

GENETICS

Chicken-Quail Cross Is Scientific "Success"

► A CROSS between a chicken and a Japanese quail, weighing one-thirtieth as much as the chicken, has resulted in living chicks.

However, this bird will not be sold for public consumption, for it took 2,200 eggs to produce ten chicks that eventually died. Six of them died a few days after hatching, three lived up to six months and one survived about a year, Dr. Frank H. Wilcox of the University of Maryland poultry division, College Park, Md., told SCIENCE SERVICE.

Nevertheless, the cross is scientifically significant because of the great difference in size between the two birds. The roosters artificially fathering the hybrids weighed an average of seven to eight pounds. The quail weighed about one-quarter of a pound.

The Japanese quail were artificially inseminated from three chicken breeds, white leghorn, a flightless strain and dark cornish. The size of the offspring was closer to the quail than to the chicken.

The eggs from which the hybrids hatched were the size of a walnut, or about one-sixth the size of a chicken egg, Dr. Wilcox said. All the offspring were male and would not have been able to reproduce themselves.

Dr. Wilcox said the experiment will not be repeated since no additional scientific information could be expected to result from it. The chicken and the quail belong to the same subfamily (Phasianidae) but to different genera. Hybrids have earlier been hatched from a rare cross of the chicken and the turkey, birds belonging to different families, resulting in the so-called "churk." (See SNL, 78:291, Nov. 5, 1960.)

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MEDICINE

Army Saved \$5,000,000 By Vaccine for Recruits

► THE UNITED STATES ARMY recruit training program was saved \$5,000,000 during a six-month period through use of a vaccine that reduces upper respiratory illness.

Routine immunization of recruits by types four and seven of adenovirus (glandular virus) vaccine reduced hospitalization, estimated to cost \$25 a day for each recruit, during last year's season of cold weather. Also included in the saving was the cost of training a recruit, estimated at about \$22 a day.

Further search for a more potent adenovirus vaccine is under way, four U.S. Army physicians report in the Journal of the American Medical Association 178:1125, 1961. They are Drs. Robert W. Sherwood, Edward L. Buescher, Robert E. Nitz and Joseph W. Cooch.

Physicians also read in their official journal that "once a Caesarean, always a Caesarean," although challenged by many, is probably a valid point.

In a review of 215 consecutive cases of repeat elective Caesarean operations, Dr.

George W. Morley of the University of Michigan Medical Center, Ann Arbor, recommends that the Caesarean section be chosen for such patients rather than normal birth (p. 1128).

Another report concerns a rare case of abdominal tumor that caused spells of unconsciousness resembling a stroke. Dr. J. C. Thomas Rogers and John H. Houseworth of the Carle Clinic and Carle Memorial Hospital, Urbana, Ill., state that low blood sugar was also a symptom. Only 25 such cases have been reported in medical literature. The tumor was successfully removed in the present case (p. 1132).

Two cases of acute leukemia, or bone cancer, associated with pregnancy are reported by Dr. Herlan O. Loyd of Sacramento, Calif., formerly clinical associate professor of medicine at the University of Missouri, Columbia. Normal infants were delivered after the mothers were treated with corticosteroids and an antimetabolite, 6-mercaptopurine (p. 1140).

One of the mothers died shortly after delivery of her baby, but the other was still being maintained on prednisolone for a longer survival period than has been reported previously.

• Science News Letter, 81:8 January 6, 1962

SURGERY

English Boy Survives Gunshot Wounds of Heart

► A 12-YEAR-OLD English boy wounded in the chest by a shotgun is believed to be the only survivor of a heart operation for removal of gunshot pellets.

A total of 11 free pellets were removed from the cavities of the heart and one from behind it, London surgeons report in the British Medical Journal, Dec. 23, 1961.

For years scientists have agreed that foreign bodies in the heart should be removed because even if they did not cause immediate death they could cause thrombosis and embolism that would lead to death. But recent developments such as the heart machine have now made a successful operation such as the English boy survived possible.

One of the strange features of this story was the way in which the pellets remained in a single mass while traveling 105 feet from the gun to the boy. They adhered to each other slightly on removal and had not ricocheted or struck any bone. Also the pellets were large enough to be stopped and firmly impacted instead of progressing further into cranial vessels.

Thirty pellets in all entered the chest in a loosely adherent mass, the surgeons state. The pellets crossed the right lung and pericardium (sac that encloses the heart), and then entered the right atrium (upper chamber of the heart). Many pellets became clotted in the pulmonary circulation.

The boy was sent home after about six weeks of hospitalization. Drs. J. B. Kinmonth, J. D. Burton, D. B. Longmore and W. A. Cook report the case from the Department of Surgery, St. Thomas's Hospital Medical School, London.

• Science News Letter, 81:8 January 6, 1962

IN SCIEN

PSYCHIATRY

Addiction an Illness, Not a Sin or Crime

► WHAT MAKES a drug addict the way he is reflects illness rather than a sin or crime.

Prolonged psychiatric treatment may be necessary to relieve the underlying emotional problems of the addict, Dr. Percy Mason of the University Hospital, New York University-Bellevue Medical Center, New York, told the sixth Hahnemann symposium on psychosomatic medicine in Philadelphia.

Cures are so difficult that even partial alleviation of this chronic disease is a legitimate goal of the practitioner.

The general addict population may be divided into two main groups, the psychiatrist believes. Sociological addicts are those who live in the slum areas of large cities where unemployment, delinquency, broken homes and poor education are common.

Middle class, "psychological" addicts who have higher social, economic and educational background, resort to drugs to solve their own individual problems. They can be more readily helped, it is believed, than the sociological addicts.

Withdrawing the patient from drugs is comparatively easy in a drug-free environment with the use of appropriate medication, Dr. Mason said, but whenever the going becomes difficult, the tendency is toward relapse.

This chronic disease is characterized by physiological and psychological dependency upon drugs as well as the development of tolerance to them, he pointed out.

• Science News Letter, 81:8 January 6, 1962

AGRONOMY

Fertilizer Pills Now Available for Plants

► PLANTS LIKE humans may soon combat their nutritional deficiencies by taking "pills." Promising results from experiments with fertilizer in capsules by soil scientists I. W. Ahmed, W. C. Dahnke, O. J. Attoe and L. E. Englebert at the University of Wisconsin, Madison, were reported at the meeting of the American Society of Agronomy in St. Louis.

The capsule is designed to slow down the release of the fertilizer to spread its use over a longer period. Small perforated polyethylene bags are filled with fertilizer. Rain water percolating through the soil enters the bags, dissolving the fertilizer. As the pressure within the bag increases, the water seeps out carrying some of the fertilizer in solution. Still in the experimental stage, the capsules are not yet available to the public.

• Science News Letter, 81:8 January 6, 1962

CE FIELDS

MEDICINE

Medical Journal Uses Interlingua Summaries

► THE NEW YORK State Journal of Medicine, beginning Jan. 1, will appear as a completely redesigned publication with summaries of its articles in the international language, Interlingua.

These summaries are easily readable by anyone in all parts of the world because they are in a language that can be thought of basically as a common language of those who know European languages, such as English, French, German, Spanish and Russian.

The New York medical journal thus joins the Journal of the American Medical Association and about 25 other medical journals, in the United States and abroad, that use this international language.

The Interlingua summaries are carefully worked-out abstracts giving the essential gist of the article proper. Title, author, and journal issue are fully identified at the head of every summary, which can thus be clipped and filed for ready reference. All the Interlingua summaries are gathered together on one page with advertising matter overleaf.

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MEDICINE

Patients Recuperate On Cushion of Air

► PATIENTS with back injuries can now be kept from aggravating their injuries by riding a cushion of air above their beds.

Using a cushion of air in the same way a hovercraft is supported above the ground, Dr. John T. Scales of the Institute of Orthopedics at London University has successfully completed experiments using animals as patients.

Dr. Scales kept a pig in a state of suspension for long periods. Using the hovercraft principle, combined with other curtains of air at the perimeter of the bed to prevent the central cushion of air from leaking out, 12 jets forced nearly 2,000 cubic feet of air a minute to keep the pig "patient" suspended above the bed.

The pig had a wound in its back, which was treated under anesthetic. After an hour's suspension the wound was completely dry. No after-effects of infection occurred when the pig was lowered gently onto the bed by a steady reduction in the power of the jets.

"The pig's temperature fell during the time it was supported by the air jets, a factor which contributed to the post-operative well-being of the animal," Dr. Scales reported.

At least 18 organizations, including the

Royal Army Medical Corps and hovercraft experts from the British Government's National Research Development Corporation, have helped Dr. Scales carry out his early experiments.

"It occurred to me that supporting a patient on air might solve some of the problems of nursing patients whose illness necessitates the avoidance of contact with their beds—for example, patients with severe burns. Lying in bed makes it difficult to dry the damaged area and nursing is complicated."

Other advantages which Dr. Scales foresees with this new method of treatment are reduction of shock, no tissue loss to a wound, and rapid creation of a dry antibacterial shield.

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BIOCHEMISTRY

Genetic Message System Now Partially Decoded

► THE MYSTERY of the genetic code—a system of messages between two chemicals basic to the origin and continuity of life—has been partially unraveled.

Drs. Marshall W. Nirenberg and J. Heinrich Matthaei of the National Institute of Arthritis and Metabolic Diseases (NIAMD), Bethesda, Md., have prepared a biochemical system patterned after the genetic code. The system can be directed to manufacture specific proteins, life's most complex and important molecules.

The code involves the hereditary materials, DNA (deoxyribonucleic acid) and RNA (ribonucleic acid), which occur in all living cells. DNA, the hereditary material of which genes are made, is composed of sugars and phosphoric acid groups to which are attached four chemical bases.

DNA's ability to transmit genetic information from one generation to the next comes from its four bases, which make up a template, or mold. This template of hereditary specifications is transferred by RNA, the messenger that in turn directs the manufacture of protein needed for life.

RNA's job as a biochemical middleman is dependent on its own bases—adenine, guanine, cytosine and uracil. The sequence of these four bases determines how some 20 different amino acids will be linked to form specific protein molecules.

The code by which varying positions of four bases direct the selection of 20 amino acids for protein synthesis is similar to the way dots and dashes in Morse code spell out meaningful words from the 26 letters of the alphabet.

The scientists first prepared a model experimental system from the bacterial *Escherichia coli*, which is normally found in the intestines. By feeding the system with particular known samples of synthetic RNA, they noticed that the system was "directed" to produce protein material using only one of the 20 amino acids. When the structure, or code, of the RNA samples was known, it was possible to relate the code to the specific amino acid used.

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GENERAL SCIENCE

Athletic Science Study Needed for U.S. Winners

► THE UNITED STATES must study athletics more scientifically and revise its present concept of amateurism if it is to develop international winners in sports.

This is the belief of Dr. Laurence E. Morehouse, director of the UCLA Human Performance Laboratory who recently returned from a year's study and inspection of Europe's sports medicine laboratories and clinics, including those of the Soviet Union, Poland, Czechoslovakia, and Yugoslavia. He also visited Egypt and Syria.

He warns that the United States is increasingly being faced with more efficient systems for the development of top athletes and athletic teams.

He cites, for example, that it is common for many European governments to employ full time trainers (coaches) for each of the major sports. The trainer is charged with seeking out the best players and then offering them the opportunity to live and train at a national sports center preparatory to international competition. Austria, he adds, makes use of its colorful old castles for this purpose.

Poland's intense interest in developing top athletes is revealed by the title of one Warsaw establishment visited by Dr. Morehouse: The Institute for Training of Sportsmen for International Competition.

Not only do athletes live and train here, he said, but research is carried out in the fields of sports medicine (the biological and medical aspects of the training and protection of athletes) and human performance.

"Behind the intense interest shown by European nations in athletics," the UCLA physical education professor says, "is the belief that the talent produced in art, science and sports is a fair criterion of each nation's worth. Consequently the development of athletes is not left to chance."

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CHEMISTRY

Synthetic Graphite Made For Space Lubrication

► CRYSTALS of graphite are being synthesized by scientists of the Midwest Research Institute, Kansas City, Mo., in an attempt to explore the possibilities of using dry lubricants made from this elemental material in outer-space vehicles.

That dry lubricants are superior to liquids in space travel has been recognized. The mechanism of lubrication by means of graphite was not known so the U.S. Air Force contracted for the research.

Finding the natural single crystals of graphite not perfect enough to represent the fundamental graphite lattice, the Kansas City scientists developed two methods of making suitable crystals synthetically.

Both thermal decomposition of aluminum carbide and vapor deposition of carbon were utilized for this purpose.

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