INTERNATIONAL SOCIETY FOR NEUROETHOLOGY

Newsletter
March 1998

International Society for Neuroethology **c/o Panacea Associates** **744 Duparc Circle** **Tallahassee FL 32312 USA**	**phone/fax: +001 (850) 894-3480** **E-mail: ISN@panassoc.com** **Website: www.neurobio.arizona.edu/isn/**

LETTER FROM THE PRESIDENT

With the arrival of a new year, an important transition began for the ISN. After many months of negotiations and planning, the ISN began a partnership with professional society managers, Panacea Associates (PA) of Tallahassee, Florida. PA is a small enterprise operated by Susan Lampman and Patricia Meredith, both of whom have had extensive experience in conference services, management of professional organizations, etc. PA has been managing the Association for Chemoreception Sciences (AChemS) for many years, and in that capacity they have earned a fine reputation for efficient and attentive service tailored to the needs of the organization. For a trial period of two years, most of the routine management operations of the ISN will be handled by PA.

These services will be phased in over the next few months. For example, please notice that the membership form published in every issue of this Newsletter has changed. All completed membership forms, with payment as appropriate, should be mailed to the ISN at its new business address: *International Society for Neuroethology, c/o Panacea Associates, 744 Duparc Circle, Tallahassee FL 32312, USA*

The ISN's new business phone/fax number is +001 (850) 894-3480, and its new business E-mail address is ISN@panassoc.com. The URL of the ISN's Website will remain unchanged: www.neurobio.arizona.edu/isn/

I hope you have discovered by now that a searchable version of the ISN's Membership Directory is available at the Website. It is updated frequently. Please check your entry and notify Panacea Associates if any of your information needs to be updated. Later in 1998, PA will produce a print version of the Directory, which will be sent to all members (but of course it will be as up-to-date as the directory on our Website for only a few days!).

I conclude with a hearty "welcome" to Panacea Associates and my own personal wish that this is the beginning of a long and mutually rewarding association between PA and the ISN!

John Hildebrand

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NOMINATION OF CANDIDATES FOR THE 1998 ELECTION

In the fall of 1998, shortly after the International Congress of Neuroethology in La Jolla, CA, the ISN will conduct its triennial election of officers and Councilors by postal balloting. As before, the plan is to assemble the slate of candidates prior to the Congress so that the ISN membership will be informed about the election well in advance of the balloting. Thus the Nominating Committee must complete the task of assembling the slate of nominees by June, 1998.

To assist the Committee, all members of the ISN are hereby invited to suggest potential nominees for the positions of President-Elect, Secretary, Treasurer, and members of Council. Nominees must be members in good standing in any membership category except Student Members. Please submit suggestions to the ISN President, John Hildebrand, via E-mail addressed to: jgh@neurobio.arizona.edu.

SEE YOU IN LA JOLLA (SAN DIEGO) 23-28 AUGUST, 1998

The Second Announcement of our 5th International Congress has been mailed to ISN members and others who previously indicated an interest in the Congress. This mailing includes registration and abstract forms. Please register promptly and make your travel plans! The Congress Committee has put together a very attractive program, covering many aspects of the wide field of neuroethology. In addition to plenary lectures by prominent colleagues, there will be many symposia devoted to new exciting trends in neuroethology, including extensions into higher brain functions of humans. The conference is a great opportunity to meet old and new friends, discuss the latest scientific achievements and developments, and learn about the whole range of neuroethological systems and their importance for understanding behavior. In particular, we want to welcome the young investigators who will lead us into the future of our field. Some of them, the winners of the Young Investigator Awards (see related article below), will give featured talks about their work, and you will hear about some excellent new approaches in our field. There are also very attractive events scheduled for the evenings, for example excursions to the Aquarium and the famous Sea World.

The deadline for abstract submission is 15 April 1998, and pre-registration (with discounted registration fee) ends 15 July 1998. Although the early-registration fee (USD 325.00 for members or USD 250.00 for students and all members from developing or former Eastern-bloc countries) seems high, the costs for housing including breakfast and lunch will be very low.

Don't hesitate! Plan to come to La Jolla and enjoy a week of stimulation and fun among your scientific friends.

If you have any questions, please send E-mail to: <asorgenfrey@ucsd.edu> or <wkristan@ucsd.edu>.

THIRD CALL FOR PROPOSALS FOR THE 6TH INTERNATIONAL CONGRESS OF

NEUROETHOLOGY IN 2001

As we prepare for the 5th International Congress of Neuroethology in San Diego, California, it is not too early to begin to think about the 6th International Congress, to be held in 2001. As before, the officers of the ISN wish to receive and review proposals for the site and hosting of the 2001 Congress. Suitable proposals will be presented to the ISN members attending the Business Meeting at the 1998 Congress, and one proposal will be selected by balloting at that meeting.

The first five International Congresses will have been held in Tokyo (1987), Berlin (1989), Montreal (1992), Cambridge (1995), and San Diego (1998). In order to ensure that the Congress venue moves among the parts of the world with significant numbers of ISN members, proposals from prospective hosts in Japan and Europe would be especially welcome.

Written proposals will be due by 1 July 1998 and should be sent to the ISN President: Dr. John G. Hildebrand, ARL Division of Neurobiology, Univ. of Arizona, 1040 E. 4th St., PO Box 210077, Tucson AZ 85721-0077, USA. Requests for additional information may also be directed to him via E-mail.

RESEARCH GROUP REPORT

Bee-Havior

Dr. Randolf Menzel
Free University, Berlin, Germany

We probably all agree that the most exciting questions in neuroscience arise from the observation of animal behavior under natural conditions. For me, the fascination began when Martin Lindauer introduced me to training experiments with bees in the late 1960s. How could these insects be so consistent in choosing the cues associated with sucrose reward? How could they could memorize such a long chain of events and cues, which reliably led them back and forth between the food source and their colony? How could they learn from one another when they communicated about successful foraging trips? I pursued bees in blooming meadows and recorded their choice behavior when alighting on flowers, just to convince myself that what I had seen in training experiments with jars of sucrose solution was indeed their natural behavior. And it was. The little brain connected to its multiple sensory organs must do a marvelous job, but how does it do it? My approach toward this question followed the traditional top-down method. First behavioral analysis, then neuroanatomical studies and intervention experiments, then electrophysiology followed by biochemistry, cell- and developmental biology. I tried to keep each level of analyses aimed toward a mutually interacting research strategy for the benefit of all levels of the analysis. At the present time, my research group is tackling the questions of perception (visual and olfactory), learning and memory in honeybees at the behavioral and ecological level, as well as at the neurophysiological and the cellular levels, with approximately equal emphasis on each area.

In the field, we study navigation and choice strategy with this question in mind: Are the multiple associations made on search flights and foraging trips integrated into contextual and configural forms of memory? And, if so, how? Our hypothesis is that, as in other living things, the integrating factor is a rich representation of space within the coordinating system of the sun compass and distance measurements. If multiple feeding sites are learned, their reward properties are associated with their locations relative to landmarks and are chosen under optimization criteria (Uwe Greggers, Julianne Mauelshagen). A memory of sequences in which the spatial arrangements of landmarks are represented can be built: Bees learn a sequence of visits through a set of multiple feeding sites (Martin Giurfa, Daniela Kratzsch). Bees trained to two widely separated feeding sites are able to choose a novel flight route towards the hive from a previously unused release site between the two feeding sites. These and other experiments convince us that spatial memory in bees is more than the isolated chains of associations, and we are further exploiting this configural richness of spatial representation.

In our more recent studies of visual perception, we found that bees see and learn achromatic signals also and use these signals for the detection of visual cues from a distance (Martin Giurfa, Misha Vorobyev, Natalie Hempel de Ibarra). These new findings - - together with our detailed knowledge of color vision (Werner Backhaus, Lars Chittka, Misha Vorobyev, Robert Brandt) are compiled in an integrated model of visual

perception that can be effectively used to characterize and evaluate the shapes and color patterns of flowers. Such a model is extremely helpful in studying the evolutionary relationship between hymenopteran pollinators and flower signals (Andreas Gumbert, Jan Kunze). In this context, it is also important to know that the learning of visual cues goes beyond simple neural imaging devices and allows generalization, transfer and concept formation, as in the case of bilateral symmetry (Martin Giurfa).

In the laboratory we study bees' learning and memory using a paradigm developed in von Frisch's lab in the '40s and first applied to the question of learning by Kuwabara when he worked with von Frisch in the early '50s: the proboscis extension response (PER) conditioning. I became fascinated by this paradigm in the early '70s and used it (together with Thomas Masuhr, Jochen Erber and many others) to study the role of mushroom bodies and the antennal lobe in olfactory conditioning. A major breakthrough concerning the neural basis of associative learning in bees was achieved by two seminal studies in the '90s: Julianne Mauelshagen's first records of an identified mushroom-body extrinsic neuron (the Pe1) and Martin Hammer's discovery of the VUMmx1, a ventral, unpaired, median neuron of the maxillary neuromere that implements the reinforcing property of the unconditioned stimulus (sucrose) and also learns about the conditional stimulus (odor). Martin's work on the reinforcing pathway is being continued by Rainer Malaka, Frank Hellstern, Johannes Jander, Dirk Mueller and Ulrike Schroeter. VUMmx1 's anatomical and physiological properties are used to model the neural substrate of associative learning. Julianne's work on the plastic properties of the Pe1 neuron inspired new electrophysiological studies on the role of various neurons in olfactory learning. Regina Abel and Bernd Gruenewald have added new insight into the range of neural correlates of associative and non-associative forms of learning. On the behavioral level, fundamental questions of associative learning and memory formation can be studied with the PER paradigm (Frank Hellstern, Bertram Gerber, Dirk Mueller). These studies show that theories of associative learning can be critically tested, because PER conditioning relies not only on elementary forms of associations but also on contextual and configural forms.

The neural substrates of olfactory coding and learning in the bee brain are also accessible by imaging techniques. Odor-induced activity patterns can be imaged in the antennal lobe and mushroom bodies using Ca 2+sensitive dyes and can be used to study the spatial components of the olfactory code and its adaptive change as the consequence of learning (Jasdan Joerges, Armin Kuettner, Giovanni Galizia, Till Faber). These studies have recently become particularly exciting, because whole-animal preparations similar to the PER paradigm can be used, allowing for extended periods of testing (several hours) and conditioning.

The cellular signaling cascades involved in olfactory learning are studied with biochemical methods at the level of the antennal lobe (Uli Mueller, Lore Gruenbaum, Christina Fritz) and with patch clamp electrophysiology on cultured mushroom-body neurons (Bernd Gruenewald, Corinna Pelz, Frank Goldberg). Proteinkinase A turns out to be involved during the process of learning, NO synthase provides a signal essential for a long-lasting memory phase after multiple learning trials, and Protein-Kinase C in two constitutively activated forms appears as the substrate of two sequential and independent forms of long-lasting memory. The initial characterization of voltage -sensitive whole-cell currents of mushroom bodies by Sabine Schaefer and Hendrik Rosenboom has been substantially extended by analyses of current kinetics. In addition, the modulation of whole-cell currents by biogenic amines, among other neuromodulators, is being investigated. The cellular cascades are also being studied (Bernd Gruenewald, Corinna Pelz).

Developmental studies (Dagmar Malun, Sabine Schaefer) focus on the ontogeny of the mushroom body. Understanding of the multiple factors at work in neuronal and non-neuronal elements that participate in mushroom bodies may reveal the mechanisms underlying the development of this interesting structure as well as provide insight into signal processing in the mushroom bodies. As one of the consequences of these studies, interference with hydroxyurea can be applied at particular times in development to raise bees with deleted mushroom bodies. These insects are then used in behavioral experiments to study the role of mushroom bodies in particular forms of learning (Bertram Gerber, Martin Giurfa).

In introducing the group to our colleagues in the field of neuroethology, I want to add a personal note about two tragic losses our group has suffered within one year. First, Julianne Mauelshagen was killed in a climbing accident in the fall of 1996. Then, in September 1997, Martin Hammer was killed in a car accident. With his inventiveness and careful analyses, Martin contributed significantly to our research, giving our work a new direction with his VUM-neuron discovery, which enabled us for the first time to check concepts of learning theory for their neuronal implementation. He worked on that discovery tirelessly and with enormous

enthusiasm. Both Julianne and Martin were valued members of our group and will be missed personally as well as professionally.

Our research group is part of the Biology School at the Freie Universitaet Berlin. This means that the group is highly involved in educational programs within the structure of a university institute, although there are no permanent positions for academic staff and financial support from the university is rather small. We have been fortunate in recruiting support from outside research agencies over the years, in particular an award form the Leibniz program of the Deutsche Forschungsgemeinschaft (1991-1996).

Visitors from other research labs are frequent, including those from abroad. Anyone interested in our work is welcome to contact me or others at the lab. (web page:http://www.neuro.biologie.fu-berlin.de, e-mail: menzel@zedat.fu-berlin.de)

AUTOBIOGRAPHICAL SKETCHES

NOCTILUCA, DRAGONFLIES AND CRAYFISH

Mituhiko Hisada
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In early September of 1970, I found myself attending a symposium on animal orientation and navigation held at a NASA station on the island of Wallops, VA. I gave a paper about the sun compass orientation of dragonflies. Looking back from now, the symposium seems to have foretold the coming of neuroethology. The participants, including Kenneth Roeder, C. A. G. Wiersma and Martin Lindauer, came from a wide variety of disciplines such as animal navigation, communication, sensory physiology and neurophysiology.

One night during the symposium, we gathered to watch the tracking of migrating birds by radar. We could see eerie phosphorescent blips moving across the screen with a steady waxing and waning rhythm. We were told that they were reflections from individual large migrating birds heading south miles off the Atlantic coast, and the flickering was caused by their flapping win s. Flocks of passerine birds appeared like puffs of cloud. This was my first viewing of the so-called angels known to radar operators since World War II. Adding to my amazement, I was told that in collaboration with other radar stations along the Atlantic coast, they had managed to trace the same flock from Maine to the Caribbean islands.

A boat cruise to Chincoteague Island was also a delight for everyone, particularly for the bird people. There was Ted Bullock chatting with us on the sun lit deck. Nobuo Suga and I stayed in the same room of the dormitory and we strolled out at night to listen to the high pitched shrill of the tree crickets.

Around the time of this symposium, student strife was ubiquitous in Japanese universities. We were facing imminent takeover of our building by a violent sect. Once invaded, you could expect to face the loss of your instruments, and worst yet, of records and data from your laboratory. So we had to evacuate the essentials from the laboratory and keep them somewhere. Thus, there was no chance to continue the experiment I was undertaking.

In the late summer of 1969, while watching the commotion going on right under my window, I suddenly noticed a large number of red dragonflies, *Sympetrum* sp., flying past, almost all of them, in one direction. This brought me back to my high school days in a chemical plant where I was mobilized to work during World War II. Watching a swarm of dragonflies flying around and perching on the power line was my favorite pastime there. So I began this again, but this time equipped myself with a compass and a notepad.

Measuring the orientation of perched dragonflies in a small botanical garden next to the science building, while loudspeakers blared out the protesters' peculiar chants, was psychologically so removed from the world. I secretly enjoyed my isolation from the tumultuous life of those days, yet I felt slightly guilty thinking of my colleagues confined in the building to defend it.

Due probably to this feeling of guilt, I had not dared to tell anyone outside my laboratory what I was doing in

the secluded garden. So it was quite a surprise to receive a letter of invitation on NASA letterhead asking me to present this topic, when I was only halfway along with basic data collection. I truly wondered how they discovered my secret. I am still thankful to whoever gave me the unexpected chance to attend the symposium.

Back to the wartime chemical plant: I was fortunate enough to be first stationed in the power plant which supplies DC current for production of chlorine gas, and then in the planning section where I helped to draw up plans for an enormous distillation tower. These experiences were naturally quite influential for a 14-year old boy and made me interested in science and technology above all. Gradually I found I was more comfortable with biological issues than those of other fields. This led me to Tokyo University, where I majored in zoology.

I spent my last year of university in a physiology laboratory then chaired by Haruo Kinoshita, stimulating Paramecia with electric current, and measuring their cortex contractility with primitive handmade setups. Then for a little more than two years beginning on 1952, I was a research associate at the Misaki Marine Biological Station.

Influenced by the historic Hodgkin-Huxley paper, I took up the study of *Noctiluca*, a bioluminescent dinoflagellate, in hopes of recording electrical activity related either to bioluminescence or the movement of its flagellum. Armed only with a mercury galvanometer of my own making, I spent a few weeks struggling to catch some sign of electrical activity. Soon I found the mercury galvanometer, however good it was, would be no match for the frequency response and sensitivity necessary to record the activity.

Then one day, Yasuji Katsuki visited the station with his colleagues, one of whom was Susumu Hagiwara, to explore the fish fauna around the station looking for suitable material for their study. Knowing Katsuki-san had brought back some of the most up-to-date electronic instruments from US, I asked him to give me a chance to record the membrane potential of this dinoflagellate. The difference between my primitive setup and his sophisticated equipment was astounding; after a few days of trial I already had good evidence of fast electrical activity related to flagellum movement.

In the summer of 1954, I moved to Hokkaido University where I found nothing in the way of electronic instruments, even the vacuum tube equipment of the day. I began the struggle to build my own oscilloscope and microelectrode rode amplifier. US military junk on sale at stall shops in Akihabara, Tokyo were the only source for vacuum tubes, including cathode-ray tubes. So I left Tokyo on the night train to Sapporo, carrying a backpack full of electronics. The 26-hour ride was at the time the only way to get to Hokkaido.

Many hours I spent building instruments, oscilloscope and amplifier, from scratch. No one could teach me how to build a stable DC amplifier with a gain of 10,000. I had to build it by trial and error, with only the meager knowledge of electronics I had then. Since then, I have often been thankful for this and for my wartime experiences; because of this, I have never been afraid to try to build electronic circuits and other instruments when the need arises for some new venture in my research.

For some years I analyzed frog neuromuscular junctions with those handmade instruments. Meanwhile I had abandoned my *Noctiluca* quest because there were no *Noctiluca* available in this northern island, though I knew some important issues left unsolved. One of these issues, electrical activity associated with bioluminescence, was addressed later by Roger Eckert and resolved into some beautiful findings.

Then gradually, I became interested in behavior and neurobiology of crayfish. In particular I was attracted to the mechanism of equilibrium response of this animal. Starting from the sensory coding mechanism of statocysts, I followed the neuronal circuit subservient to the equilibrium response down to the tails. Thus I became acquainted with Hermann Schoene and his colleagues both through their publications and in person.

In 1976, I took charge of my own laboratory and extended my studies of the crayfish central nervous system. In the early '80s, my laboratory was filled with young researchers not only from all over Japan but also from foreign countries. I could hear a variety of dialects and foreign languages, as well as the technical terms from other disciplines. Tateo Shimozawa with his engineering school background, Masakazu Takahata, and Toshiki Nagayama, all contributed their unique perspectives.

Our interests gradually focused on the neuronal mechanism by which the crayfish chooses one behavior among the possible alternatives. And so we encountered non-spiking neurons. I still clearly remember June 9,

1980 as the day when Takahata succeeded on recording and staining a non-spiking neuron. After that day, the study of crayfish neurons, particularly interneurons has continued with increasing intensity. Meanwhile, in 1993, the laboratory was reorganized and renamed the Laboratory of Animal Behavior and Intelligence in the Graduate School of Science, Hokkaido University. It now has three professorial chairs including Takahata. Shimozawa, now a professor, returned to the Institute for Electronic Science of Hokkaido University a while ago, where he has built a laboratory based on his own philosophy.

Coinciding with this expansion, I retired from the Hokkaido University and moved to my present position at the Science University of Tokyo. My job here is teaching biology for freshmen and at the same time administering this branch school, and thus scarcely no research.

I believe that any laboratory is destined to go through a kind of life cycle. Starting from a phase of exploration and development, it flourishes. But inevitably the day will come when it stagnates, and finally dies away . Indeed, 5 years after my retirement, under the guidance of new professors, the laboratory has expanded and is truly flourishing.

PSYCHIATRY AND MONKEY NEUROETHOLOGY

Prof. Dr. Dr.h.c. Detlev W. Ploog
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Munich, Germany

I am pleased that an outsider in neuroethology like me has been asked to write an autobiographical sketch for our newsletter.

I began to study medicine In 1939, but was soon drafted and ordered to German-occupied France and into warfare against the Soviet Union. Despite the war I was able to complete my studies in March 1945 at the University of Marburg, the place where Luther and Calvin disputed about the iota. I did my medical thesis--an experimental study on thought processes--with Klaus Conrad, a professor of neurology and psychiatry and head of a unit for brain-injured soldiers, especially aphasics. This was the beginning of my life-long fascination with communication processes and their disorders. One of the outcomes was an experimental paper on the time course of memory traces in brain atrophy and its relation to the unconscious. In the winter of 1948/49, during my training in neurology and psychiatry, I was sent to the Institute of Psychology at the University of Freiburg to study diagnostic testing. It was there that the turning point in my thinking occurred, and ethology came in. Konrad Lorenz and Erich von Holst jointly held a one-week intensive course in ethology (Lorenz) and the brain mechanisms underlying innate species-specific behavior (von Holst) such as swimming, flying, fleeing, attacking and ritualized behaviors of intraspecific communication (what Tinbergen called social signaling). I was very stimulated by this concept, went regularly to the nearby zoological institute to the seminars of Otto Koehler, who was then, in German circles, thought of as the father of ethology, and regretted not to be a zoologist.

Back in Marburg I tried to relate ethological concepts to psychiatry and psychopathology. My first presentation at a congress was on sleep and its relation to the major (endogenous) psychoses. I considered sleep to be an instinct whose disturbance is indicative of a cerebral mechanism that is also involved in psychotic behavior (1953). Afterwards there was a heated debate in which Richard Jung, the foremost neurophysiologist in Germany, attacked my concept. Nevertheless, he later asked me to write a comprehensive chapter on ethology and psychiatry for "Psychiatrie der Gegenwart," which became a 150-page contribution, published in 1964. One of the main thrusts was the bridging of concepts between comparative physiological psychology and ethology. Much of the chapter was concerned with the introduction of evolutionary concepts into psychiatry.

A further turning point in my life occurred in 1957 in Richard Jung's laboratory in Freiburg. Paul MacLean was visiting and at a large dinner party I happened to sit next to him. We conversed intensely about our mutual interests. Later that year MacLean invited me to be a Visiting Scientist in his laboratory at the National Institute of Mental Health (NIMH) in Bethesda. I was the happiest of men. In September 1958 I arrived in New York harbor with my wife, three small children, and a Volkswagen. A navigator got us from Manhattan

to Bethesda, MD, where we were shown to a house that had been rented for us and equipped with everything a family would need for the first few days. The next morning, a Sunday, a couple of fellows knocked at our door and said they were friends of Paul's and wanted to help us. The following morning, the first person I was introduced to was the Research Director of NIMH, Robert B. Livingston, who turned out to be one of the two! I was stunned, and we all had a good laugh. Nothing like that could have happened in the West Germany of those days. It impressed me so deeply that this reception of a foreign visitor became a model for my later years as head of a large research institute.

MacLean's approach to discovering the brain structures and functions of sexual behavior was straightforward. Each site in the squirrel monkey's brain from which penile erection could be elicited by electrical stimulation was a candidate for being part of the postulated brain system for sexual behavior. After two years most of the mapping was done, and the results were published in 1962.

Now what was the function of penile erection in the squirrel monkey? Was it used only for sex and reproduction, or was there more to it than that? I found a translucent cage that was well-suited for observing a group of six squirrel monkeys. A behavioral catalog was set up and a series of sociometric studies on two differently composed groups was conducted. Naturally, penile erection was used in copulatory behavior, but this was a comparatively rare event. In almost all cases penile erection occurred in conjunction with a rather conspicuous motor pattern: One thigh was bent, with supinated foot and spread big toe. No doubt this complex behavior pattern served as a social signal that was instrumental in establishing the hierarchical order in a group and each animal's individual role. Later on, in Munich, motion pictures of a newborn squirrel monkey showed the animal exhibiting the thigh-bending-big toe-spreading behavior from its mother's back towards an obtrusive group member on the day of birth (1963). This was further evidence that genital display is a ritualized behavior pattern evolutionally derived from sexual behavior but used as a powerful communicative social signal.

In 1962 I was able to establish the first laboratory for experimental studies on primate behavior and brain functions in Germany, at the Max Planck Institute for Psychiatry in Munich. There, in further brain stimulation studies, various types of vocalizations were elicited and animals next door responded to them. It became clear that vocalizations serve as social signals and are produced by specific brain structures. The first catalog of the squirrel monkey's vocal repertoire was worked out (1966). Among the great variety of calls, two warning calls were experimentally validated, one for aerial predators and one for terrestrial predators. Even newborn Caspar Hausers make this distinction (1973).

Concurrently the cerebral representation of vocal behavior was investigated (1970) and then further explored and refined by several co-workers for many years. Primates, including humans, share the phylogenetically old vocal cerebral system, which is hierarchically organized and leads from the anterior cingulate gyrus in midline structures down to the reticular formation, feeding over some synapses into the nucleus ambiguus, which innervates the vocal cords. In humans, there is in addition a phylogenetically younger vocal system, running along the pyramidal motor pathway from the cortical laryngeal and oro-facial representation in the primary motor cortex to the respective motoneurons in the medulla oblongata. This direct connection serves as the neuronal basis for the voluntary control of the vocal folds and the articulators. This control appears to be a prerequisite for the evolution of speech. The monkey can use its whole vocal repertoire without the cortical primary motor system, but is unable to fractionate or segment its utterances into phoneme-like units. My hypothesis is that the last step in the evolution of the phonatory system is the outgrowing of the fine fiber portion of the pyramidal tract that serves the direct and fast innervation of the speech apparatus. The (universal) phonemes in speech are species-typical articulatory gestures (1988).

In 1966, the research hospital of the Max Planck Institute for Psychiatry was opened. As its head I had the opportunity to put psychiatry, neurology and child neuropsychiatry, together with a department of psychology, under one roof. Baby talk and motherese was one of the major research topics in the children's department, along with speech disorders in preschool and school children. A neuropsychological research unit was concerned with phonatory and articulatory disorders in patients with neurological problems, and other groups investigated a whole spectrum of nonverbal communicative behavior patterns in patients with psychiatric disorders, including Parkinson's disease. The idea behind these and other programs was that a large proportion of mental and emotional disorders are disorders of the homo-typical communication system, which can become vulnerable in any of its different parts. I hoped that an evolutionary approach would help us to explain some of the mysteries in psychopathology.

In closing this brief sketch I'd like to mention someone whose visit to my office turned out to be a life event--as psychiatrists like to call events that are determining factors for the further course of a person's life. One day in 1963 a visitor named Schmidt announced his visit over the phone. I had no idea who he was. It was Francis O. Schmitt, who had just created the Neurosciences Research Program at M.I.T. We talked for several hours, during which time I became very excited about his plans. Early in 1964 I was invited to give a talk. Thereafter the "Associates," the multidisciplinary advisory board of the NRP, voted for me and I too became an Associate. There were two meetings a year for reports, the exchange of ideas, and planning of work sessions. The two work sessions I held in 1967 and 1970 on "Primate Communication" and "Are Apes Capable of Language?" brought me together with the scientists in the forefront of the field. The Associates and their ideas were immensely important to me and the work in my institute. My deepest respect for and gratitude to the late Frank Schmitt.

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THE INAUGURAL SCIENTIFIC MEETING OF THE JULIA B. PLATT CLUB

Steven J. Zottoli and Ernst-August Seyfarth

Julia B. Platt came to Pacific Grove at the turn of the century. She was trained as a scientist but was unable to secure a teaching job. Instead she became a civic leader with numerous accomplishments including the creation of a Town Manager form of government, first woman mayor of Pacific Grove and successful legal action for public access to the waterfront. Even though her energies were focused on civic issues, she did not lose faith or interest in her scientific career, as judged by her statement to Harold Heath, a comparative anatomist and embryologist at the Hopkins Marine Station, that "I hope that Science will go over my findings; for I know that I am right". Her statement continues to be realized both by the inspiration of her work for scientists who have followed and most recently in the naming of a scientific club in her honor.

Julia Platt's scientific studies covered a wide variety of topics including, axial segmentation of the chick, development of cranial nerves, eye muscles and their segmental origin in spiny dogfish (*Squalus*), morphogenesis of neural crest and epidermal placodes in the head of the mudpuppy (*Necturus*), studies on the nervous system, including the development of the peripheral nervous system in Necturus, geotaxis of Paramecium and an investigation of nervous fibers bridging the central nervous system and chorda in *Branchiostoma* (= *Amphioxus*).

Julia B. Platt published 12 papers in a ten year period between 1889 and 1899. Two of the 12 papers were preliminary notes and 10 were full research papers. One way to judge the impact of her scientific contributions is to determine the number of times her work has been cited. An author search using Science Citation Index indicates that her work was cited 59 times between 1974-1997. Twenty one authors have cited her work between 1994-1997 and 8 of her ten full papers were cited since1987. This is a remarkable accomplishment given the diversity of her research topics and the fact that the work was completed almost one hundred years ago.

The inaugural meeting of a scientific club named in honor of Julia Platt (Julia B. Platt Club) occurred on January 2, 1998 in Boston. The meeting was organized by William Bemis, Professor of Zoology at the University of Massachusetts, Amherst, as "an interdisciplinary forum for evolutionary morphology and development." A series of more than 20 talks was presented on the origin of evolutionary innovations, the relation of these innovations to phylogeny (the history of successive biological populations) and how ontogeny

(the development or life history of an individual) relates to phylogeny. For example, Linda Holland from the University of California, San Diego presented a talk entitled, "The evolution of vertebrate segmentation: some ideas from *Amphioxus*", a topic Julia would have been particularly interested in.

Naming a club in Julia Platt's honor is a credit to her scientific contributions and to her pioneering role in opening opportunities for other women who followed her. The organizers believe that this may be the first organization in the biological sciences named in honor of a woman. More information about future meetings of the club can be obtained by contacting either William Bemis, Department of Biology, University of Massachusetts, Amherst, MA 01003 (wbemis@marlin.bio.umass.edu) or Steven Zottoli, Department of Biology, Williams College, Williamstown, MA 01267 (Steven.J.Zottoli@Williams.edu).

Young Investigator Awards

The ISN's ad hoc selection committee for the Young Investigator Awards (Drs. Avis Cohen, Alan Gelperin, Catherine Rankin, and Harald Wolf) recently completed its deliberations and announced this year's awardees. This competition attracted twenty strong applications, so that choosing winners was no easy task. In view of the strong field of candidates, the selection committee recommended that four awards be presented this year, and the officers and Councilors of the ISN voted in favor of that proposal. The winners will present talks in a special session at the upcoming Fifth International Congress of Neuroethology.

The 1998 Young Investigator Awardees are (in alphabetical order):

- Dr. Beatrice Casasnovas (Lab. of Neuromuscular Physiology, Calais, France)
- Dr. Kenneth C. Catania (Dept. of Psychology, Vanderbilt Univ., Nashville, USA)
- Dr. John E. Lewis (Dept. of Cellular & Molecular Medicine, Univ. of Ottawa, Canada)
- Dr. G. Troy Smith (Dept. of Zoology, Univ. of Texas, Austin, USA)

In addition, there were four runners-up (again, in alphabetical order):

- Dr. Matthew A. Friedman (Dept. of Neurobiology, Harvard Medical School, Boston, USA)
- Dr. Katalin M. Gothard (ARL Div. of Neural Systems, Memory and Aging, Univ. of Arizona, Tucson, USA)
- Dr. Holger Krapp (Faculty of Biology - Neurobiology, Univ. of Bielefeld, Germany)
- Dr. Robert A. Wyttenbach (Sec. of Neurobiology & Behavior, Cornell Univ., Ithaca, USA)

The officers and Councillors of the ISN congratulate these outstanding young neuroethologists and their fellow candidates, all of whom presented admirable records of achievement. The number and quality of candidates in this competition testifies well to the current strength and future promise of our field of science!

John Hildebrand

MEMBERSHIP IN ISN

A form for membership and to change member profile is located on the Membership Information page of this website. Please pass this address along to someone you know who might like to join ISN.

MATERIAL FOR FUTURE NEWSLETTERS

Send news, job advertisements, meeting announcements and other related information for the next newsletter (to be published in early March) to Arthur Popper at: popper@zool.umd.edu. All material should be sent via E-mail. Advertisements for jobs and graduate/postdoctoral positions should be no more than 200 words. Suggestions for *feature articles*, including autobiographical sketches, research group reports, and Neuroethological Viewpoints, should also be sent to Art Popper. However, please do not submit full articles of this type without a response from the Editorial Board. Feature articles should be no more than 450 words long.

COURSES, MEETINGS, WORKSHOPS

Friday Harbor Laboratories, NEUROBIOLOGY COURSE, May 4 - June 6, 1998, for senior undergraduate and graduate level students. An intensive course in neurobiology, and behavior with emphasis on channel concepts/techniques, intracellular electrophysiology and in vitro culture studies of neural circuitry, actions of neurons, peptides, important for development and behavior of diverse animals. Laboratory training will focus on manipulations of RNA, genes, in vitro neuron dissection and culture, neuron-level immunofluorescence techniques, voltage and patch clamp, and neuronal circuitry.

The course involves daily lectures, extensive laboratory experience 10+hours/day), weekly research projects. Intertidal and shipboard field trips will introduce participants to the rich and diverse fauna of the Pacific Northwest region. Enrollment limited to 12.

Faculty: Naweed Syed, University of Calgary; Winsor Watson III, University of New Hampshire; A.O. Dennis Willows, University of Washington; Andrea Yool, University of Arizona, and other guest faculty.

Financial aid to qualified students will be possible from grants provided by the Grass Foundation and the University of Washington. Applications will be accepted until the course is full. For information see www.fhl.washington.edu, or willows@fhl.washington.edu, or the Director, Friday Harbor Laboratories, 620 University Road, Friday Harbor W 98250.

The **ANIMAL BEHAVIOR SOCIETY ANNUAL MEETING** will be held 18-22 July 1998 at Southern Illinois University at Carbondale. Plenary speakers include Sidney Gauthreaux, Jane Brockmann, and Jeff Galef. For further information contact Local Host, Lee Drickamer, Dept. Zoology, Southern Illinois Univ., Carbondale, IL 62901, (618) 536-2314, Drickamer@zoology.siu.edu. http://www.cisab.indiana.edu /ABS/index.html

INTERNATIONAL SOCIETY OF CHEMICAL ECOLOGY, 15th Annual Meeting, Ithaca, New York, June 20-24, 1998. The meeting will take place on the Cornell University Campus and will include sessions that emphasize biodiversity and the importance of as yet undiscovered sources of chemical and genomic diversity. The program committee has recruited prominent speakers to introduce a variety of subjects including microbial chemistry, pheromone diversity, multitrophic interactions, intracellular interactions, chemical diversity and biological activity, medicinal links and plant-insect interactions. Contributed papers and posters will be solicited. After the meeting, hikes in Ithaca's gorges or trips on Cayuga Lake will be possible, and a post-conference tour of the Finger Lakes wineries will be arranged. The estimated cost of registration is $200, which includes a welcome reception and a farewell banquet. Several housing options will be available. For information about the Society and the meeting, visit the ISCE web page at http://www.isce.ucr.edu/

For membership, contact: Dr. Jocelyn Millar, ISCE Secretary, Dept. of Entomology, Univ. of California, Riverside CA 92521, Tel: 909 787-5821, FAX 909 787-3086, e-mail: millar@mail.ucr.edu

For more information about the meeting, contact: Dr. Alan Renwick, Boyce Thompson Institute, Ithaca NY 14853, e-mail: jar14@cornell.edu

FACULTY POSITIONS

DEVELOPMENTAL BIOLOGY: The Dept. of Biological Sciences at Florida Tech invites applications for a

faculty position in developmental biology starting August, 1998. Particular interest in individuals using molecular or cellular approaches, however, any contemporary area of developmental biology will be considered. Rank and terms of appointment depends on qualifications and experience. Two years of postdoctoral experience, and evidence of accomplishments in research and teaching required; transmission electron microscopy experience desired. Candidate must develop a research program with extramural funding, direct graduate research, and participate in undergraduate and graduate teaching in developmental biology, mammalian physiology, and anatomy. A new 38,600 square foot F. W. Olin Life Sciences Building is slated for occupancy Fall, 1999. Submit curriculum vitae, three letters of recommendation, and statements of research and teaching interests by February 15, to Gary Wells, Dept. of Biological Sciences, Florida Institute of Technology, 150 West University Blvd. Melbourne, FL 32901. Florida Tech is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

GRADUATE AND POSTGRADUATE OPPORTUNITIES

NIH-funded postdoctoral position available in the laboratory of Cynthia Moss at the **Univ. of Maryland**. Our work emphasizes auditory information processing, spatial perception, and sensorimotor integration, using the echolocating bat as a model system. Current research projects focus on the mechanisms that support rapid adjustments of motor behaviors (head aim, pinna movements and vocal production patterns) in response to dynamic spatial information carried by sonar echoes. Methods include extracellular recording and microstimulation in behaving animals. Excellent opportunity for an individual with experience in neurophysiology and/or neuroanatomy to develop a complementary foundation in behavioral techniques. Laboratory facilities include extracellular recording and microstimulation booth, ultrasound recording and playback systems, high-speed digital video cameras, surgery and histology rooms. We participate in the Comparative and Evolutionary Biology of Hearing Training Program at the Univ. of Maryland, College Park, and possibilities exist for collaborative research with other auditory neuroethology laboratories. Background in extracellular recording and/or neuroanatomical techniques preferred. For more information, visit our Website: http://www.bsos.umd.edu/psyc/batlab. Send CV, statement of research interests and names of three references to Cynthia Moss, Dept. of Psychology, Neuroscience and Cognitive Sciences Program, Univ. of Maryland, College Park, MD 20742, or by E-mail to cmoss@bss3.umd.edu.

Post-Doctoral Position in **Fly Genetics and Behavior**: Applications are invited for the position of Postdoctoral Fellow to study gene networks and brain development as they affect courtship behavior in the fruit fly, *Drosophila*. Previous experience with *Drosophila* is not necessary. Submit a curriculum vitae, statement of research interests and names of three references. to: Dr. Ralph J. Greenspan, The Neurosciences Institute, 10640 John Jay Hopkins Dr., San Diego, CA 92121. FAX: 619-626-2099, e-mail: <greenspan@nsi.edu>

Post-Doctoral Position in **Fly Behavioral Modeling**: Applications are invited for the position of Postdoctoral Fellow to study modeling of the neural basis of behavior in the fruit fly, *Drosophila*. Applicants should have a background in some aspect of neurobiology, preferably related to insects or other invertebrates. Previous experience with *Drosophila* is not mandatory. Submit a curriculum vitae, statement of research interests, and names of three references. to: Dr. Ralph J. Greenspan or Dr. Olaf Sporns, The Neurosciences Institute, 10640 John Jay Hopkins Dr., San Diego, CA 92121. FAX: 619-626-2099, e-mail: <greenspan@nsi.edu>

Postdoctoral and graduate training in **insect neurobiology**. The Arizona Research Laboratories Division of Neurobiology, a unit devoted to cellular, developmental, and molecular neurobiology and neuroethology of insects, invites inquires from prospective postdoctoral fellows and predoctoral students. Inquires, including resume, statement of interests and plans, and names and addresses of three references, should be sent to: Dr. John G. Hildebrand, Director, ARL Division of Neurobiology, Univ. of Arizona, PO Box 210077, Tucson, AZ 85721-0077. Review of applications will begin March 15, 1998 and will continue through December 1998. EOE/AA -M/W/D/V

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