drugs that haven't even been discovered yet.

In spite of the fact their origin is indiscernible just now, research in this direction is moving quickly because scientists have been able to get extremely pure isolates of R factor DNA, Dr. Falkow says. "Quickly" to a microbiologist means answers any time in the next 10 years.

Clinicians probably are not much closer to an answer to their question.

One way to cut down on drug resistance transfer is to stop prescribing antibiotics almost indiscriminately, but that is not an altogether workable solution, they agree.

Another thought is to eliminate, or at least greatly reduce, the use of antibiotics in animal feeds, thereby precluding transfer of antibiotics from animal to man as residues in meat. But antibiotics stimulate animal growth and increased protein manufacture—both desirable side effects.

Furthermore, there is little evidence to date to support the hypothesis that there is any real danger of R factor transfer from animal to man by this route, according to symposium scientists. Although they agree that more studies are in order, most see no reason for any new regulations of antibiotics in feeds.

This issue is being explored further at a second symposium this week in Washington, sponsored by the National Academy of Sciences and FDA.

A third answer to drug resistance lies in the development of drugs that would either inhibit transfer or clear infected genes of R factors before administration of antibiotics. Drug companies have been working in this direction—one has a patent application pending to combine acridine with tetracycline—but symposium scientists were skeptical of any immediate or wide-spread solution in this area.

ESRO's First Satellite

The language problems were formidable. A British contractor and a French subcontractor had to get along with German computer engineers, U.S. rocket scientists, Dutch astronomers and consultants from Belgium, Denmark, Italy, Spain, Sweden and Switzerland. Even among the central project group, documents had to be translated into four languages.

"It gets a little puzzling," admits Germany's Dr. Heinz Busch, "when an item or a system in one company is called a particular name, and in the very next company the same thing is called by another name." But overcoming such obstacles is standard operating procedure for the European Space Research Organization, whose first satellite was launched last week from Vandenberg Air Force Base in California.

It was a "textbook launch" in all ways—until the fourth stage of the U.S.-built Scout rocket failed to ignite. As downrange tracking stations waited in vain for a blip to appear on their radar screens, "indications of tumbling" were received from telemetry equipment on the satellite. It never got into orbit.

ESRO came into being with 10 member-nations on March 20, 1964, largely out of economic necessity. For any but the richest European countries to consider running their own individual space programs was virtually out of the question. The brain drain was making itself felt, as more and more European scientists were crossing the ocean to the extensive and lucrative U.S. space program, already past Project Mercury. "Our scientists must have their own satellites to work on, if we are to keep technically current," says Dr. Busch, ESRO's director of satellite projects.

With European satellites, even the construction itself is usually bid for by consortia, instead of by individual companies as in the U.S. One such was the European Satellite Team, formed last year to seek the contract to build a pair of ESRO satellites called TD-1 and TD-2, to be launched in 1969. The EST's members were companies from England, France, the Netherlands, Sweden and Italy, with General Electric retained as a consultant in the U.S.

ESRO's first satellite, which was actually ESRO II because ESRO I's observation schedule requires that it be held up until this fall, was built by a consortium including Hawker Siddeley Dynamics of England, Engins Matra of France and, as consultant, TRW Inc. of the U.S.

ESRO I's restricted launch date is planned to coincide with the long night over the North Pole. The satellite will be placed, also by a Scout rocket, into a polar orbit to study auroral phenomena at their fall peak.

Following the September launch of ESRO I, the organization's focus will shift to a pair of Highly Eccentric Orbiting Satellites called HEOS, which will come as close as a few hundred miles to earth, then swing out to almost 190,000 miles. Then come TD-1 and TD-2, to study stellar and solar astronomy, X-ray and gamma radiation. The last item presently on ESRO's schedule is LAS, a Large Astronomical Observatory weighing more than 1,800 pounds that may well be the first all-European satellite program, including the launch vehicle.

At present, ESRO has no plans to construct its own Cape Kennedy launch facility, though it does envision its own global tracking network. However, other sites than the U.S. may become available for launches in the future, including a French one now being built in French Guiana and the Italian floating platform off the coast of Kenya from which Italy's second San Marco satellite was launched.

There is even a multilateral European Launcher Development Organization at work on a booster called the Europa, but ESRO's satellite, which represents the goal of such a broad effort, has been stealing the publicity in a way that caused some wonder as to whether ELDO might not have vanished in a puff of smoke. Arnold Frutkin, the National Aeronautics and Space Administration's head of international affairs, is reassuring: "ELDO," he says, "like Bette Davis, is still around."

FROM CANADA

Measuring Quasars

Ever since quasars were discovered, astronomers have been puzzled as to their distance and the source of their tremendous energy.

Now Canadian radio astronomers have developed a refined technique for measuring the size of those baffling quasistellar radio sources. The method lets astronomers measure the angular diameter of quasars with unprecedented resolving power.

Details of the technique were reported to the annual spring meeting of the International Scientific Radio Union in Ottawa by Dr. J. L. Yen of the University of Toronto. The method is said to be so powerful that it could measure from the earth a source of radio waves the size of a man on the moon.

The size of a quasar radio source, a clue to its energy, can be measured by special equipment called a radio interferometer. Two antennas receive signals from the same source and then compare them. To obtain sufficient resolution to measure the small diameters of quasars, the two receiving antennas must be large distances apart.

Measurements have been made with antennas 80 miles apart (SN: 3/11), but better results are achieved when the receiving stations are even farther apart. This poses a problem because the links between the two antennas make it difficult to coordinate the signals.

The Canadians have overcome this with a technique where no direct link between the two stations is required. The signals received from the quasars at the two stations are recorded on ordinary magnetic tape and synchro-

nized to a fraction of a microsecond by means of an atomic clock. The tapes can then be brought to a central point for playback.

The Canadian team used the 150-foot radio telescope at Algonquin Park in Ontario and the 84-foot telescope of the Dominion Radio Astrophysical Observatory in Penticton, British Columbia, more than 2,000 miles to the west. A Defense Research 60-foot telescope at Shirley Bay, near Ottawa, was also used in the test.

With this equipment the scientists had a 2,000-mile line to determine the diameter of quasar 3C-273-B to less than 0.02 seconds of arc. They found its diameter to be about 100 light years, if the object is 1.5 billion light years away as determined optically, smaller than had been suspected.

The Canadian research team includes scientists from the National Research Council of Canada, the University of Toronto, Queen's University, Kingston, Ont., and members of the Dominion Radio Astrophysical Observatory.

FROM SWITZERLAND

Babel at WHO

Doctors attending World Health Assemblies in the future will have to deal with more languages.

The United Nations' professional agency, as other U.N. bodies, officially recognizes English, French, Russian and Spanish. But in practice, all the tons of working documents at every conference are run only in English and French.

At the 20th annual Assembly in Geneva, after several years of protest, the Russian-speaking and Spanish-speaking doctor-delegates won their case.

The 128-nation organization voted a resolution to "extend the use" of the two languages. It will cost $600,000 and will be accomplished "in progressive steps over a three-year period."

Many lengthy debates on medical and health questions are already confounded because the French-speaking delegates often question nuances of meanings in French working documents, as the English documents serve actually as the master copies.

Russian and Spanish will start being used in the first part of the next Assembly, then in the rest, and in the Executive Board.

Doctors from Taiwan, naturally, say they would like Chinese to be a working language, and the Arab League continues to fight for Arabic.

An African doctor-minister then says what about Swahili, "mother tongue of millions."

Shift at Commerce

In the nation's capital, there are very few sure things as far as executive appointments go, but one that has been as close to certain as possible for nearly a year is that Dr. Chalmers W. Sherwin will replace Dr. J. Herbert Hollomon as Assistant Secretary of Commerce for Science and Technology.

Dr. Sherwin has been deputy Assistant Secretary since last July. Dr. Hollomon has been both Acting Undersecretary of Commerce and Science and Technology Assistant Secretary since last February. Dr. Hollomon, who aimed the science-oriented agencies within Commerce on an industry-oriented path during his five years, has been named president of the University of Oklahoma as of Sept. 1.

Until July 1966, when he became Dr. Hollomon's deputy, Dr. Sherwin had been director of defense research and engineering for research and technology since 1963, and had previously served as deputy chief scientist for the Air Force.

While at the Department of Defense, Dr. Sherwin suggested in 1964 that DOD investigate the kinds of research on which most of today's defense systems are based. One conclusion drawn by scientists on what came to be called Project Hindsight (SN:12/3/66) was that virtually all of the basic research on which the 20 major weapons systems selected for study were based was at least 20 years old, and much of it had been available for 30 years.

Basic science is defined in the Project Hindsight report as "undirected," from which the contributions appear "to have been small." This makes Dr. Sherwin a technology man, but he does not disregard the value of basic research.

Dr. Sherwin's Commerce appointment, generally considered a demotion, was believed at the time to be a prelude to naming him as a replacement for Dr. Hollomon. It was a long wait for both of them. Rumors that Dr. Hollomon was leaving Commerce had been circulating for several years.

Dr. Sherwin will direct the activities of such agencies as the Environmental Science Services Administration, the National Bureau of Standards, the Patent Office and the Office of State Technical Services, under the newly appointed Secretary of Commerce, Alexander B. Trowbridge.

Secretary Trowbridge has made it clear that he plans to make Commerce a Government department serving industry. Dr. Sherwin is expected to follow this same policy, established as far as the science agencies are concerned under Dr. Hollomon.

Dr. Sherwin is reluctant to discuss