS

SPACE

Titan 3 Has Future As Jack-of-All-Trades

➤ THE U.S. AIR FORCE'S giant Titan 3A rocket, which just missed its first goal of carrying 3,750 pounds of lead into orbit around the earth, will be used in the future to carry everything from small rescue ships to entire space stations.

Although the maiden flight failed to achieve its orbit, possibly due to premature shutting down of the third stage, there are still big plans for the Titan 3. A network of communications satellites is planned for 1966, with all eight satellites launched from the same Titan rocket.

For about a month during 1968, two astronauts will live in a manned orbiting laboratory (MOL) while medical researchers study the effects of prolonged weightlessness. In addition to the MOL, the Titan 3 launch vehicle will carry a modified Gemini capsule, called Gemini B, for use as a recovery vehicle.

There are two versions of the Titan 3. The lead-carrying model is the Titan 3A, which could boost four times as much lead as there is in the current shot into an orbit 1,000 nautical miles above the earth.

Larger payloads to come will ride aboard a modified 3A called the Titan 3C. The difference is two five-segment, solid-propellant motors, which will increase the thrust of the Titan 3A by 400%.

• Science News Letter, 86:169 Sept. 12, 1964

PUBLIC HEALTH

Early Cancer Detection For Women in England

➤ A CAMPAIGN to provide a screening service for the early detection of latent cancer in women's wombs has been launched by the Family Planning Association in London.

The association expects to have its nationwide service in full operation within two years. Already 138 of its 409 clinics offer screening tests.

The FPA test can show whether a woman will develop cancer of the cervix, the neck of the uterus, within the next 10 to 15 years. Preventive action could be taken at once, stopping as many as 2,500 deaths a year from cancer of the womb.

Women's groups, including the Royal College of Nursing, plan to ask the Ministry of Health to urge the 15 regional hospital boards that control England's National Health Service hospitals to make the test available to all women.

There are 17 million women between 20 and 65 in England and Wales. More than 335,000 of them regularly attend the Family Planning Association's clinics.

The service is handicapped by a lack of pathologists and technicians with special training in cytology. Hence, the British Medical Association is advising screening for women over 35 at five-year intervals. Women's organizations, however, want the service available at once for women aged 25 or more.

The Family Planning Association wants family doctors to carry out routine screening of their patients, with hospital pathological laboratories interpreting the results. Later, the association hopes local health authorities will open special clinics for the service.

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TECHNOLOGY

New Package Ends Need For 'Fragile' Stamp

➤ SPECIAL PACKAGES that will be used to ship delicate aerospace equipment could have saved all the fuss about transporting Michaelangelo's magnificent sculpture "Pieta" to the New York World's Fair.

A special double container system involves an inner and outer box, with springs, dampers and shock absorbers in between.

The containers must be able to protect high-precision instruments even if they are accidentally dropped three feet from a truck bed to a concrete floor, said Maurice Gertel, director of the Shock and Vibration Division of Mitron Research and Development Corporation, Waltham, Mass.

The containers, which have many applications, were first developed for transporting optical guidance equipment to the National Aeronautics and Space Administration's Manned Space Flight Center, Houston, Texas. The project took almost three months of testing and experimentation, Mr. Gertel told SCIENCE SERVICE.

In addition to better shock protection, another advantage to the box-within-a-box is space saving. Instead of three or more feet of padding, only about 15 inches are required for the suspension system.

Furthermore, Mr. Gertel said, when the package reaches its destination, the outer layer may be removed, reducing bulk still more. Possibilities of damage in the plant are much less than in transit.

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TECHNOLOGY

Spacecraft's Windows Tested by Giant Siren

➤ THE WORLD'S largest siren was recently given a strange task—trying to break the windows of the Gemini spacecraft.

The test was designed to simulate the tremendous vibration caused by the atmosphere during early parts of the Gemini's flight.

The Martin Company tested the windows, made by Corning Glassworks, Corning, N. Y., by pointing the siren at the three-layer panes from different angles. The siren produced sounds over a wide range of frequencies at once.

The windows are shaped like pointed ovals, almost like a human eye. They withstood sound as loud as 160 decibels for repeated five-minute periods.

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PHYSICS

Element 104 Synthesis Reported by Russians

➤ SOVIET SCIENTISTS have synthesized element 104, the Russian news agency Tass reports.

Prof. Dmitri Blokhintsev, director of the Joint Nuclear Research Institute in Dubna, announced the discovery by a team headed by Gerogi Flerov.

The element, not designated by name, is reported to have been synthetically created by bombarding plutonium (element 94) with "accelerated ions of neon-22 (element 10)."

Like other man-made elements, element 104 is unstable, having a half-life of about three-tenths of a second, Tass said.

Element 104 is the 12th transuranium radioactive element discovered since 1940. It should be similar to halfnium, element 72, according to atomic table predictions, and should begin a new series of elements.

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PSYCHOLOGY

Dropouts, Delinquents Alike, More Impulsive

➤ BOY DELINQUENTS and school dropouts are more impulsive than boys who attend school and do not get into trouble, an investigation indicates.

The study, which covered a five-year span, also indicated that there is no significant difference between the values apparently held by dropouts, delinquents and other boys. Differences between the dropouts and delinquents in both impulsiveness and self-reported values were generally minor.

Drs. Francis J. Kelly and Donald J. Veldman, both of the University of Texas, Austin, reported the investigation in the Journal of Abnormal and Social Psychology, 69:190, 1964.

• Science News Letter, 86:169 Sept. 12, 1964

SPACE

Lunar Vehicle to Ride First on Giant Scaffold

➤ A GIANT STEEL GANTRY, or scaffold, one and a half times as long as a football field and 250 feet high, will take the Lunar Landing Research Vehicle (LLRV) for its first ride.

The gantry will simulate the moon's low gravity by supporting five-sixths of the weight of the LLRV, suspending it from a carriage that can move freely around the scaffolding. The remaining sixth will be supported by the LLRV's hydrogen peroxide engines.

Many pivots on the carriage will give the vehicle the same freedom of movement that it would have in space. The pilot will be able to control his attitude by auxiliary jets in addition to the main propulsion.

The gantry was designed by Jackson and Moreland, Boston, and is being installed at the National Aeronautics and Space Administration's Langley Research Center, Hampton, Va.

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