Russians and Americans Gather to Talk Psychobiology

Science is supposed to be free of ideology, but a subject with such far-reaching implications as the study of brain and behavior is hard to keep totally clear of political perspectives.

So much was evident from the first Soviet-American meeting on psychology held last month at the University of California at Irvine, attended by 10 Soviets and about 30 Americans, which was sponsored by the two countries' respective academies of sciences.

Some Americans were initially skeptical that much could be gained from such a conference, but after 8 days of intellectual exchanges, soldered by evenings of well-oiled camaraderie, most felt it had been worth the trip.

Experimental psychology is a particularly interesting area for Soviet-American exchange because, as one participant said, "Understanding the neural and behavioral sciences touches on our philosophies of life and science in general." The context of Russian studies of psychology was formed by the "Pavlovianization" of Soviet science under Stalin in the 1950's. There is a strong deterministic and environmentalist cast to the Russian approach, which reflects the political philosophy that human beings are creatures whose behaviors are totally susceptible to being shaped by society. This does not mean the Russians are not doing good science, but, by American lights, their adherence to particular schools of thought has resulted in an imbalance in their interests. At the Irvine conference, for example, Americans made considerable reference to neurotransmitters, but discussion of neurochemistry was totally absent from the Soviet papers.

The title of the conference, "Neurophysiological Mechanisms of Goal-Directed Behavior and Learning," reflects the Soviet slant to the topic. To the Soviets, "goal-directed" is a key term; as far as the Americans were concerned it might as well have been left out. One explained that it pertains to behavior directed at "any biologically significant goal"—such as food, sex, or homeostasis. Asked what non-goal-directed behavior was, he explained that it could apply to a pure unconditioned reflex (such as pulling one's finger away from a hot stove). But another explained that that, too, is goal-directed, because it is built into the nervous system. At any rate, the point of the conference was to discuss how the central nervous system functions to produce learned, goal-directed, or just plain behavior.

American participants at the conference included several of the country's leading brain researchers, such as Neal Miller of Rockefeller University, Karl Pribram of Stanford, and E. Roy John of New York Medical College. But the name that loomed the largest was that of Ivan Petrovich Pavlov, the Russian physiologist who died in 1936 and who is to Russian psychology what Freud is to psychoanalysis. Americans were surprised at how dominant he remains. "I couldn't have guessed how alive Pavlov was to them," said one.

The Pavlovian standard-bearer was E. A. Asratyan, 74-year-old director of the Institute of Higher Nervous Activity and Neurophysiology. Asratyan is almost a living relic, an individual who made good in the Soviet system and embodies a compatible union of science and political dogma. Born an Armenian, he escaped the Turkish massacre of 1915 by disguising himself as a girl. He fled to Russia, where he was educated and spent 10 years in Pavlov's laboratory. A staunch Communist of enormous energy and cordiality, he lost no opportunity to propagandize his fellow conferees. Whenever he managed to score a point for the Soviet Union he cried "Dialectic!" and laughed hugely. Similarly, he would jump up after a paper had been presented and declaim (to the amusement of the audience), "Thank you for showing Pavlov right!"

Soviet thinking, however, is no longer as monolithic as it was even a decade ago. "They used to have to start every paper with how nice dialectical materialism was and how Pavlov was the father of all thought," says Michael Patterson of the University of Ohio, one of the half-dozen young Americans invited to complement the showing of established heavies. Now, he says, clear differences are beginning to appear. A new generation of post-Pavlovian thought is gaining eminence, formulated by P. K. Anokhin, who died a few years ago. To a Pavlovian, conditioned reflexes form the basis for all behavior, and all complex behaviors can be broken down into chains of reflexes. The followers of Anokhin put reflexes more in the context of hierarchies and "functional systems." They say every response in the brain results from an interaction between selected aspects of the environment and an internal representation of the "goal."

The Soviets regard themselves as taking a more "holistic" approach to brain functions than the Americans. They talk much of systems and little of synapses (the gaps between neurons through which impulses pass). They put great emphasis on the interaction between organism and environment in the formation of these systems. They have a fondness for grand theories into which to fit their findings. Americans, on the other hand, are more molecularly oriented, more empirical, and wary of global hypotheses. As one said, "There's only one field where you can be a great theoretician without much data, and that's psychology."

E. Roy John, one of America's few

Marie Grinder Photo

Soviet scientists B. F. Lomov (second from left) and E. A. Asratyan (second from right) with Americans Frances Graham, Robert Thatcher, and Michael Patterson.

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global hypothesizers, stirred a great deal of interest among the Russians. He says the activities of single neurons have no meaning except as they contribute to larger neuronal "ensembles," which in learning become parts of larger "representational systems." He explains that his theory—which includes the idea that isolated neural activity cannot be understood outside the context of larger systems—bears the same relationship to prevailing concepts as quantum or probability theory does to Newtonian mechanics.

John said he was "delighted at the Soviet response to my work" and had not been aware until now that he and the Russians were doing work that confirmed each other's. One reason is that although Soviets follow American journals extensively, little Soviet work is translated into English. Most Americans only read articles that Soviet colleagues send them, provided they are not in Russian.

Basic scientific research in the USSR is conducted primarily, although not exclusively, by the Soviet Academy of Sciences, which has 200 research institutes. Medical and agricultural sciences have their own institutes. Little research is university-based and few of the research scientists, at least the ones at the Institute of Psychology, do any teaching.

The two institutes represented at the meeting were the Institute of Higher Nervous Activity and Neurophysiology ("higher nervous activity" is the Pavlovian term for behavior) and the Institute of Psychology. Their activities overlap in the areas covered by the conference. Much of what is regarded as basic psychology in the United States is conducted in the Soviet Union by neurophysiologists. All basic research related to mental illness is in the Academy of Medicine.

The psychology institute was formed only 6 years ago because the time had come, according to its director, Boris Lomov, for a "synthetic" or holistic approach to psychology. The institute is divided into five departments—on the philosophical problems of psychology, general psychology (including perception, memory, and mathematical psychology), social psychology (this includes, for example, field studies of cooperative group behavior), the psychology of work (industrial psychology, or how to raise labor productivity), and psychophysiology (the department represented at the conference).* The concept of mental health is not one that plays a part in Russian research on psychology. Part of what Lomov means by a holistic approach is that neurophysiology is the bottom line, so to speak, where (it is hoped) all processes, including those in the realm of social psychology, can be illuminated.

At the conference, the matter of politics was one whose ugly head was kept below the surface for the most part. The Soviets were not interested in getting into dialectical disputes; indeed, when

*The Russians are very interested in developmental psychology as it relates to education. This work is conducted at the Academy of Pedagogical Sciences.

Briefing

Academy Group Goes on Human Rights Mission

President Jorge Videla headed the list of Argentine officials who made time for the National Academy of Sciences' committee on human rights during a visit in March. The committee was also accorded high level treatment in Uruguay.

The committee was founded a year ago in response to an evident demand among the academy's membership that it add a public channel to its traditionally private means of seeking to aid oppressed scientists (*Science*, 13 May 1977). The committee has now adopted 16 scientists and scholars whose situation is "particularly grave and well documented." Five are in Argentina, three in the Soviet Union, four in Indonesia, two in Czechoslovakia, and one each in Uruguay and Mali.

The visit to Argentina and Uruguay did not produce the release of any prisoners but the academy group felt it was worthwhile. The group returned, says its trip report, "with a realistic but not necessarily optimistic view of what private groups can accomplish in advocacy for human rights." The military governments of Argentina and Uruguay are concerned about their image and not impervious to public opinion at home and abroad. "The group concluded that most of the possibilities for NAS Committee activity are small and of limited visibility. But however small, consistent human rights actions are catalytic and cumulative."

In Uruguay the group was allowed to pay a visit to its adopted prisoner, mathematician and communist party member Jose Luis Massera. Massera, aged 63, is said to have undergone a prolonged period of torture, but the group reports only that he was "alert and interested in rejoining the mathematics community outside his country." The military judge before whom Massera is being tried received the academy group and said that their pleas on Massera's behalf "could be viewed in a positive manner" when the case is decided. A curious and unsettling event occurred while the committee was in Buenos Aires. Like many of Argentina's "desaparecidos"—the people who disappear—a prominent research hematologist named Beatriz Iparraguirre de Weinstein was abducted from her home at 3 a.m. by the usual group of armed men in unmarked cars claiming to be "from the police." The family's protests produced the usual official denial that any government forces were responsible. The family then asked scientists, including the academy committee, to take up Iparraguirre's case with the government. Eight days later she was set free, at night, on the streets of Buenos Aires. Officials suggested that the operation was a hoax to embarrass the government, an explanation the group had difficulty in accepting because of the large numbers of people who even now disappear in the same way.

The group spoke with the local organizers of the International Cancer Congress scheduled to be held in Buenos Aires this October. Several hundred scientists in both America and Europe have said they will boycott the conference in protest against the human rights violations suffered by scientists and others in Argentina (*Science*, 10 February 1978). The academy group believes that a boycott is not the most effective tactic; a better course would be for scientists to attend the conference and use the opportunity of protesting to the government on behalf of oppressed scientists.

Academy Makes a Late Election

Among the 60 new members elected by the National Academy of Sciences last month was Andrew V. Schally of the

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anything remotely political came up, their tendency was to withdraw. Midway through the conference a small group of Irvine students requested an audience with Lomov to talk about human rights and the Jewish right to emigrate. The meeting was short and uneventful. "I didn't understand what they were talking about," said Lomov later. As for nonpolitical matters, the Russians thought Disneyland was great, were appalled at the high prices everywhere, were eager to load up on blue jeans, and—in contrast to Americans—did not think much of *Star Wars*. "Technically very interesting," several said diplomatically. "I hate war—we should propagandize peace and love," said Asratyan.

By the end of the conference a good deal of conceptual confusion remained, but the Americans and Soviets had reportedly gained a much better idea of where they stood in relation to each other. Said one American, "The big difference seems to be that the Americans have small theories and lots of data, and the Russians have large theories and much less data."

One thing a conference like this highlights is the importance of building into the schedule opportunities for participants to have personal interchanges. As every good conference-goer knows, the real communication occurs over the meals, at the bars, and in the Jacuzzis.

Eight days of intensive intellectual and personal contact reduced the initial skepticism of some Americans. One scientist, intimately familiar with Asratyan's work, said he came to the conference fully intending to denounce the Armenian for deviation from Pavlovian thought—an indirect reprimand for Asratyan's denouncement of fellow scientists for being non-Pavlovian in the 1950's. But when he met the man, he was "totally disarmed." Asratyan regaled him with his life history—"I was melted," says the formerly critical scientist. Now he wants to visit a Russian lab.

Another scientist, John Lacey of Fels Research Institute in Ohio, arrived feeling a little cool. "They haven't got a thing to teach us so far as I'm concerned," he said. "They're not doing a thing we're not doing and they're doing some things far worse." By the end, his basic assessment had not changed but his attitude had. He found the quality of most papers "astoundingly good." Plus, said Lacey, "I've changed my negative view of meetings—that all they do is take research money." Now he is all for more détente-type things.

Richard Thompson, chairman of Irvine's psychobiology department and host of the conference, was "ecstatic." "We didn't learn any specific new facts but we got a feel for the kind of approach they have." He says that it looks as though there may be a possibility for exchanges of scientists between Irvine and the laboratories of Asratyan and of V. B. Shvyrkov of the Institute of Psychology, who was the leader of the Anokhin camp.

Some piquance was added to this conference by the fact that it came within a

Briefing

Veterans Administration Hospital in New Orleans. What distinguishes Schally from the 59 others so honored is that last year he won the Nobel prize.

Since 1950 some 14 American scientists have won the Nobel prize before becoming members of the Academy. The perhaps natural assumption that the Academy must have erred in overlooking them is not necessarily correct. The Academy has a painstaking election process and may in any case know its own people better than does a far away committee in Stockholm, whose record is not without the occasional goof.

An additional facet in Schally's case, however, is that he shared the Nobel prize with Roger Guillemin, of the Salk Institute, who was elected to the Academy in 1974. The two were honored by the Nobel committee for the same discovery, isolating the peptide hormones of the brain, and though each may perhaps have contributed in somewhat different ways, the nature of their achievement was essentially very similar. The question invites itself as to why the Academy didn't see fit to elect both men at the same time, and indeed whether it would have elected Schally at all if he hadn't been recognized first by the Nobel committee.

The academy's elaborate election process is administered by Home Secretary David R. Goddard. Goddard says Schally's is by no means the first time in which election has come later than it should have done. "In this case it is accentuated by the fact that he got the Nobel prize first, but he should have been elected whether he had the prize or not."

Goddard says that the election machinery "is complex and tries desperately hard to be fair but is not free of error." He points out that the process is to some extent self-correcting in that people who don't get in the first year their names come up may well be elected in future years.

In Schally's case, however, the Academy evidently neglected to elect him in the four elections of 1974 through 1977. Officials decline to say if his name was already in the hopper for the 1978 elections before October 1977, when the Nobel prizes were announced.

One academy member, who believes strongly that Schally and Guillemin should have been elected at the same time, suggests that incidental differences, such as Schally's comparatively less eloquent style at the lecture podium, may have been a factor in preventing simultaneous election.

"I don't think the Academy is terribly happy about Schally's late election, but I hope he will be happy in the Academy," says Goddard.

World Arms Bill Now $1 Billion a Day

The United Nations Special Session on Disarmament, due to open at the end of May, does not have a great deal to be hopeful about. In 1977 the world spent almost one billion dollars a day on armaments, according to the most recent yearbook of the Stockholm International Peace Research Institute. NATO and Warsaw pact countries account for 70 percent, but the Third World share of military spending is steadily increasing.

The world's arsenal of nuclear weapons is now such that if even a significant fraction were used, "most of the cities in the Northern Hemisphere would be destroyed in a flash, and the bulk of their inhabitants would be killed instantly," says the Sipri domesday book.

New missiles being installed have accuracies of a few tens of meters, enabling them to destroy other missiles in their silos. Deployment of such first-strike weapons may encourage the other side to launch its own missiles at the earliest possible warning.

The convention prohibiting environmental forms of warfare has so far been signed by 43 nations, Sipri reports.

—Nicholas Wade

hairsbreadth of not happening at all. After 2 years of planning,† the Americans thought everything was fairly firm, but the Soviet penchant for making seemingly arbitrary and sudden changes in agreements is not to be underestimated. Five days before the meeting was to begin the National Academy of Sciences received a telegram from the Soviet Academy saying that two of the 12 agreed-on scientists would not be able to attend, and that due to "traffic problems on Aeroflot" half the remaining delegation would be arriving 2 days late. The NAS conceded the loss of the two scientists but decided it would have to take a hard line on the arrival time. In a flurry of telexes, messages sent through the American Embassy in Moscow, midnight phone calls to Lomov, and finally a telegram from NAS president Philip Handler to Soviet academy president A. P. Alexandrov, it was made clear that if all the Russians could not get to California by Monday things would probably have to be called off. So it was not until 8:30 a.m. on the day the Russians were scheduled to arrive, when a call came through from the American Embassy, that the future of the conference was assured.

The two scientists who did not make it were V. M. Rusalov of the psychology institute, who was said to be busy defending his doctoral thesis, and Y. N. Sokolov, chairman of Moscow State University's Department of Psychology, who is very highly regarded in this country and whose presence was specifically requested. The Soviets said he could not come because he had not gotten his papers (to leave the country) together in time. The Americans put such an emphasis on Sokolov's desirability that some of the rest of the delegation reportedly were offended and even considered not coming at all. Academy officials later took great pains to explain that they wanted to be sure participation in the joint conferences could be extended to scientists not affiliated with the Soviet Academy.

Whether the NAS can get funding for the rest of the conferences (the National Science Foundation provided most of the support for this one) will depend on final assessments of the Irvine meeting and the next one, on mathematical psychology, to be held in Russia at the end of the year. Psychobiology and math are said to be the Russians' strongest suits; many Americans are dubious about whether the quality of the interchange can be maintained in the later four topics. This month, however, it seemed that a tiny piece of détente had been thawed out.—CONSTANCE HOLDEN

†The actual agreement for the series of symposia was made between the NAS Assembly of Behavioral and Social Sciences and the Institute of Psychology. Protocols were signed the summer of 1976 when a contingent of American psychologists went to Moscow for detailed explorations of areas of mutual interest. They came up with a plan for six symposia, three in each country on psychobiology, mathematical models, auditory psychophysics, psychophysiological aspects of individual differences, mechanisms of eye movement and vision, and "human performance under stress conditions."

Results of NAS Election

The following 75 people, 60 Americans and 15 foreign scientists, were elected to the National Academy of Sciences last month.

Julius Adler, University of Wisconsin, Madison; **Paul B. Barton**, U.S. Geological Survey, Reston, Virginia; **Gerald E. Brown**, State University of New York, Stony Brook; **E. Margaret Burbidge**, University of California at San Diego; **Hampton L. Carson**, University of Hawaii; **Alonzo Church**, University of California at Los Angeles; **Morrel H. Cohen**, University of Chicago.

Sidney Darlington, University of New Hampshire; **David R. Davies**, National Institute of Arthritis, Metabolism, and Digestive Diseases, National Institutes of Health; **Hans G. Dehmelt**, University of Washington, Seattle; **Ralph I. Dorfman**, Syntex Corporation; **Emanuel Epstein**, University of California at Davis; **Robert M. Fano**, Massachusetts Institute of Technology; **Kent V. Flannery**, University of Michigan, Ann Arbor; **Jordi Folch-Pi**, Harvard Medical School; **Morris E. Friedkin**, University of California at San Diego.

David M. Green, Harvard University; **Howard Green**, Massachusetts Institute of Technology; **Paul Greengard**, Yale University; **Mary R. Haas**, University of California at Berkeley; **Susumu Hagiwara**, University of California at Los Angeles; **Robert N. Hall**, General Electric Company; **John E. Halver**, College of Fisheries, University of Washington, Seattle; **Charles Heidelberger**, University of California Comprehensive Cancer Center; **John Imbrie**, Brown University; **Dale Jorgenson**, Harvard University.

Leo P. Kadanoff, Brown University; **Isabella L. Karle**, U.S. Naval Research Laboratory, Washington, D.C.; **Harold H. Kelley**, University of California at Los Angeles; **Bertram Kostant**, Massachusetts Institute of Technology; **Lester Krampitz**, Case Western Reserve University; **Erich L. Lehmann**, University of California at Berkeley; **Lionel W. McKenzie**, University of Rochester; **Elizabeth C. Miller**, University of Wisconsin School of Medicine, Madison; **James A. Miller**, University of Wisconsin School of Medicine, Madison; **Oscar L. Miller, Jr.**, University of Virginia.

Ernest Nagel, Columbia University; **Masayasu Nomura**, University of Wisconsin, Madison; **Lloyd J. Old**, Sloan-Kettering Institute for Cancer Research; **Mary J. Osborn**, University of Connecticut Health Center, Farmington; **Daniel G. Quillen**, Massachusetts Institute of Technology; **Richard J. Reed**, University of Washington, Seattle; **Peter M. Rentzepis**, Bell Laboratories; **F. Sherwood Rowland**, University of California at Irvine; **Harry Rubin**, University of California at Berkeley.

Andrew V. Schally, Veterans Administration Hospital, New Orleans, Louisiana; **David A. Shirley**, Lawrence Berkeley Laboratory, University of California at Berkeley; **Walther Stoeckenius**, University of California at San Francisco; **Paul K. Stumpf**, University of California at Davis; **Patrick Suppes**, Stanford University; **Ivan E. Sutherland**, California Institute of Technology; **Lynn R. Sykes**, Columbia University; **Owsei Temkin**, The Johns Hopkins University; **Ping King Tien**, Bell Laboratories; **Peter H. von Hippel**, University of Oregon.

Paul E. Waggoner, Connecticut Agricultural Experiment Station, New Haven, Connecticut; **George M. Whitesides**, Massachusetts Institute of Technology; **Shmuel Winograd**, IBM Corporation; **Lincoln Wolfenstein**, Carnegie-Mellon University; **Carl I. Wunsch**, Massachusetts Institute of Technology.

The new foreign associates are:

Michael F. Atiyah, Oxford University, England; **Ricardo Bressani**, Institute of Nutrition of Central America and Panama, Guatemala; **Luigi L. Cavalli-Sforza** (Italy), Stanford University, California; **John W. Cornforth**, University of Sussex, England.

James H. S. Gear, South African Institute for Medical Research, Republic of South Africa; **Johannes Geiss**, University of Berne, Switzerland; **Robert A. Hinde**, University of Cambridge, England; **Hugh E. Huxley**, Medical Research Council Laboratory of Molecular Biology, England.

Helge Larsen, Danish National Museum, Denmark; **Rudolph L. Mossbauer**, Technical University, Munich, Federal Republic of Germany; **Joseph Needham**, University of Cambridge, England; **Giuseppe Occhialini**, University of Milan, Italy; **John C. Polanyi**, University of Toronto, Canada; **Maarten Schmidt** (Netherlands), California Institute of Technology, Pasadena; **Rudolph Trümpy**, Eidgenössische Technische Hochschule, Zurich, Switzerland.

Erratum. In the report by T. P. Schilb of the 14 April issue, pp. 208–209, the last sentence in the text should read: "The data presented here show that workers housing turtles at different temperatures but doing otherwise identical experiments would be expected to get different results, and that the finding that the luminal P_{CO_2} is greater than the serosal P_{CO_2} should not be interpreted as evidence for H^+ secretion."

Erratum. In the review of *Lymphocyte Differentiation, Recognition and Regulation*, which appeared on p. 526 of the 3 February 1978 issue (vol. 199), the price given for the book is incorrect. The correct price is $42.

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