The card indicates that Sakharov has received at least one major paper from the West (and so possibly more), presumably by the ministrations of the so-called Sakharov Underground. Lipkin's paper has to do with the masses of the subatomic particles: how the masses of the quarks (out of which the subatomic particles are supposed to be built) should be added and subtracted to make up the masses of the subatomic particles that are observed (quarks being unobservable). This is a field in which Sakharov has made noted contributions (his calculation of the masses of the charm particles, for instance).

Sakharov comments on one of the methods for calculating the particle masses and takes sides with Lipkin in a controversy that surrounds it. Even allowing for the brevity of space on a postcard, the statement is forthright and seems to come from a mind confident of its currency and its powers. He does not buffer it all over with qualifiers.

As a day in the life of Andrei Dmitrievich this is no extensive addition to scientific literature, but it is a signal that Sakharov can still work, somehow. □

Further trimming of gene-splice rules

As part of the steady trend of easing safety regulations on recombinant DNA research, the national Office of Recombinant DNA Activities has now removed itself from some of the routine supervision. But the local "biosafety" committees, to whom the responsibility has been shifted, also want to lighten their workload. At a meeting in Washington Nov. 24 and 25, for example, the heads of those local committees agreed that the time and effort they spend at their task of reviewing protocols of experiments planned by scientists at their institutions is out of proportion to the low risk of the experiments. They suggested that one or two people at each institution could handle the job more expediently.

In the Nov. 21 FEDERAL REGISTER, Donald S. Fredrickson, director of the National Institutes of Health, announced that the national Office for Recombinant DNA Activities (ORDA) would no longer review, register or approve most experiments, leaving that responsibility to local biosafety committees (in spite of the local committees' desire to give it to one or two local officers). The national office would still assign safety levels to experiments not explicitly covered by the guidelines and to experiments requiring case-by-case review, such as those involving large-scale production or exceptions to guideline provisions.

Trust in the local biosafety committees was an important factor underlying the procedural change. "By now, Institutional Biosafety Committees have accumulated sufficient experience with and knowledge of the Guidelines to operate as independent review groups," says Maxine Singer, the National Cancer Institute biologist who proposed the new registration requirements.

Sixteen of seventeen letters received in response to the proposal (published Aug. 21) support the change, Fredrickson says. The letters say that review solely by the local committees will be simpler and just as effective as the more complex review procedures. One letter suggested that the change would leave the national office with more time to spend determining policy, and another stated that the more complex system of review was " ... counterproductive because bureaucratic requirements seen by investigators to be clearly unnecessary lead to disrespect for regulations that should be respected."

The one letter opposing the changed registration procedure argued the importance of centralized files on the research, because "somebody should know what is going on."

During their Washington meeting, the biosafety committee representatives expressed willingness in one of a series of straw votes to send to NIH a short annual report listing experiments done at each institution requiring the top (P3 and P4) safety precautions, and the representatives split on willingness to include in such a report lower containment (P2) research.

The strongest message the attendees had to send to the national Recombinant DNA Advisory Committee was that they believe work with recombinant DNA will not generate anything more hazardous than its starting materials. All the information collected on recombinant DNA since the early days of uncertainty and public concern have diminished scientists' expectations of risk, says Ed Adelberg of Yale University's institutional biosafety committee. The attendees urged the national committee to exempt from the guidelines all experiments using the disabled bacterium *Escherichia coli* K-12, for example. Work with that microorganism, which includes the vast majority of current recombinant DNA experiments, now requires the lowest level of safety precautions (P1 containment). "That classification provides only red tape and paperwork, not safety," one scientist charged.

Although the meeting participants say that local biosafety committees are not justified by the risk of hazards arising from recombinant DNA research, they were able to suggest at least one useful role for the groups — a public relations job. The presence of the committees, which include representatives of the community such as an official of the local health department, can allay public fears of recombinant DNA research. Ray Thornton, chairman of the Recombinant DNA Advisory Committee, says that the national committee will consider the suggestion of replacing the local groups with single biosafety officers. But he warns that major departures from the established structure could destroy public confidence that has taken years to develop. □

Redesigned Soyuz orbits 3 cosmonauts

On June 30, 1971, the Soviet Union's 18th manned spacecraft, Soyuz 11, was returning to earth with its crew, cosmonauts Georgiy Dobrovolskiy, Viktor Patseyev and Vladislav Volkov. After nearly 24 days in orbit, the trio was coming home in triumph as the first human beings ever to live in a space station, having spent most of their time as the initial occupants of Salyut 1. Just half an hour before touchdown, however, tragedy struck: A malfunctioning seal caused a sudden depressurization of the Soyuz cabin, and the three cosmonauts died, unprotected by the bulky spacesuits that would have taken up too much room in the crowded craft.

Although initial Soviet reports following the catastrophe identified no structural failures, a major Soyuz redesign and test program resulted, so exhaustive that it was 27 months before cosmonauts again ventured into space — and this time in pairs, fully protected by spacesuits. Even in recent months, when as many as four cosmonauts at a time have occasionally shared quarters aboard the Salyut 6 station, the teams have commuted between earth and orbit in twos. Until last week.

On Nov. 27, the first three-cosmonaut crew in nearly a decade took off aboard the latest version of the Soyuz and docked a day later with Salyut 6, whose previous occupants had set a 185-day record for time in space. Observers speculated that Leonid Kizim, Oleg Makarov (a veteran of two previous flights) and Gennadiy Strekalov might attempt a still-longer stay.

The new Soyuz, designated "T" for transport, was first flown last December in an unmanned version that successfully docked with the Salyut to bring a load of supplies. On June 5, Soyuz T-2 delivered — and subsequently brought home — a two-man crew (SN: 6/14/80, p. 373). The craft launched last week was designated T-3, 39th in the Soyuz series and the 47th Soviet spacecraft (including six Vostoks and two Voskhods but not the Salyut stations) of man-carrying design.

The changes in the T-series vehicles from earlier designs are substantial. "Whereas only individual systems were modernized up until now," according to Soviet news agency quotes from Vladimir Shatalov, in charge of cosmonaut training, "this time virtually all systems have been put through modernization." Increased use of microelectronics has reportedly

enabled lighter-weight equipment, reducing fuel usage during maneuvering (fuel limitations have been blamed by some observers for at least one failed attempt by a manned Soyuz to dock with Salyut 6), and the attitude-control system is said to be more responsive. Most significant, however, appears to be a greatly improved on-board computer. Limitations in past computer designs for years kept cosmonauts so dependent on guidance and even on control from the ground that some U.S. manned spaceflight officials refused even to call the early Soyuzes "spacecraft," instead referring to them merely as "space capsules." The T-series computer, according to Shatalov, "will free cosmonauts to the maximum from performing routine operations." "Routine operations," in fact, may include even docking procedures, which have been performed automatically by computer on some recent unmanned supply flights and reportedly aboard Soyuz T-3 last week.

As Soviet manned spaceflights grow in number, duration and sophistication, the U.S. National Aeronautics and Space Administration is preparing for what will be the first spaceflight by American astronauts since the July 1975 ending of the U.S.-Soviet Apollo-Soyuz Test Project. At Kennedy Space Center in Florida, the winged, crew-carrying section of the U.S. space shuttle was recently transferred from its own "orbiter processing facility" to the huge Vehicle Assembly Building to be mated with its huge external fuel tank and strap-on rocket motors. Additional delays in the oft-stalled project are still possible, but NASA is now working toward an "internal date" of March 14, 1981, for the shuttle's first trip to orbit. □

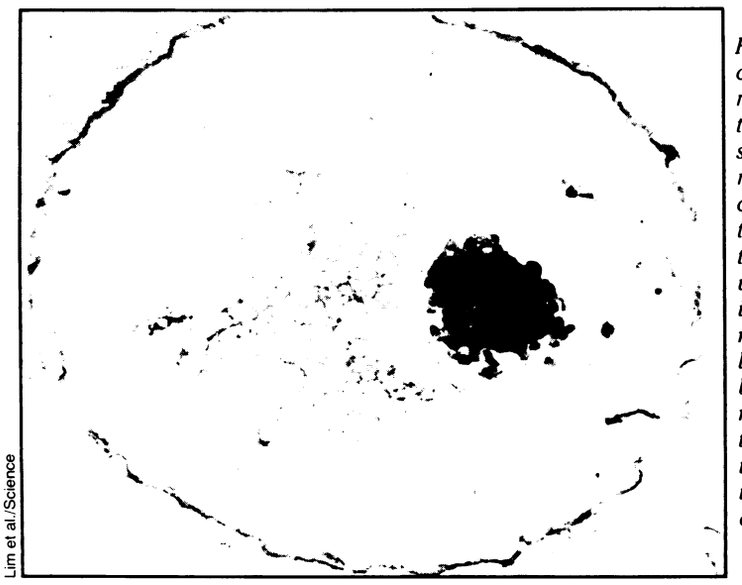
Artificial pancreas: Closer to reality

Insulin-dependent diabetics may be receiving dramatic new help several years from now in the form of an artificial pancreas, a number of which are now being developed. Such artificial organs would substitute for daily insulin injections.

In 1979 Clark K. Colton of the Massachusetts Institute of Technology reported that he and his colleagues had grown insulin-producing pancreatic cells from rats on the outside of semipermeable, tubular membranes and had implanted the membranes as a shunt between artery and vein in rats. Blood coursing through the tubular membranes provided oxygen and nutrients to the pancreatic cells, but immune cells in the blood could not cross the membranes and reject the pancreatic cells. The cells produced insulin and regulated host animals' glucose production (SN: 9/22/79, p. 200).

Last summer, Paul E. Lacy, Joseph M. Davie and Edward H. Finke of Washington University Medical School in St. Louis reported that they had incubated rat pancreatic tissue to kill immune cells surrounding the tissue, which are effective in triggering pancreatic tissue transplant rejection in an animal host. They had introduced the pancreatic tissue into the bloodstreams of diabetic mice, and had injected the mice with antibodies against immune cells to further prevent their immune systems from rejecting the foreign transplant tissue. The pancreatic cells lodged in the mice's livers and successfully controlled blood sugar levels in seven out of 10 of them. The levels were still under control after 16 weeks (SN: 7/19/80, p. 36).

And now still another promising artificial pancreas for diabetics is reported in the Nov. 21 SCIENCE by Franklin Lim of the Medical College of Virginia in Richmond and by Anthony M. Sun of Connaught Research Institute, Willowdale, Ontario, Canada. Lim and Sun have enclosed rat pancreatic cells in tiny semipermeable membrane capsules. The capsules allow insulin out, but will not let immune cells that can reject the foreign pancreatic cells in. Lim and Sun then transplanted the microencapsulated pancreatic cells into diabetic rats and found that they corrected the diabetes for two to three weeks.



Lim et al./Science

Rat pancreatic cells (dark mass) contained in a semipermeable membrane capsule function for two to three weeks when injected into diabetic rats. Capsule lets insulin out but prevents reaction between pancreatic cells and immune system cells.

Investigators involved in this line of research generally take a favorable view of each other's approach toward the same goal. Colton, for instance, told SCIENCE NEWS that the various approaches are "worth pursuing," although only time will tell which one might prove helpful to human diabetics. Davie sees the tack of placing foreign pancreatic material into mechanical devices to keep the material from being rejected (as opposed to suppressing a host's rejection of the material) as "an interesting alternative." Lacy concurs. As for Lim, he says the work of Lacy and colleagues "sounds very exciting."

However, these researchers do have some criticism of each other's endeavors toward the same goal. Lim, for example, views the solution of Colton and company "as a very temporary thing" because he does not believe that it will be practical to implant a pancreatic shunt in humans for a long period of time. Lim also points out that the approach of Lacy and his coworkers has not been successfully duplicated by other scientists although a number have tried to do so. Davie confirms this observation. He is quick to stress, though, that an Australian researcher has achieved the same success his group has by using a slightly different culturing technique. Colton, in contrast, emphasizes that whereas Lim and Sun's approach is promising, it still has some areas in need of investigation. For instance, when pancreatic cells are encapsulated, a layer of fibroblast cells can form over them, which in turn might possibly create a barrier to insulin diffusion out of the pancreatic cells into a host. As for Lim and Sun, Davie contends, they need to extend the success of their technique beyond two or three weeks, which they will probably do with more research.

What progress have Colton and colleagues and Lacy and colleagues made since they reported their successes in 1979 and last July? Colton says that "ours is still looking good." Davie reports that his group has now gotten pancreatic tissue to be accepted by animals for up to a year instead of for only 16 weeks, and that they have also found that the immune cells surrounding pancreatic tissue that stimulate rejection of the tissue in a host are T cells and macrophages, not B cells. This finding, which surprised them, is in press with DIABETES.

The ultimate goal of these three scientific groups, of course, is to try out their versions of an artificial pancreas in human diabetics. Such clinical trials could come as early as two years from now, Lim estimates. "I already have a list of volunteers who would like to participate," he says. □