will now be able to test alcohol, barbiturates, cocaine, marijuana and other drugs to see if or how they cause exocytosis in the adrenal gland. And Dr. Schneider's work also offers a promising means of developing and testing agents that may curb or inhibit this exocytosis and therefore the damaging effects of amphetamines and other drugs. □

THE AUTOMOBILE

Is the revolt starting?

There have been growing indications that much of the public is getting fed up with many aspects of a consumer civilization—including especially the automobile, its noise, congestion and air pollution. A revolt may be brewing —with the first skirmish right in the heart of automobile country.

Highland Park, Mich., on the northern edge of Detroit, is a minority group community of 30,000, entirely surrounded by the larger city. It has six north and south streets—which have become major traffic arteries for commuting suburbanites who live to the north and pass through Highland Park on their way to and from work.

As a consequence, says Eduardo Rabel, an engineer with the city's public works department, the quality of life in Highland Park has seriously eroded. So Highland Park decided to do something.

On Aug. 7, Second and Third Avenues, one-way streets that are the major arteries through the small city, were effectively closed off as thoroughfares; the city installed stop signs at every corner of the streets—about 20 initially, says Rabel. Only two of the six streets were left open for through traffic.

Highland Park has a Chrysler Corp. plant within its city limits. But, says Rabel, the citizens demanded an end to the traffic congestion. "They want to bring back neighborhood quality."

The commuter problem in Highland Park has existed since the 1940's, says Mayor Robert B. Blackwell. He says Detroit officials claimed it would be ameliorated with, first, the completion of a north-south freeway in the late 1950's, then, again, with the recent opening of the new Chrysler Freeway. Neither promise materialized, says Blackwell; the freeways, as has been the case elsewhere, simply generated more traffic.

How well the Highland Park experiment will work, no one knows. A city representative said Tuesday that traffic counts will not be taken for two weeks; by then, he hopes, commuters will have realized Highland Park is not the way to go, and they will have chosen other routes. □

IMMUNE RESPONSE

Gestation, aging and cancer

A vaccine is an extract of a foreign microorganism (bacteria or virus). It is injected into a person to produce a protective response (antibodies). Then, if the vaccinated person later comes into contact with the microorganism, the warrior antibodies are already formed, ready to fight the disease.

Such is the philosophy that has led to the development of sundry vaccines for infectious diseases. It is what youngsters learn about vaccines in basic health or biology classes. Yet while research to devise still more viable vaccines along these classic lines continues, scientists are also working on the basic questions: How does a cell recognize a foreign substance (antigen)? How does the cell make antibodies respond to the antigen? Why does the cell sometimes accept (tolerate) the foreign invader?

Some of the latest facts and speculations surrounding these questions, presented at the First International Congress of Immunology in Washington last week, may shed light on several important health problems—immune responses by mothers to their fetuses, aging and cancer.

Some scientists view the fetus as a naturally occurring tissue transplant and wonder how it gets around graft rejection. Dr. Ted Breyere and his team at Sibley Hospital in Washington looked for immune response by rodent mothers against their fetuses and found just the opposite—immune tolerance. Tolerance, Dr. Breyere reported, still eludes definition. Possibly the spleen in the mother produces antibodies (proteins) that coat the placenta, protecting her from fetal antigens (proteins or carbohydrates). To prove it would require isolation of maternal antibodies from the placenta, or of fetal antigens from the amniotic fluid. But that has not yet been achieved.

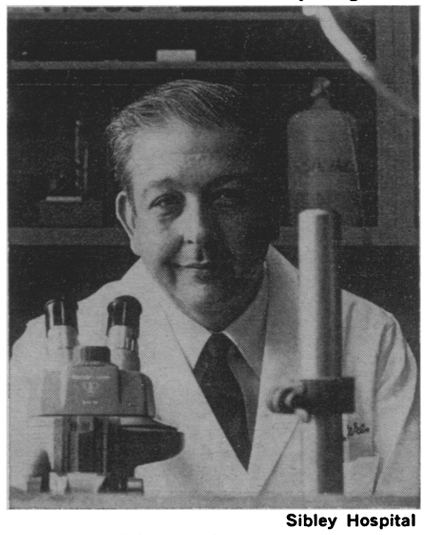
Dr. Breyere believes that a better understanding of maternal fetal immune tolerance might improve the chance of successful skin grafts and organ transplants. Dr. Breyere found that immediately after giving birth mother rodents accepted skin grafts from their progeny, and these grafts often held for a year.

Dr. Breyere also believes that maternal fetal immune tolerance might reduce eclampsia, a toxic reaction of pregnancy marked by convulsions and coma, which is believed to be a response, perhaps an immune response, of mother against fetus. Eclampsia occurs more often with first pregnancies. This evidence agrees with results of Dr. Breyere's animal studies that maternal tolerance of the fetus increases with the number of offspring produced.

In fact, if maternal fetal tolerance were understood, Dr. Breyere says, it might help control cancer. Both fetuses and cancers, he explains, share the properties of growth and invasion, and antigens found in the fetus and placenta are the same as those produced by some cancers. This statement is underscored by Dr. Phil Gold of McGill University in Montreal, who reported at the meeting that, on the basis of 4,000 biopsies, an antigen specific to colon and rectal cancers was also found in the pancreas, liver and gut of women in their second and third trimesters of pregnancy. Why an antigen specific to colon and rectal cancers is also found in tissue from pregnant women is a pressing question, since efforts are being made to use the antigen for early detection of colon and rectal cancers (SN: 7/31/71, p. 78).

Some scientists at the congress, such as Dr. Roy Walford of the University of California School of Medicine at Los Angeles, believe that chronological aging results when immune defenses break down, eventually leading to disease and death of an organism. Dr. Edmond Yunis of the University of Minnesota at Minneapolis, however, reported that chronological aging (or what he calls primary aging) could be due to either immunological decline, or to total collapse of the genetic apparatus, but that aging associated with disease results from a breakdown of immune response.

Dr. Yunis worked with eight strains of naturally long-lived and short-lived mice. Only the latter showed a decline in antibody production before they lived out their normal life span. This antibody production breakdown resulted from atrophy of the thymus gland. "My work," Dr. Yunis reported, "shows that mice, and probably men as well, are not born with comparable immune defenses. There are mice and men who are old when young and



Sibley Hospital

Breyere: Why mother fetus tolerance?

young when old, immunologically speaking."

Dr. Yunis is now injecting lymphoid cells and thymus glands into short-lived mice. He is also applying thymus grafts to them to explore the possibilities of engineering or reconstituting the immune response, and hence arresting or retarding secondary disease-associated aging.

Dr. Walford reported that animals who eat less are less prone to cancer, and that the same may be true of humans. When he fed just-weaned rats and mice only one-third a normal laboratory diet of calories but full doses of vitamins, minerals and other essential nutrients, they lived 50 to 100 percent longer than the normal two to three years, and developed 10 to 60 percent fewer cancers.

Dr. Walford's main interest is determining how a leaner diet, long life span and less cancer mesh with immune defense. Paradoxically, he said, a smaller diet reduces animals' immune response, although it is high immunity that is usually considered protective against cancer. □

EARTHQUAKE CORRELATIONS

The wobbling earth

As the earth spins on its axis, it wobbles slightly, so that the poles of rotation describe rough circles 20 to 30 meters in diameter around the geographic poles in a period of 14 months. This is called the Chandler wobble. The daily shift of the pole reaches a maximum every seven years. This shift, as much as six inches per day, has been measured daily by astronomers since 1900.

The cause of the wobble is unknown, but the British scientist John Milne suggested in 1893 that there may be a connection between the polar motion and major earthquakes.

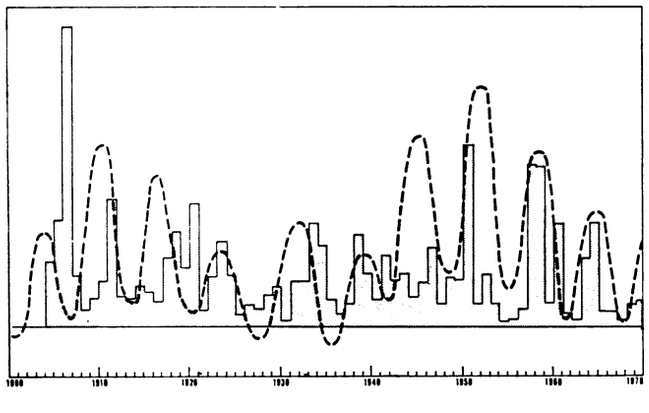
Earlier this year, Dr. Charles Whitten, chief geodesist of the National Ocean Survey, who has correlated total energy released by recorded earthquakes during the past 70 years with the daily movement of the pole, predicted that this year's earthquake activity should be a maximum because 1971 is a peak year in the seven-year cycle of polar motion.

New data released Aug. 3 by the National Oceanic and Atmospheric Administration's National Earthquake Information Center seem to confirm this prediction. According to NEIC seismologist Carl Von Hake, the amount of energy released by earthquakes this year from Jan. 1 through July 26 already exceeds that released in any one year since 1964.

Four major earthquakes have already occurred this year. These included three of Richter magnitude 8.1—one in New Guinea in January, one in the Solomon Islands and one in the New Britain Island area of the southwest Pacific in July. Also in July, there was a shock in Chile of magnitude 7.8. Three earthquakes of magnitude 8.1 have not occurred within a single year since 1950, another peak year.

Among scientists who see a correlation between wobble and earthquakes, some believe the quakes contribute to the earth's wobble, and others think the polar shift may trigger earthquakes. Dr. Whitten believes it may work both ways: The shift may trigger earthquakes which in turn increase the polar wobble. But he is not suggesting earth's wobble as the sole cause of earthquakes. "Many things undoubtedly enter into it, including the shifting of the earth as strain builds up beneath the surface and possibly even the pull exerted on the earth by the moon and sun. But when you add to this the earth's wobble as it reaches its maximum, you have another apparently tremendous force which may trigger earthquakes."

One problem in drawing correlations between polar wobble and earthquakes is that the various sources that measure wobble show discrepancies of as much as 0.1 second of arc. Part of the international Earth-Physics Satellite Observation Campaign, to begin next month, will include a 14-month effort to measure the Chandler wobble more precisely with laser observations from orbiting satellites. □



Earthquake energy (shaded area) and mean daily shift of the polar wobble: "A definite correlation."

NOAA

WATER POLLUTION

Muskie package to Congress

Sen. Edmund Muskie's subcommittee on air and water pollution reported out the expected 1971 omnibus bill on water pollution last week. It has a number of features which will appeal to environmentalists, but it also retains some criticized provisions of older laws.

Some of the new provisions:

- More money for construction grants for sewage treatment—$20 billion in Federal funds over the next five years. The emphasis is to be on innovative techniques for recycling and reclaiming wastes.
- Incentives for states to develop control of non-point sources of water pollution, primarily agricultural runoff.
- National water quality standards, to take effect by Jan. 1, 1975, after development of implementation plans. In the meantime, less-stringent 1965 water quality standards would apply.
- A flat prohibition against discharge of toxic pollutants, unless small amounts are determined to be harmless.
- Uniform national standards for 29 new sources of water pollution, formulated on the basis of available abatement technology.
- Emphasis on regional, rather than local, treatment facilities.

The aim of the bill is "the maintenance of the chemical, physical and biological integrity of all waters, including lakes, streams, rivers, estuaries and the oceans." This goal is to be accomplished by Jan. 1, 1980.

The permit and penalty provisions of the 1889 Refuse Act are retained in the new bill, although they would be under the administration of the Environmental Protection Agency instead of, as currently, the Army Corps of Engineers. Environmentalists have criticized the refuse act as providing "licenses to pollute," although its workability as an antipollution statute has not yet been fully tested.

The bill also retains criminal penalty provisions for polluters and makes the provisions even more stringent. Such provisions have been attacked as essentially vengeful and moralistic; instead, say critics such as Sen. William Proxmire (D–Wis.), fees realistically tailored to actual abatement costs—and earmarked to pay such costs—might work a lot better than arbitrary fines or jail sentences.

Scientists at Michigan State University and elsewhere have suggested, however, that charging industries fees for wastes put into municipal sewage systems—in the manner envisioned in the new bill—is the wrong approach (SN: 4/24/71, p. 286). Instead, they say, industries should clean up wastes before dumping effluents into the systems. □