

have been found as far as Dr. Matthews knows; and any changes in the proper motion—not detectable since 1950.

Dr. Matthews has submitted details of his findings, with pictures and diagrams to the *ASTROPHYSICAL JOURNAL* (Letters).

EVOLUTION

Latent Diseases Rise Up

How old is malaria? For that matter, who cares? The important thing is to wipe it out now.

But, in fact, the age of the malaria organism matters very much in the eradication battle. So do the ages of the smallpox virus and most of the other viruses, protozoa and bacteria that infect human beings.

The importance of an evolutionary approach to infectious diseases is spelled out in a new book compiled and edited by Dr. Aidan Cockburn and published last week ("Infectious Diseases: Their Evolution and Eradication," Charles C. Thomas, Springfield, Ill., 420 pp., \$18.50).

Dr. Cockburn, now medical director of Detroit's war on poverty program, spent nearly eight years in the tropics, working at various times for the Agency for International Development and the World Health Organization.

From knowledge of a wide range of infectious diseases, Dr. Cockburn traces their origins and explains how living habits act upon man's infectious inheritance to draw out one disease or another.

Early man was probably infected with a good many disease organisms—some of which came from primate ancestors, some of which evolved with man himself, says Dr. Cockburn. Not all the infections became diseases for early man, since his living habits would suppress some and encourage others. Through centuries of cultural change, such as the agricultural and industrial revolutions, this same interplay would bring out diseases dormant in man since his earliest days.

Syphilis is a prime example. It first appeared in Europe in 1493 and soon after became a crucial fact in European life. (Henry VIII had syphilis, says Dr. Cockburn; he suspects that the king's resulting inability to produce an heir led him to divorce his first wife and establish the Anglican church.)

For 500 years, authorities have debated whether Columbus' crew infected Europe on their return from the New World in 1493. Dr. Cockburn believes cultural changes stemming from the Protestant Reformation gave rise to the disease.

The syphilis organism, *Treponema*, was probably present in earliest man, he says. It has recently been found in

baboons, and the appearance of human-like infections in lower primates gives reason to believe the organism has been passed down from generation to generation through centuries of evolution.

Syphilis doesn't easily coexist with yaws, a non-venereal form of *Treponema*. Yaws is mainly a disease of children and is passed through body contact in societies where people wear few clothes. Once a child has yaws, he is immune to syphilis.

Before the Protestant Reformation, with its stress on sexual morality, Europeans were not ashamed to sleep naked eight to a bed or clean themselves at community baths. But after the Reformation, people began wearing nightclothes and sleeping one or two to a bed, says Dr. Cockburn. The baths closed down. Yaws declined and syphilis appeared.

Scarlet fever organisms, streptococci, also appear in lower primates and were probably present in early man, says Dr. Cockburn. Yet scarlet fever didn't ravage Europe until the 19th century. Crowded slum conditions growing out of the industrial revolution suddenly changed scarlet fever from a minor disease into a virulent scourge, he believes.

Origins of the polio virus are so far unknown, but Dr. Cockburn suggests that improved hygiene let the disease loose.

During its first six months of life, an infant is protected by maternal antibodies against any disease the mother has had, he says. Under poor sanitary conditions, the infant contacts many infections and becomes immune to diseases like polio. Once hygiene improves, the child no longer runs through a series of infections in its early months and

becomes susceptible to polio later on.

Both polio and infectious hepatitis are seldom found among citizens of underdeveloped countries, says Dr. Cockburn. As a result, they see little reason to invest in eradication programs against either disease. Perhaps their reluctance may disappear with improved sanitation, he suggests.

Dr. Cockburn also believes cancer is caused by a virus that evolved with man, but didn't become prominent until a change in society—in this case living to old age.

Monkeys, apes and man share not only the syphilis and scarlet fever organisms but those causing encephalitis and yellow fever as well. Of 14 dysentery-causing protozoa in man, 13 also exist in monkeys and apes. For many of man's viruses, there are equivalent forms in lower primates. This is the case with the malaria parasite.

Even if malaria is successfully eradicated from humans in areas like Africa and Asia, man can still contact the disease from monkeys. And there is no way of getting rid of monkey malaria, says Dr. Cockburn.

Smallpox seems to offer the best chance for eradication. Once it is wiped off the face of the earth, it probably will not appear again since its closest relative infects animals like horses, cows and chickens. Man may have contacted the disease from his domestic animals when he first settled down to farm, but by now evolution may have created a gap too large for the virus to bridge.

But new diseases are bound to appear, Dr. Cockburn believes. "Every time there is a change in society, new diseases pop up"—many of them based on infections as old as man or older.

GENERIC DRUGS

Amendment Fails; the Idea Lives On

The Social Security bill emerged from the House-Senate conference last week without its generic drug amendment.

The amendment, sponsored by Senator Russell B. Long (D-Ark.) had won approval by the Senate in a 43 to 37 vote (SN: 12/9) but made little headway in conference. Designed to cut the Government's \$300 million a year drug bill by one-third, the Long amendment demanded that federally purchased prescriptions be written for inexpensive generics rather than higher priced brand-name drugs.

While the Conference committee was meeting, the Pharmaceutical Manufacturers Association, representing 95 percent of U.S. drug houses, was busy telegraphing committee members about the hazards it sees in a law that prohibits brand-name prescribing. To support PMA's argument that a brand

name is a sign of quality, Parke, Davis & Co. recently showed that competing generic versions of a potent antibiotic the company developed are less effective. Within a week, one of those competitors, McKesson & Robbins, announced it had recalled its total supply of the drug, chloramphenicol (p. 621).

Although the Long amendment was tabled this year, the Senate Finance Committee, of which Senator Long is chairman, sees it as only a temporary defeat. PMA expects its victory will be short lived. The amendment is expected to be reintroduced next year and observers say its eventual passage is inevitable.

Some of the language and spirit of the Long amendment was included in the current Social Security legislation. States purchasing drugs for patients under Title 19 (Medicaid) are instructed to do so with a view to "reasonable

cost," and the Secretary of Health, Education, and Welfare is authorized to experiment with methods of reimbursing those organizations that participate in Medicare and Medicaid programs to offer incentives for cost reduction. Under the new bill, HEW is also required to study the possibilities of implementing a generic drug law and to evaluate proposals for creating a Federal Formulary Committee to review drug costs and quality and write a list of approved products. HEW is already launched on such a study; its recommendations are expected before January 1969.

SURGERY

Three Girls Survive Liver Transplants

"Now we are three."

While world attention focused on heart transplants, the second of five baby girls making history with long-lasting liver transplants died in Denver at the University of Colorado's General Hospital.

Paula Kay Hansen, slightly over two years old, whose parents had brought her from their home in Fort Worth, Tex., for replacement of a defective liver Aug. 1, is the latest to succumb to the immunity problem—her body rejected and attacked the foreign tissue. Carol Lynne MacCourt, of Salt Lake City, died the day she was 16 months old after surviving her transplant two months. The longevity record is held by Julie Rodriguez, whose transplant was made July 23.

Dr. Carl G. Groth of Sweden, a Public Health Service international fellow in surgery, who assisted Dr. Thomas E. Starzl and half a dozen other surgeons and pediatricians with the transplants, says they are encouraged by the babies' survival records and plan to do further transplants as they are needed and as livers can be obtained.

The three still living—all two years old or less—are Julie Rodriguez of Pueblo, Colo., Kerri Lynn Brown of Long Beach, Calif., and Candy Barbaree of Orlando, Fla.

Before the present series of transplants, the longest life of a transplanted liver was in a 47-year-old merchant mariner named William Grigsby who lived 34 days before rejecting the organ.

In 1963, a Peter Bent Brigham Hospital team led by surgeon-in-chief Francis D. Moore of Boston had removed the cancerous liver of 58-year-old Joseph J. Bingel, a Dorchester, Mass., construction worker, and transplanted the liver of a patrolman named Edward C. Callahan, who had died from a pistol shot in the brain. But 11 days later, Joseph Bingel died.

Liver transplants have been attempted

in France and England, Dr. Groth says, but all patients have eventually rejected the foreign tissue or died of infection.

Dr. Groth will not compare the difficulty or importance of liver transplants with those of the kidney or heart, for example. "If you need a kidney, that is most important," he says. "There is no point in such comparisons."

But surgeons know that the liver is extremely complex. At three and a half pounds it is the body's biggest organ. It secretes bile for digestion, it breaks down protein into simpler compounds, stores blood sugar and fat, maintains chemical levels within the blood and cleanses the blood of foreign matter.

Auxiliary livers have sometimes been used in so-called "piggy-back surgery" in which the recipient's liver is undisturbed but aided in function by a second organ inserted in his abdomen.

The critical factors in achieving the long-term survival of the liver replacements in Denver has been a combination of antilymphocyte globulin (ALG) and immunosuppressive drug therapy. ALG is an extract of antilymphocyte antibodies. Lymphocytes are one type of white blood cells believed to be the specific agent that carries the body's immunologic assault against foreign tissue. Antilymphocyte serum is obtained

SST

Concorde Rolls Out

The Western World at last has a supersonic transport. Just one. It won't fly until at least the end of February, and it won't carry passengers until three years after that, but the idea has become a reality. The first commercial travelers to really get a look at the curvature of the earth will be those flying the Concorde, the Anglo-French SST whose prototype was rolled out of its hangar at Toulouse, France, last week for its first public display.

Sixteen airlines have so far ordered 74 Concorde (nine U.S. airlines account for 38 of them), and more sales will certainly follow. The U.S. Boeing supersonic transport will be almost 400 miles per hour faster, however, and up to 170 passengers bigger, and Concorde officials realistically acknowledge that the two planes are destined for different markets.

If SST proponents on both sides of the Atlantic are even partly right in their optimism, the Concorde should give enough of a boost to air travel to convert presently less-traveled routes into high-density ones. In 1974 or 1975 the U.S. plane will begin passenger service, and within two or three years it should have sewed up most of the Concorde's former business on high-density routes, simply because its 300-passenger capacity will make it more profitable on

from animals immunized against human lymphocytes.

Imuran and prednisone are two immunosuppressive drugs used, but by cutting off the immunosuppressive system, they lay the patient open to infection. He may not reject the transplanted organ but will die from pneumonia or some other disease.

Meanwhile, in Capetown, South Africa, Louis Washkansky was given a good chance for long-term survival with the heart of a woman beating in his chest. Also surviving is a 10-year-old African boy who received one of the same woman's kidneys as a transplant.

The American Medical Association's review of medicine for 1967 points out that although the "transplantation of internal organs is still a highly experimental procedure, kidney transplants have an increasing record of extending life usefully."

According to the journal *TRANSPLANTATION*, nearly 1,200 kidney transplants have been performed around the world. Among the patients receiving them, 55 percent survived one year or longer if donor and recipient were related. Among transplants done since Jan. 1, 1965, the year-or-longer survival rate has been 65 percent when donor and recipient are related.

such runs. When and if that happens, the Concorde will shift to less-traveled paths.

The American plane may actually be so efficient, according to W. J. Jakimiuk, president of Sud Aviation Corp., New York, the Concorde's French partner, that it will be priced out of the lesser-density routes. "One may forecast," he says, "that on such routes there will be no SST competition for Concorde, because the high productivity of the Boeing 2707 will make that aircraft very inflexible on any route where an airline's traffic potential does not exceed 100,000 passengers per year."

The Concorde will carry fewer passengers than many airliners now in operation, but it will cost passengers more to fly on it.

"Why should anybody fly subsonic if it costs no more to go supersonic?" asks the Concorde's deputy technical director, Dr. William J. Strang. "Regrettably," he says, "we conclude that a different fare will be used to protect the subsonic fleets."

The Concorde that go into commercial service will be nine feet longer than the 184.5-foot prototype. The Boeing aircraft has already grown 47 feet from its original conception, and its prototype has barely been started.

At first, Boeing had planned for its