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EXPERIMENTAL BIOLOGY 2005 – SAN DIEGO

ASPET met as a part of Experimental Biology/IUPS 2005, April 2-6, 2005, in San Diego, CA. ASPET and Experimental Biology had record attendance. Some highlights of the meeting included the Opening Reception on the Coronado Terrace overlooking San Diego harbor, the Torald Sollmann Lecture given by Past President Kenneth E. Moore, the first ASPET-Ray Fuller Lecture, given by Randy D. Blakely. Pictures from many of the division activities can be found on the web sites for the Behavioral Pharmacology, Cardiovascular Pharmacology, Drug Metabolism, Molecular Pharmacology, Neuropharmacology, and Systems and Integrative Pharmacology Division web pages.
http://www.aspet.org/public/divisions/behavioral/news.htm , http://www.aspet.org/public/divisions/drugmetab/divisionnews.htm
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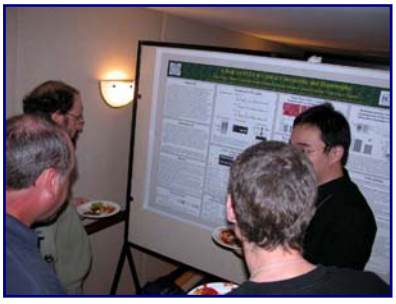
PhRMA Foundation Award Winners Shawn Bratton, Rheem Totah, Melinda Hains and Joshua Krumenacker with Eileen McCarron (l) and George Fuller of the Foundation(r).←

Torald Sollmann Award Winner and Past President Ken Moore with family after the awards ceremony ➔

Division Mixers



MESSAGE FROM THE PRESIDENT

Time does indeed fly. It seems like it was only last week that I wrote my first column for *The Pharmacologist* as the new president of ASPET. As my term of office comes to an end, I want to express my appreciation to all of you for giving me the privilege of serving our Society in this capacity.

The year has been both quiet and eventful. As you may know, the confluence of a declining stock market and the launching of a new journal, together with other initiatives, resulted in some lean years for ASPET's finances. However, thanks to actions by ASPET's leadership over the past few years, as well as those by a dedicated office staff, the budget was back in the black in 2004, albeit barely, and the future is looking bright. ASPET's journals, under the stewardship of the Board of Publications Trustees (BPT), chaired by Brian Cox, are firing on all cylinders. Subscriptions have held up well despite the steady movement to electronic publishing, impact factors are rising across the board as are submissions, costs have been held in check, and publication delays have been reduced. Kudos to Brian and the rest of the BPT as well as to the ASPET Journals staff.

Efforts to maintain open lines of communication with the membership and transparency in the governance of ASPET continue apace. This publication is one example of this. In addition, minutes of the annual business meeting and of meetings of the ASPET Council are posted in the members-only section of the ASPET website.

Public affairs continue to be an important ASPET priority. Under the leadership of Public Affairs Officer Jim Bernstein and the Public Affairs Committee chaired by Gerry Schaefer, there have been notable achievements during the past year. For example, thanks to ASPET's efforts and the splendid cooperation of NIGMS, four universities will host new summer programs for training in systems and integrative pharmacology. Also, ASPET has been in the forefront of the effort to bring to over-the-counter dietary supplements and herbal medications the type of accountability and regulation appropriate for drugs.

ASPET is nearing the 100th anniversary of its founding, which will be celebrated in 2008. Bill Dewey chairs the Centennial Committee, which together with ASPET's Council, has begun planning for the big event. Bill and his committee have proposed a number of ways to commemorate the centennial but would be happy to hear your ideas. The names of the members of the Centennial Committee can be found on the ASPET website. And don't miss the centennial-year meeting, which will be in San Diego. If you are looking for something interesting to do in the meantime, the XVth World Congress of Pharmacology, organized by the International Union of Basic and Clinical Pharmacology (IUPHAR), will be held in Beijing, China, in early July 2006.

I have enjoyed working with you this past year and I look forward to seeing each and every one of you at the Experimental Biology 2006 meeting in San Francisco next April, if not sooner. With my best.

Stephen G. Holtzman

An Appreciation of the Genius of B.F. Skinner

William H. Morse

On the Occasion of Receiving the First P.B. Dews Award in Behavioral Pharmacology
April 2002

It is a pleasure to speak about B.F. Skinner, and others, who promoted what has become the field of behavioral pharmacology, and for this opportunity to express again my own views about the importance and significance of scheduling as a determinant of behavior.

B.F. Skinner

B.F. Skinner conceived of and implemented an original way to study behavior. His influence throughout the world has been so widespread that people who have never heard of him are nonetheless his followers. His approach was neither understood nor appreciated by his peers in the 1930's, perhaps a blessing, in that his creativity was unencumbered by outside influences as he worked alone for over a decade. All the while he was fully aware that his original approach had profound theoretical implications, as well as enormous potential value for practical applications and for many scientific disciplines, including pharmacology. Skinner believed that one could unlock secrets of the central nervous system better with a drug molecule than a scalpel, and throughout his life he had a continuing strong interest in the effects of drugs on behavior. In the 1930's at Minnesota, he published with Heron on the behavioral effects of amphetamines. Skinner undoubtedly would have continued this work had he not been diverted by war-related research and a subsequent move to the University of Indiana in Bloomington, where there was no medical school. After arriving at Harvard in 1948, Skinner repeatedly contacted Professor Otto Krayer in the Department of Pharmacology to ask if there was someone in Krayer's department interested in the behavioral effects of drugs. And finally, in January 1953, there was someone.

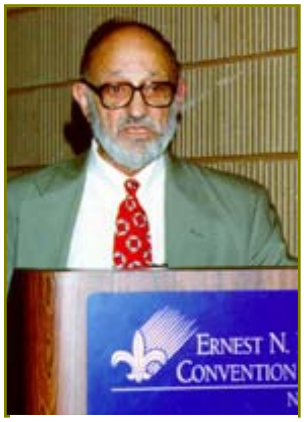
The day when Peter Dews first came to visit, he met with Skinner and then was shown around the three experimental rooms, the shop and the animal quarters of the Pigeon Lab by C. B. Ferster, who collaborated with Skinner in conducting the ongoing research on schedules and in writing "Schedules of Reinforcement." In the course of the tour, the comments that Dews made so impressed Ferster that he offered to let Dews come back later with syringes and solutions of drugs and interrupt the daily sessions of some experiments to make drug injections. Which Dews did, choosing suitable doses of reasonably fast-acting drugs, and, of course, these drug treatments altered the schedule-controlled responding of the pigeons. Such observations alone constituted experiments for Ferster, and he probably would have happily continued this arrangement, but Dews did not fully commit himself to this line of research until he had determined that these procedures had good quantitative sensitivity. Ferster generously made available to Dews an experimental chamber for pigeons, a cumulative recorder, and the necessary control equipment to program fixed-ratio and fixed-interval schedules, and he showed Dews how to wire the controlling electrical circuits. This was really quite something. Before we graduate students in the lab could start an experiment, we had to build the chamber, a power supply, and mount timers and relays and their electrical connections on control panels. But Ferster didn't follow this good practice with Dews.

While a talk about an aspect of B. F. Skinner's creativity is certainly appropriate for this occasion, I also considered the suitability of three other possibilities. Because of the nature of this award, I first considered summarizing the scientific contributions of Peter Dews. I have been associated with Peter on a day-to-day basis for a longer time than with any other person, including my own family. I believe the situation is the same for him, excepting his wife, Grace, who is here with Peter. But as I thought more about describing Dews' contributions, I concluded that he speaks so well for himself that he doesn't need anyone to speak for him.

A second possibility was to speak in general about the development of behavioral pharmacology, a topic with many interesting aspects. When I became a pharmacologist, there was only one recognized specific CNS antagonist, nalorphine, by today's standards a very messy, non-specific drug. Actually, there were other CNS antagonists, strychnine, picrotoxin and yohimbine, for example, but they were talked about in a different way, and the sites at which they acted were not known. Behavioral pharmacology, indeed, all pharmacology, has greatly changed since then. While it might be pleasantly nostalgic to talk about the early years of behavioral pharmacology, I believe the emphasis in this new Division should be forward looking about the excitement of present-day behavioral pharmacology and its future prospects.

A third possibility, modeled after Skinner's "A Case History in Scientific Method," was to speak mainly about my own research history, which I will do before talking about Skinner himself. It's not uncommon for the recipient of an award to describe the progression of their research during their career, but, in my case, it may seem that there hasn't been much progression. For all of my professional life, I have been repeating that the best way to think about behavior and conceptualize it scientifically is in terms of schedule control.

Schedule-controlled behavior involves the succession of behavior, consequences, subsequent behavior and subsequent consequences in a continuing reiteration. Unfortunately, most people understand schedules to be just a formal designation of contingencies, but it is the sequential development over time of particular distinctive patterns of responding that makes schedules important. One can designate a schedule, for example, fixed-ratio 10,000, which will not engender any behavior because the number of responses needed to meet the schedule requirement would never be achieved. The distinctively characteristic patterns that arise from different scheduled contingencies come about through a reiterative sequence of behavioral activities and prescribed consequences.



W.H. Morse presenting the Dews Lecture at EB '02

I will start talking about my research history with the work for my doctoral thesis. In those experiments food-deprived pigeons were exposed first to alternating periods of supra-threshold red and green key lights, each associated with a schedule of food presentation. The scheduling conditions associated with the green key light were then changed to a two-minute period without explicitly scheduled consequences, alternating with a 30-response fixed-ratio schedule of food presentation during the unchanged red condition. Not surprisingly, responding in the presence of the stimulus without scheduled consequences initially depended on what the previous maintenance schedule associated with this stimulus had been. Responding dropped away quickly when the prior schedule had been fixed-ratio, but it persisted when the prior schedule had been variable-interval. The cumulative response records of the sequential pattern of responding and stimulus changes in real time, which reflected the de facto scheduling conditions, provided an explanation of what was going on. When the prior schedule had been fixed-ratio, within the first session there was little or no responding near the end of the two-minute periods with no scheduled consequences, but when the prior schedule had been variable-interval, responses more often occurred near the end of the two-minute period, followed with variable time delays by the onset of the stimulus for the other component. In subjects with certain histories, this change in the key color maintained responding indefinitely and with a distinctive patterning somewhat resembling fixed-interval responding during the component with no explicit consequences. In terms of accepted views of discrimination learning, the pigeons with one history learned the discrimination and, poor fellows, the pigeons with the other history never did. But looked at from the viewpoint of schedule-controlled responding, which considers the influence of histories, transitions and the sequencing of responses and consequences, all the subjects were responding appropriately. The realization of the powerful potential of adventitious contingencies for modifying behavior was for me a profound experience, and I should have made these implications an even more prominent part of my thesis.

Some features of schedule performances may seem inexplicable before the dynamics of the conditions are fully analyzed. For example, bursts of rapid responding often occur when the schedule requires an interresponse time exceeding t seconds, and there can be long pauses without responding under fixed-ratio schedules that engender high rates of responding. But the reproducible, steady-state performances associated with widely studied, well understood schedule conditions do not continue to provide unexpected new insights about behavior. In contrast, behavioral patterns that develop through adventitious contingencies are less uniform and do continue to show intriguing cyclical variation. In a sense, adventitious reinforcement gives something for nothing. When nothing is required and something develops, it gives an inkling about what more there is in the world besides one's own philosophy. "Superstition in the pigeon" is not just some silly thing to laugh about. In fact, that much of our behavior has developed partly through adventitious contingencies is probably a good thing. Behavior controlled by powerful, precisely-scheduled consequences, such as in pulling slot machine levers, often can be unproductive.

I could have happily continued studying the effects of adventitious contingencies associated with different histories forever, but it was suggested that my research partner, Dick Herrnstein, and I should conduct some drug studies in conjunction with our behavioral experiments. Adventitious contingencies are not so well suited for determining dose-effect functions as many other scheduling procedures that engender highly reproducible patterns of responding, and one does need to choose experimental procedures for the purpose at hand. While the idiosyncratic features of behavior developed through different histories may have broader implications for understanding how individuals get to be the way they are, than, for example, a monkey flicking its tail out of hot water, the latter procedure is better by orders of magnitude for studying the analgesic effects of drugs. Initially, I was not at all enthusiastic about our doing these studies with drugs acting on the brain. I had then, and still have, a strong aversion to the reductionistic approach of explaining observable ongoing behavioral activities in terms of something happening in the brain. But on the positive side, our advisor in this new enterprise was Dews, and he seemed genuinely interested in behavior as such. Eventually I was won over, mainly because I liked talking with Dews. I still do.

Just as is the previously described example of adventitiously-maintained responding in the presence of a stimulus, the effects and specificities of many drugs are determined by the individual's own behavior in a situation. Even the direction of an effect—an

increase in responding or a decrease in responding—can depend on the scheduling conditions. Such empirical findings obtained in highly controlled experimental environments apply also to everyday life. To give an example that has been frequently replicated, just one beer at lunch before a mid-afternoon seminar may have a soporific effect, but not so at a lively party, a poker game or a late-night discussion of the meaning of life. Such situational-specific differences in the effects of drugs are often regarded as generalized states, but when external stimuli have been associated with different well-developed schedule-controlled responding, the effect of a drug can be altered immediately simply by changing the external stimuli. For example, after a suitable dose of pentobarbital, responding in a pigeon during stimulus periods of a fixed-ratio schedule will be slightly increased, maybe 10%, while the pigeon's gait will be ataxic and stumbling during alternate stimulus periods where locomotion in the experimental chamber has developed adventitiously. The ataxia will disappear completely with the onset of the fixed-ratio schedule condition and reappear again when the alternate stimulus comes back on.

During the happy years when I worked with R.T. Kelleher, we began exploring how various other conditions are influenced by scheduling factors. In particular, Kelleher and I looked at cardiovascular functioning and at the effects of brief noxious stimuli associated with different scheduling conditions. We found that blood pressure, heart rate and cardiac output, and also their modification by drugs, can be modulated by schedule-controlled responding. Additionally, both the quantitative and the qualitative effects of noxious electrical stimuli on an individual's behavior depend jointly on that individual's history and the presently prevailing scheduling conditions. Similarly, the effects of drug injections, both noxious and non-noxious, depend on schedule histories. Such findings as these are unappreciated and poorly understood partly because most laboratory studies are done under highly restricted conditions.

The familiar conditions of a particular experimental procedure should not be tacitly presumed to have generality beyond those conditions. When untrained subjects are treated in commonly accepted standard ways, which is, of course, generally a good experimental practice, it is not possible to evaluate how much the resultant behavior depends on the individual's experience. But one has only to look at situations in which individuals have widely different past experiences, as all of us do, to appreciate that an individual's past and present behavior is itself a dominant feature in any environment, experimental or otherwise. How each of us behaves in most situations, in fact, virtually everything that is done habitually, is less determined by the features of the current external setting than by our own experience – by our particular history. How an individual interacts with a spouse or with friends, or the pleasure in doing a particular kind of work, such as a geologist cracking rocks open with a hammer, or a chemist pouring solutions out of bottles without spilling, depends preponderantly on the individual's experience. On a recent program of "Larry King Live," when Peter Jennings was asked about bias in reporting, he said, "We all bring baggage with us." That includes laboratory rats and monkeys. Many of you are involved in studying how the properties of injected drugs can come to control behavior. This is accomplished by giving rats or monkeys explicit scheduling histories, and it is the history of a subject, its baggage, that explains how it behaves after a drug injection. What an individual brings into a situation influences the impact of the environmental events called discriminative stimuli, reinforcers or punishers. Further, in many situations, as in sports or in making music, the feedback from an individual's ongoing behavior actually produces many of the consequences that continue to shape and maintain the behavior.

Psychology has always been dominated by a concern with stimuli in the external environment, but behavioral pharmacology need not be. It's cumbersome and unnecessary to think of the influence of experience or of scheduling factors as stimuli. Behavioral pharmacology played an important part in developing the line of thought that behavior itself alters behavior. Dews suggested in 1958 that the effects of amphetamines depended mainly on what the individual is doing. There is much more to contemplate about the rate-dependency hypothesis than a straight line with negative slope.

I have a reputation for sometimes digressing tangentially and for wandering off the course when sailing. To get back on the course of the title of this talk, I turn now to describe an aspect of the creativity of B. F. Skinner.

I knew B.F. Skinner for over 30 years and associated with him on a near daily basis for a period of 5½ years. Skinner was a brilliant person and undoubtedly would have been outstanding in many endeavors other than science. Early in his career he published one paper on alliteration in Shakespeare's writings, and had he continued this line of work as an English scholar, it is likely that alliteration would have become an important topic of study. He could have been an actor; he had a fine ear for mimicry and was a wonderful story teller, but this social aspect of Skinner's personality simply wasn't there when he was working. His self-discipline in his professional life was incredible, to such an extent that it alone would have ensured outstanding productivity. If he was interrupted while working in his office, he would turn away from his desk or would leave the room. Skinner's office was for him an environment for working, mainly writing, and he was under near-perfect control. In his book "*Science and Human Behavior*" there are chapters on "Self-Control" and "Thinking" that explain how an individual can manipulate the environment to control one's own behavior. Anyone associating with Skinner could see that he put these techniques to use personally, and, indeed, he would often talk about different ways to control one's own behavior.

I want to describe an aspect of Skinner's behavior that I never heard him speak of directly, although it pervaded all that he did, and I am sure he was aware that it was his habitual approach to everything. I believe that he must have been this way all his life. I will illustrate this aspect of B.F. Skinner's genius by examples, but first let me describe it verbally. I will say, categorically, that he never contemplated any pursuit, intellectual or otherwise, except in terms of how it could be accomplished. While he always had a starting direction for any endeavor, he was also very empirically minded, and often the direction would change depending on what was encountered.

To say this another way, Skinner's own approach to science and to life reflected the epistemological point of view called Operationism. The essence of Operationism is that what you talk about in science should be defined explicitly in terms that are measurable. Skinner came to Harvard just after Bridgman espoused Operationism in his book "*The Logic of Modern Physics*", and Skinner much admired Bridgman. In 1952, as a graduate student, I had the wonderful opportunity to attend evening meetings where Bridgman, Skinner and others discussed epistemology in science. Perhaps tongue-in-cheek, Skinner said behaviorism was "nothing more than a thoroughgoing operational analysis of traditional mentalistic concepts". While Skinner did not agree with the way Bridgman and other proponents of Operationism dealt with either the private behavior or the verbal behavior of the individual, Skinner himself was a living example of Operationism. Everything that he talked about had an explicit referent and everything that he did was based on an explicit approach for its accomplishment.

Let me turn now to examples of how Skinner behaved. The first example was told to me and may be apocryphal, but it's consistent with what I observed about Skinner. He went out to play golf for the first time and had some trouble hitting the ball. When he got home, he built a club that made hitting the ball easier for him. That was his way of dealing with the world. He was not only interested in what the world is, he wanted to change it to make it a better world for people. Behavior was his primary interest, but he cared less about understanding behavior compared to changing behavior to make it be more fulfilling and productive.

His approach to caring for a young baby by building a controlled environment to make the quality of life better both for parents and child is widely known, and I need not describe that here.

For a number of years he spent much of the summer on Monhegan Island in Maine, where the family had a small sailboat. He didn't like the boat heeling over when the wind filled the sail attached to the rigid mast, so he worked out a design with the mast replaced by a rope held aloft by a kite. (Skinner loved kites, but then, who doesn't like flying kites?) In this instance he went back to Cambridge before he got it just right.

When Skinner made a new device for some particular purpose, the first model didn't always work perfectly, but a first mock-up model served to point toward making a better model. Skinner loved using Duco Cement and rubber bands to make things quickly; good duct tape wasn't available then. After Ferster, Herrnstein and Nathan Azrin left the Pigeon Lab, for some time I worked alone with Skinner. Very often he would bring in something and tell me I could use it to good purpose in one of our experiments. These items were generally made with Duco Cement and rubber bands, what today would be called a Beta model. Usually I could figure out a way to make whatever it was workable for daily use, but once I simply continued using the item he brought me, and it kept failing. When I mentioned this to Skinner, he was surprised that I had continued using a flimsy thing intended only to give me an idea for how to move on. In the Pigeon Lab there were shelves in the back room with literally dozens of response keys and feeders for both rats and pigeons. Beta 1, beta 2, beta 3, etc. A pessimist looking at the shelf might have said, "These people aren't too good at designing," but the shelf represented continued progress toward making better and better experimental set-ups. Once, walking back from lunch in Harvard Square, I asked Skinner, "When you first started working with pigeons, did you already know they would be such good laboratory subjects?" and he said, "They weren't."

Clearly Skinner liked making novel devices, but he didn't just make a gadget and then hunt for a use for it (well, maybe sometimes!). Habitually he made things that allowed him to accomplish some definite purpose. For example, we did one experiment in which a pigeon would be in an experimental chamber for extended periods, up to weeks, and we contrived to have it respond more or less continuously. (Today, the hypothesis of the paper might be the question, "Does the pigeon ever sleep?") Anyway, once every hour the main interresponse time schedule alternated with another component. A separate cumulative recorder was in operation only during this alternate component. When the paper feed for this recorder was stopped for an hour, during this time a little bit of ink came out of the recording pen and made a dark dot on the recording paper. While this was really something you could live with, it was a mark of one's competency in the lab never to have smudged records because you might want to photograph this particular session. Both red and black ink had certain advantages for producing perfect tracings, and the proportions of ink to water could be changed for different paper speeds. In this instance Skinner eliminated the dark ink dot on the recording paper by soldering an angled piece of Phosphor bronze on the pen holder so that the pen moved up a ramp and was lifted off the paper by the operation of the pen solenoid for the hour period when the paper didn't move. I probably shouldn't mention that the first working model lifted the pen up in the air

too forcefully, and we had Jackson Pollocks all over the paper. I wouldn't go so far as to say that building the little phosphor bronze ramp was what Skinner liked most about this experiment, but it did please him to take the blot off his record.

When Herrnstein and I were beginning graduate students, Skinner was once asked to review a grant application on the detection of a magnetic field by some species of bird. Being an empirically-minded person, Skinner's approach was to come into the lab with a big permanent magnet and tell Herrnstein to see if there is anything to this. Of course, he had a plan of action. Herrnstein and I were doing experiments with pigeons using a properly sound-attenuated 2-key chamber. Skinner had Herrnstein mount a wooden strip on the back side of the vertical key panel and then drill a hole in each side of the sound-attenuated chamber so pieces of string tied to the magnet resting on the wooden strip could be led outside and the magnet could be pulled by the strings, left or right, to be behind whichever key was associated with the schedule in effect. In that brief experiment there was no indication that any pigeon's responding was controlled by the location of the permanent magnet. I'm glad I didn't happen to be there that day, because having to drill holes in our sound-proof chamber would have been for me worse than a dark ink spot on a record.

I remember vividly my next example. Armistice Day, November 11, 1953, was a holiday. Ferster, Herrnstein and I were in the lab working. That morning Skinner had gone to an open house at Shady Hill School where his daughter Deborah was a student. Someone from the school made a presentation about difficulties in teaching the desired curriculum, especially math. Skinner was not at all sympathetic to a teacher saying that it was difficult to teach children some subjects. Whoever it was that made the presentation actually did a good thing for education by arousing a sleeping giant. After leaving the school, Skinner came to the lab, stopping on the way trying, unsuccessfully, to buy a pen or pencil with a multiplication mechanism on the shaft. These were cylindrical devices where the alignment of two different numbers by rotating separate parts of the cylinder yielded the product of the numbers, 3 x 4 = 12. I think he wanted this device just to take apart to see how it worked. Anyway, in the lab, Skinner started building what became a circular turntable powered, I think, by rubber bands, but maybe a spring, that would spin until a tab detent under the turntable was stopped by a wooden shaft that slid in along a radius of the turntable. Both detent and the shaft could be moved from near the center to near the perimeter of the turntable, and their positions were indicated by numbers glued on with Duco Cement. And lo and behold. If the detent and shaft were set with 3 and 4, the turntable stopped at a place marked 12. I know Skinner didn't get very far the first day, because in the afternoon our whole group went with S.S. Stevens to a session of the National Academy of Sciences at MIT. One of the presentations was by Jesse Beams, a physics professor at the University of Virginia, my alma mater. As is often the case, I thought I fully understood his presentation at the time.

From Armistice Day on, Skinner talked quite a lot about the need to apply known behavioral principles to education. He worked every day on building a teaching box for arithmetic. When he had a first model, he gave it to a woodworker in the shop to make another that was more substantial. The box came along steadily but there was something unreliable to do with the tab detent. On some occasion he was with Edwin Land of Polaroid and told Land that he was building a device to teach multiplication but he had a problem with the detent that stopped the turntable at the product of two numerical settings. Land said to Skinner, "You ought to hire yourself a consultant detent engineer." Land himself was a genius, and perhaps hiring a consultant is the best way in business, but that was not Skinner's way. He continued with the multiplication box until it was working and, of greater importance, it had furnished leads for the next teaching machine, which dealt with verbal material. That, of course, required writing the material for programmed verbal instruction. Early models of teaching machines were followed by a set of machines robust enough to be used without breaking down in teaching Skinner's large course on behavior, Natural Sciences 114. Again, this required writing the programmed instruction for this course, mainly by James Holland, who co-authored with Skinner "*The Analysis of Behavior.*" And so it continued, with programmed instruction becoming an important part of education in the United States.

In history there have been lots of approaches to education, and discussions about improving education still go on today. I estimated that in 1954 there were some three million teachers in the United States, and from the time of Thorndike and John Dewey at the turn of the century, there must have been ten to fifteen million professionals concerned with education. I think it is obvious to everyone here that probably not a single one of those many people, if confronted with how to improve education, would have gone about it by building a turntable. Moreover, probably all of them would have found it incomprehensible, if not idiotic, for someone else to do so. But Fred Skinner never contemplated anything, even a big idea like how to improve education, in a vacuum; it was always in the context of how it could be accomplished.

Let me turn back for a moment to Operationism. Critics of this approach have claimed that it stifles creative imagination, and there certainly are many instances of really wild ideas eventually amounting to something. But on the other side, how many hours and days have we all wasted considering insoluble problems and ultimate goals with no clear direction toward reaching them. Skinner's habitual approach to science and to life was to approach everything in terms of a way to proceed. The initiation of a particular endeavor was often a long way from its eventual completion, for example, teaching machines and programmed instruction, but, at every step, Skinner was always doing something that could be carried out successfully, and thereby was shaping his own behavior

with successes. Think how good it would be to always be succeeding in whatever we're trying to accomplish. Skinner was indeed a genius in the way he shaped his own behavior.

My last anecdote is about a social occasion described to me by Peter Dews. It is essential to this talk, so, once again, I have benefited from Peter's help. Unlike the day the magnet experiment got started, I wish I had been present on this occasion. It was afterwards that Peter told me about a conversation where someone asked Skinner what he considered to be his most outstanding contribution. At this time Skinner had written "*The Behavior of Organisms*", "*Science and Human Behavior*", and "*Walden Two*", and a couple of other books were in preparation. He was a member of many prestigious societies, including the National Academy of Sciences. His work had inspired many others to follow his approach to studying behavior, and concepts derived from his work were widely accepted even by non-experimenting psychologists. Skinner was widely regarded as the most eminent psychologist in the world. When asked what his most important contribution was, without hesitation, Skinner immediately replied, "The cumulative recorder."

Skinner published a paper in 1930 on the gradual exponential decline in rate of eating small bits of food in the food-deprived rat given access to a food source. The purpose of this work was to show that orderly changes in behavior could be studied in situations where there were no controlling external stimuli. The feeding device permitted the rat to obtain uniform pieces of food in such a way as to make an electrical contact for each piece taken. The writing point on the recording drum was devised to be lifted vertically one unit step for each contact, with the record being a line running step-wise diagonally up the kymograph paper, which moved at a constant speed (slope kymograph). His article noted that by recording the contacts cumulatively, their rate of occurrence could be measured directly. In a subsequent paper Skinner considered the possibility that the rate of eating, recorded as switch closures resulting from pushing open the door to the food tray, might have been constrained by the features of the feeding device. To check on this he did what could be considered as a sort of control experiment, using a different set-up where "The food tray is accordingly replaced by a repeating "problem box," which delivers a pellet of food into an open trough each time a horizontal lever is pressed downward." Under the new conditions, with a different physical response, the rate of eating was the same as before.

But now, by having an initial response that arbitrarily controlled the pellet delivery, it was possible to schedule other arbitrary contingencies, delays, number requirements, and minimum time constraints, all of which Skinner studied in the 1930s by recording the rate of key presses on a cumulative recorder. By suitably choosing the step size of responses and the speed of the paper drive, it was possible to accurately measure the rate and pattern of responding associated with different scheduling procedures. After World War II, it had been Skinner's intention to use these procedures to study phenomena associated with psychological concepts, especially "higher mental functions." However, when Skinner and Ferster began to systematically study different scheduling procedures, they found the influence of these schedules was orders of magnitude greater than any traditional variables studied in psychology. For example, in a pigeon or monkey in which each instance of some response has been shaped by contingent food delivery, if food deliveries are stopped, perhaps up to several hundred responses may occur. Under these conditions even many, many repeated presentations of food will engender, at most, limited responding lasting only a short time. But stopping the delivery of food presentations when they have been associated with a history of responding under many intermittent schedules can result in tens of thousands of responses over extended periods of time, and there is no other way, except by intermittent scheduling, to engender such strong behavior. The effect of a food delivery to an animal depends upon that individual's scheduled history.

The way the present environment affects all of us depends upon what we have experienced in the past, and it should be clear from observing individuals behaving in real life that we are not all equally controlled by the same consequences. It is the sequential interplay of behavioral activities, their consequences and subsequent behavior that engenders our individuality. Behavior develops from a sequential scheduling history, and how consequences in the environment further modify behavior depends on that history. It was with cumulative recorders, displaying the sequential occurrence of ongoing behavior in real time, that Ferster and Skinner demonstrated the overwhelming influence of schedule control on behavior. Unfortunately, there is too little concern today with the evaluation of ongoing behavior in real time.

Skinner once said, "A descriptive system is never popular." I would be pleased if this talk has persuaded some of you not already so inclined that a scientific conception of behavior in terms of scheduling, the repetitive sequence of behavioral activities and consequences, is preferable to an overwhelming emphasis on the primacy of reinforcers and punishers without regard to ongoing behavior itself. I do hope that for all of you, the examples in my talk have given insight about an aspect of B.F. Skinner's genius, and why it is completely understandable that Skinner himself would have said that his most splendid achievement was developing the cumulative recorder.

At this point, logically and dramatically, this talk should end, but there is something more I want to say about individuals who promoted the early development of behavioral pharmacology. I have already mentioned Skinner and Ferster. Skinner studied the behavioral effects of amphetamines in the 1930s, almost 70 years ago. He proselytized to get pharmacologists interested in studying

behavioral effects of drugs, and he supported Ferster's setting Dews up in business. Just in doing that, Skinner and Ferster made an enormous contribution in steering behavioral pharmacology off in a good direction.

It is with strong personal feeling that I acknowledge the influence on behavioral pharmacology of Professor Otto Krayer. It was Dr. Krayer who said to Dews, "You ought to go over and see this fellow Skinner." When Dr. Krayer hired Peter Dews to be in his department, he suggested a line of work for Dews to pursue, but when Dews began studying drug actions on schedule-controlled performances in food-deprived pigeons, Dr. Krayer backed him completely. That was consistent with Dr. Krayer's view that it was his obligatory duty to provide the best supporting environment possible for everyone in his department, and he encouraged diversity in pharmacology. Most of the research in that small department was whole-animal cardiovascular pharmacology, but besides Dews, another person was studying drug-induced changes in web-building in spiders, an organic chemist made drugs with cardiovascular actions, and others did research in autonomic and biochemical pharmacology. The year after Dews began studies on behavior, while I was still a graduate student in Skinner's lab in a different department, Dr. Krayer arranged for me to be a Milton Research Fellow in Pharmacology, a much fancier appointment than Teaching Fellow, and, after deliberations undoubtedly influenced by not having to give me financial support, my department let me accept this somewhat unusual appointment. Three years later, and at a time when my depth in pharmacology was very shallow indeed, Dr. Krayer offered me a regular appointment in his department. Dr. Krayer also served as my sponsor for a Research Career Development Award. Still later, he gently demanded that Kelleher and I write, under his supervision and to his satisfaction, a readable, scholarly review of the field of behavioral pharmacology for Ergebenesse der Physiologie. Dr. Krayer thought such a review would serve a good purpose for pharmacology in general and also for those with specialistic interests. I have later wished that Dr. Krayer had summoned Kelleher and me to write to his satisfaction more specifically about schedule-controlled behavior.

Besides Dr. Krayer, there were other established senior pharmacologists who supported and encouraged research on behaviorally active drugs. To name only a few individuals with whom I had some personal association: Karl Beyer, K.K. Chen, Maurice Seevers, Lloyd Roth, Klaus Unna, and the endocrinologist and NIMH administrator extraordinary, Fred Elmadjian. Elmadjian believed that interdisciplinary training programs in biological sciences should be located in Departments of Pharmacology and that it was essential for them to include, in his words, "the dimension of behavior." Contemporary behavioral pharmacology is focused on specificities at selective receptor sites, and properly so, but I would hope that future investigators studying the actions of drugs on behavior in selective assays will not completely forsake the broader implications of "the dimension of behavior." Behavioral pharmacology has already made significant contributions to a better scientific understanding of behavior, and it can continue to do so.

Acknowledgement

I thank the Division of Behavioral Pharmacology of ASPET for giving me the P. B. Dews Award. I wish that it could have been shared with Roger Kelleher. I am indebted to James W. McKearney for helpful comments on an earlier draft of this talk and to Patricia Morse, Jonathan Katz and Donna Reed for help in its final preparation.

W.H. Morse and P.B. Dews at EB '02 Awards Ceremony

Deadline for Nominations for P.B. Dews Award for 2006 is September 15, 2005

A Biography of Peter Dews by Jonathan Katz is on page 69 of this issue

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2006 Subscription Prices Set

ASPET's Board of Publication Trustees set the 2006 subscription prices for the Society's five journals during a conference call on May 27. The BPT reviewed the journals' finances, subscription trends, current prices in comparison to those of similar journals, and projected increases in the numbers of pages to be published.

After considering all relevant data, the BPT approved a 10% increase in member subscription prices to *JPET*, *Pharmacological Reviews*, *Molecular Pharmacology*, and *Drug Metabolism and Disposition*. Nonmember and institutional rates will increase by 6% for *JPET* and *PharmRev*. *MolPharm* prices will increase 9%, and *DMD* will go up 8%. Nonmember and institutional prices for *Molecular Interventions* will increase by 5%.

The price increases are necessary because of rising costs and the publication of more pages. *JPET* is projected to publish 9% more pages in 2005 than in 2004, *DMD* will publish 15% more pages, and *MolPharm* will publish 33% more pages.

The online manuscript systems, faster turnaround times, and increased impact factors for *JPET*, *MolPharm*, and *DMD* have led to significant increases in submissions. Acceptance rates have dropped somewhat, but increased submissions have outpaced those changes.

ASPET members have online access to all five ASPET journals as part of their member benefits. If you have not yet activated your online subscription, please contact info@aspet.org for assistance.

Authors' Fees to Increase

The Board of Publications Trustees has voted to increase author fees for *JPET*, *Molecular Pharmacology*, and *Drug Metabolism and Disposition*. Manuscript submission fees will increase from $40 to $50. Page charges will increase from $60 to $70 per published page for nonmembers and from $30 to $35 for members. The new charges will go into effect as soon as the manuscript submission systems and page charge forms can be updated.

The manuscript submission fee does not cover the actual cost of conducting peer review for a paper—it only helps defray the cost. Likewise, the actual cost to publish an article online and in print is much higher than the Society's page charges. Based on current article lengths, the higher fee will result in a $90 increase for the average *JPET* or *MolPharm* article and a $70 increase for the average *DMD* article. These average increases are for nonmembers. Members would see an average increase of half those amounts.

ASPET Exceeds NIH Access Policy

On May 2, the NIH opened its online system for authors to voluntarily deposit manuscripts that come out of NIH-funded research. The manuscripts, which must be accepted for publication in a peer-reviewed journal before being deposited with the NIH, are to be available from PubMed Central.

The week before, ASPET began exceeding the NIH's plan for free access. "Fast Forward" (publish ahead of print) articles in *JPET*, *Molecular Pharmacology*, and *Drug Metabolism and Disposition* were made freely accessible upon publication. The Fast Forward version will remain freely accessible after the copyedited and formatted version is published in an issue. This applies to all articles published in these journals—not just those funded by the NIH. All ASPET journal articles become freely accessible 12 months after final publication.

The Fast Forward version will remain freely accessible after the copyedited and formatted version is published in an issue.

The copyright transfer forms for these journals have been modified to allow authors to deposit their NIH-funded articles with PubMed Central. However, authors are asked to make their articles accessible at PubMed Central 12 months after publication in ASPET's journals. Authors do not need to specify the publication date when making a deposit. They just have to set the amount of time until release.

There are two reasons for asking authors to specify a 12-month delay at PubMed Central. First, hit counts are important. As companies switch from print to online advertising, it is essential that readers view ASPET journal articles at ASPET's web sites. Hits diverted to PubMed Central (or any other non-ASPET site) make ASPET's journals a less desirable place to advertise online. The Society does not derive a great deal of advertising income from its journals, but it cannot afford to lose what income it has. Some print advertisers have already started switching to online ads. We are working to develop this source of support for the journals. Librarians also track hits. ASPET's journals provide usage reports that conform to standards developed by the library community. If an institution sees a drop in hits to ASPET's journals because readers are accessing articles elsewhere, the institution may drop its subscriptions.

It is important for both the journals and authors that articles are correctly cited and attributed to the journals in which they are published.

Second, it is important for both the journals and authors that articles are correctly cited and attributed to the journals in which they are published. During a demonstration of the PubMed Central web site, Dr. David Lipman of the National Library of Medicine indicated that there is a strong desire to make articles citeable as appearing in PubMed Central, independent of the journal in which it is published. The Science Citation Index will not include such citations. Therefore, these citations will not count toward the journal's impact factor, nor will they be counted for the article's authors. Both the journal and the authors lose.

Fast Forward articles are indexed in PubMed and Google. This makes them easy to find. They are clearly displayed on the journal's web site, making them easy to browse. It appears that browsing will not be possible for articles at PubMed Central; they will only be found through keyword or author searches.

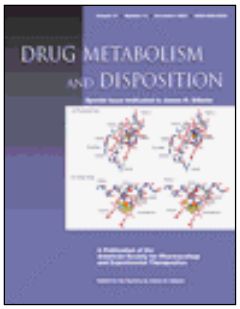
Librarians have stated that they want the copyedited, fully formatted, final versions of record for their collections. We do not anticipate subscription cancellations as result of access to Fast Forward articles, but we will closely monitor subscription sales for any negative impact.

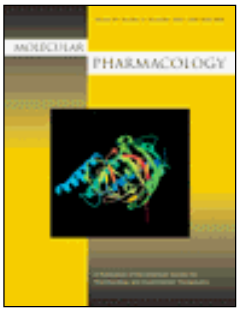
The changes implemented by ASPET exceed the NIH's goals of providing greater public access to research. Permitting authors to deposit their manuscripts with PubMed Central allows the NIH to better track the results of NIH funding. By asking authors to abide by the 12-month publication delay at PubMed Central, we can maintain the viability of ASPET and its journals. Everybody wins under ASPET's policy.

If you have questions about ASPET's policy, please contact Rich Dodenhoff, ASPET's Journals Director, at rdodenhoff@aspet.org.

Journal of Pharmacology and Experimental Therapeutics

Drug Metabolism and Disposition





Molecular Pharmacology

Pharmacological Reviews

Molecular Interventions

Public Affairs/ Government Relations

House Passes Stem Cell Vote in Historic Vote

The House passed The Stem Cell Research Enhancement Act, HR 810 on May 24. The bill authorizes federal funding for stem cell lines derived from leftover embryos created by *in vitro* fertilization. HR 810 passed with 238 votes in the House, including 50 Republicans. Reps. Diana Degette (D-CO) and Michael Castle (R-DE) cosponsored HR 810. ASPET members and hundreds of other organizations in the research community all provided generous grassroots support.

Senate sponsors of the companion Senate bill, the Stem Cell Research Enhancement Act (S.471), including Sens. Arlen Specter (R-PA), Tom Harkin (D-IA), Orrin Hatch (R-UT), Dianne Feinstein (D-CA), Gordon Smith (R-OR), and Edward Kennedy (D-MA), are urging Senate leadership to quickly bring the bill Senate floor for a vote. S.471 currently has 32 sponsors. ASPET members are asked to contact their Senators now to enlist their support for passage of the bill. For help in contacting your Senators, visit: http://capwiz.com/faseb/issues/alert/?alertid=7148736&type=CO
And http://www.stemcellfunding.org/fastaction/.
President Bush has threatened to veto the legislation should it reach his desk.

NIGMS Awards Four Institutions to Support Training in Integrative and Organ Systems Pharmacology

The National Institute of General Medical Sciences (NIGMS) will fund four short course workshops to support training in integrative and organ systems pharmacology. These programs recognize the importance of studies using intact organ system and in vivo models in the conduct of research. The Award is made to a lead institution from among a consortium of institutions that will play a collaborative role in teaching and research interactions among participants. View: http://www.aspet.org/public/public_affairs/pa_NIGMS_shortcourse_awards.html. For more information on ASPET's advocacy for increased support for training and research in integrative and whole organ systems pharmacology visit http://www.aspet.org/public/public_affairs/pa_sip.html.

ASPET-Merck Postdoctoral Fellowship in Integrative Pharmacology

One award will be made for outstanding research proposals in cancer pharmacology. Interested candidates can view details at http://www.aspet.org/public/merck_fellowships/guidelines.html.

NIGMS Feedback Loop E-Newsletter Launched

NIGMS has launched an e-mail newsletter to alert the scientific community to NIGMS funding opportunities, trends, and plans. The newsletter, called the NIGMS Feedback Loop, also encourages readers to provide input and feedback on Institute activities. To read the first issue, which includes a message from NIGMS Director Dr. Jeremy M. Berg and information on NIGMS funding trends, go to http://www.nigms.nih.gov/loop. To subscribe to receive future issues, go to http://list.nih.gov/cgi-bin/wa?SUBED1=nigms-feedback-loop&A=1

Senate hearing on Animal and Environmental Terror

On May 18, the Senate Committee on Environment and Public Works held a hearing to explore the role of animal and environmental terrorism. For ASPET members interested in learning more, the entire hearing is available as a cybercast on the Committee's website, at http://epw.senate.gov/epwmultimedia/epwmultimedia.htm.

ASPET-MERCK POSTDOCTORAL FELLOWSHIPS IN INTEGRATIVE PHARMACOLOGY

Cancer Pharmacology

Philosophy: The major goal of the ASPET-Merck Postdoctoral Fellowships in Integrative Pharmacology (The ASPET-Merck Fellowships) is to increase the number of well-trained scientists with expertise in pharmacology and in integrative, whole organ systems pharmacology.

Eligibility Guidelines: The ASPET-Merck Postdoctoral Fellowships in Integrative Pharmacology supports post-doctoral training of scientists (M.D., Ph.D., D.O. or related degree) with demonstrated interest and experience in *in-vivo* pharmacology. Fellowships are for post-doctoral training at a U.S. academic institution (non-profit, private, or public).

Research Area of Interest: One award will be made to support training in Cancer Pharmacology. Research proposals must have a strong *in vivo* component and clear evidence of an integrative, whole organ systems approach.

Duration: The Fellowship term is three years. No less than six months of the Fellowship will be spent at the Merck Research Laboratories in Boston, MA.

Terms: The Award provides the following per annum funding:

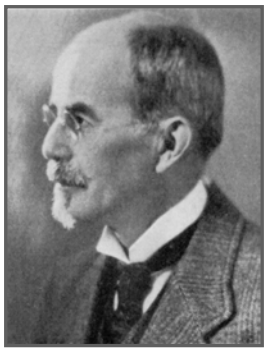
- $42,000 stipend
- $3,000 travel expenses
- $10,000 institutional allowance

Application Guidelines: Application deadline is September 9, 2005. Recipient of award will be notified by November 15, 2005. Fellowships must begin in 2006. For detailed Fellowship application guidelines, terms, and procedures visit Featured Links on the ASPET web site at

www.aspet.org

CALL FOR AWARD NOMINATIONS FOR 2006

JOHN J. ABEL AWARD



The John J. Abel Award in Pharmacology, supported by Eli Lilly and Company, was established to stimulate fundamental research in pharmacology and experimental therapeutics by young investigators. The annual Award consists of $2,500, a plaque, and travel expenses for the winner and spouse to the award ceremony at the annual meeting of ASPET.

Nominees for this award shall not have passed their **thirty-ninth birthday on April 30** of the year of the Award. The candidate need not be a member of the Society; however, a nomination must be made by an ASPET member, and no member may nominate more than one candidate a year. The Award shall be made for original, outstanding research in the field of pharmacology and/or experimental therapeutics. Independence of thought, originality of approach, clarity and excellence of data presentation are important criteria. Candidates shall not be judged in comparison with the work of more mature and experienced investigators. Quality rather than the number of contributions shall be emphasized. It shall be the responsibility of the sponsor to make clear the contribution of the candidate to any jointly authored reprints and manuscripts and the originality and independence of the candidate's research. Selection will be made by the J.J. Abel Award Committee, appointed by the President of ASPET.

Nominations shall be accompanied by six (6) copies of each of the following:

1. Summary that describes the importance of the candidate's work.
2. Each of six published articles or manuscripts accepted for publication that are a representation of the candidate's work.
3. Brief biographical sketch of the candidate.
4. Candidate's *curriculum vitae* and bibliography.

Nominations for this Award must be received no later than **September 15, 2005,** by the Executive Officer, American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, Maryland 20814-3995.

Winners of the John J. Abel Award

1947	George Sayers	1966	Lewis S. Schanker	1985	P. Michael Conn
1948	J. Garrott Allen	1967	Frank S. LaBella	1986	Gordon M. Ringold
1949	Mark Nickerson	1968	Richard J. Wurtman	1987	Lee E. Limbird
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1951	Walter F. Riker, Jr.	1970	Solomon H. Snyder	1989	Kenneth P. Minneman
1952	David F. Marsh	1971	Thomas R. Tephly	1990	Alan R. Saltiel
1953	Herbert L. Borison	1972	Pedro Cuatrecasas	1991	Terry D. Reisine
1954	Eva K. Killam	1973	Colin F. Chignell	1992	Frank J. Gonzalez
1955	Theodore M. Brody	1974	Philip Needleman	1993	Susan G. Amara
1956	Fred W. Schueler	1975	Alfred G. Gilman	1994	Brian Kobilka
1957	Dixon M. Woodbury	1976	Alan P. Poland	1995	Thomas M. Michel
1958	H. George Mandel	1977	Jerry R. Mitchell	1996	John D. Scott
1959	Parkhurst A. Shore	1978	Robert J. Lefkowitz	1997	David J. Mangelsdort
1960	Jack L. Strominger	1979	Joseph T. Coyle	1998	Masashi Yanigasawa
1961	Don W. Esplin	1980	Salvatore J. Enna	1999	Donald P. McDonnell
1962	John P. Long	1981	Sydney D. Nelson	2000	William C. Sessa
1963	Steven E. Mayer	1982	Theodore A. Slotkin	2002	Steven A. Kliewer
1964	James R. Fouts	1983	Richard J. Miller	2003	David S. Bredt
1965	Eugene Braunwald	1984	R. Peter Guengerich	2004	David P. Siderovski
				2005	Randy Hall

CALL FOR AWARD NOMINATIONS FOR 2006

THE PHARMACIA-ASPET AWARD IN EXPERIMENTAL THERAPEUTICS

The Pharmacia-ASPET Award in Experimental Therapeutics is given annually to recognize and stimulate outstanding research in pharmacology and experimental therapeutics—basic laboratory or clinical research that has had, or potentially will have, a major impact on the pharmacological treatment of disease. The award is supported in perpetuity by a gift from Pharmacia. The winner will receive a $2,500 honorarium, a bronze medal, and travel expenses for the winner and spouse to the award ceremony at the ASPET annual meeting.

There are no restrictions on nominees for this award. The Award shall be made on the basis of published reprints, manuscripts ready for publication, and a two-page summary of the candidate's accomplishments and qualifications for the award. Selection will be made by the Pharmacia-ASPET Award Committee, appointed by the President of ASPET.

Nominations shall be accompanied by six (6) copies of each of the following:

1. Two (2)-page summary that details the importance of the candidate's work.
2. Each of six articles published or ready for publication by the candidate that have direct bearing on the Award.
3. Brief biographical sketch of the candidate.
4. Candidate's *curriculum vitae* and bibliography.

Nominations for this Award must be received no later than **September 15, 2005,** by the Executive Officer, American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, Maryland 20814-3995.

Winners of the ASPET Award for Experimental Therapeutics

1969	John A. Oates	1982	William H. Prusoff	1995	Henry I. Yamamura
1970	Joseph R. Bertino	1983	Marcus M. Reidenberg	1996	Robert F. Furchgott
1971	Elliot S. Vesell	1984	Sir James Black	1997	Michael M. Gottesman
1972	Francois M. Abboud	1985	Louis Lemberger	1998	Phil Skolnick
1973	Dean T. Mason	1986	Alan C. Sartorelli	1999	Yung-Chi Cheng
1974	Leon I. Goldberg	1987	Albrecht Fleckenstein	2000	Saloman Z. Langer
1975	Mackenzie Walser	1988	Jean-Francois Borel	2001	George R. Breese
1976	Louis Lasagna	1989	Benedict R. Lucchesi	**Became Pharmacia-ASPET Award in Experimental Therapeutics**	
1977	Allan H. Conney	1990	Albert Sjoerdsma		
1978	Attallah Kappas	1991	Theophile Godfraind	2002	Darryle D. Schoepp
1979	Sydney Spector	1992	James W. Fisher	2003	William C. DeGroat
1980	Sanford M. Rosenthal	1993	V. Craig Jordan	2004	Philip Needleman
1981	David G. Shand	1994	Susan B. Horwitz	2005	Donald McDonnell

GOODMAN AND GILMAN AWARD IN RECEPTOR PHARMACOLOGY

The Louis S. Goodman and Alfred Gilman Award in Drug Receptor Pharmacology, contributed by GlaxoSmithKline, was established to recognize and stimulate outstanding research in pharmacology of biological receptors. Such research might provide a better understanding of the mechanisms of biological processes and potentially provide the basis for the discovery of drugs useful in the treatment of diseases. The award is presented biennially in even years and consists of an honorarium of $2,500, a plaque, and travel expenses for the winner and spouse to the award ceremony at the ASPET annual meeting.

There are no restrictions on the nominees for this award. However, nominations must be made by a member of ASPET, and no member may nominate more than one candidate a year. The award is to be made on the basis of the research contributions described in published work or submitted manuscripts and a summary of those contributions described in the letter of the individual who nominates the candidate. Selection will be made by the Goodman and Gilman Award Committee, appointed by the President of ASPET.

Nominations shall be accompanied by six (6) copies of each of the following:

1. Summary that details the importance of the candidate's work.
2. Each of six articles published or ready for publication that have direct bearing on the award.
3. Brief biographical sketch of the candidate.
4. Candidate's *curriculum vitae* and bibliography.

Nominations for this Award must be received no later than **September 15, 2005,** by the Executive Officer, American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, Maryland 20814-3995

Winners of the Goodman and Gilman Award in Drug Receptor Pharmacology

1980	Solomon H. Snyder	1988	Ronald M. Evans	1996	Elliott M. Ross
1982	Pedro Cuatrecasas	1990	Alfred G. Gilman	1998	David Garbers
1984	Robert F. Furchgott	1992	Paul Greengard	2000	Melanie H. Cobb
1986	Robert J. Lefkowitz	1994	Jean-Pierre Changeux	2002	William B. Pratt
				2004	Lee E. Limbird

BERNARD B. BRODIE AWARD IN DRUG METABOLISM

The B. B. Brodie Award in Drug Metabolism has been established to honor the fundamental contributions of Bernard B. Brodie in the field of drug metabolism and disposition. The Award is presented biennially in even years to recognize outstanding original research contributions in drug metabolism and disposition, particularly those having a major impact on future research in the field. The B. B. Brodie Award is sponsored by the Division for Drug Metabolism, and funds to support the award come from members' contributions.

The award consists of a $2,000 honorarium, a commemorative medal, and travel expenses to the award ceremony at the annual meeting. A lecture, delivered by the awardee at the annual meeting, describing appropriate research accomplishments and their future direction, will be published in *Drug Metabolism and Disposition*.

There are no restrictions on institutional affiliation, and a candidate need not be a member of the Society. The only restriction for the Award is that supporting research accomplishments must not be used to win any other major award. Only one nominator is necessary, although more are acceptable, and the nominators need not be members of ASPET. Selection of an awardee will be made biennially by the B.B. Brodie Award Committee, appointed by the President of ASPET, with input from the Division for Drug Metabolism.

Nominations shall be accompanied by six (6) copies of each of the following:

1. Selections and comments on the outstanding papers.
2. Nominating letter and no more than five supporting letters detailing accomplishments of the nominee.
3. Brief biographical sketch of the candidate.
4. Candidate's *curriculum vitae* and bibliography.

Nominations for this Award must be received no later than **September 15, 2005,** by the Executive Officer, American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, Maryland 20814-3995.

Winners of the Bernard B. Brodie Award in Drug Metabolism

1978	James R. Gillette	1988	Wayne M. Levin	1997	Ronald W. Estabrook
1980	Minor J. Coon	1990	Daniel M. Ziegler	1999	Marion W. Anders
1982	Donald M. Jerina	1992	F. Peter Guengerich	2000	Bettie Sue Masters
1984	Gilbert J. Mannering	1994	Paul R. Ortiz de Montellano	2002	Erick F. Johnson
1986	Daniel W. Nebert	1996	Anthony Y.H. Lu	2004	Thomas L. Poulos

CALL FOR AWARD NOMINATIONS FOR 2006

P. B. Dews Award for Research in Behavioral Pharmacology

ASPET's Division of Behavioral Pharmacology sponsors the P. B. Dews Award for Research in Behavioral Pharmacology to recognize outstanding lifetime achievements in research, teaching and professional service in the field of Behavioral Pharmacology and to honor Peter Dews for his seminal contributions to the development of behavioral pharmacology as a discipline. The biennial award is supported by an endowment made possible by contributions from Aventis, Centre de Recherche Pierre Fabre, Eli Lilly, Harvard University, International Life Sciences Institute Caffeine Committee, Merck (San Diego), Pepsi Cola Company, Pfizer Central Research and Pfizer Global Research and Development, Pharmacia, Wyeth-Ayerst Research, and ASPET members.

The Award consists of $750, a plaque, and travel expenses to the award ceremony at the ASPET annual meeting. The recipient will be invited by the Chair of the Division of Behavioral Pharmacology to deliver a special lecture on this occasion. The lecture will be published subsequently in an appropriate ASPET-sponsored publication

There are no restrictions on nominees for this award. Nominations may be made by members of ASPET or of any relevant scientific society. Selection will be made by the P.B. Dews Award Committee, appointed by the President of ASPET with input from the Division for Behavioral Pharmacology.

Nominations shall be accompanied by six (6) copies of each of the following:

1. Description of the candidate's major contributions, including scientific, teaching and professional achievements.
2. Candidate's *curriculum vitae* and bibliography.
3. List of the candidate's trainees.
4. Each of five major publications.
5. Brief biographical sketch of the candidate.

Nominations for this Award must be received no later than **September 15, 2005,** by the Executive Officer, American Society for Pharmacology and Experimental Therapeutics, 9650 Rockville Pike, Bethesda, Maryland 20814-3995.

Winners of the P. B. Dews Award

2002 William H. Morse 2004 Joseph V. Brady

A Biography of Peter Dews

by **Jonathan Katz**

Peter Dews attended medical school at the University of Leeds, where he received his Bachelor of Medicine and Bachelor of Surgery degrees, and then joined the subdepartment of Pharmacology at Leeds, at the time headed by Professor W.A. Bain. His work at Leeds on the pharmacology of an extract of marijuana gave him an early appreciation of the difficulties in objectively studying the behavioral effects of drugs.

Dews also spent time with Burn in Oxford (1946) and with Gaddum in Edinburgh (1947) and came to the United States in 1948 when he was offered a two-year Research Fellowship at Burroughs Wellcome in Tuckahoe, New York. It was at Wellcome that he published his first paper (Dews, 1953) on the behavioral effects of drugs. He was shortly thereafter offered a Fellowship at the Mayo Foundation where he served from 1950 to 1952. He earned his Ph.D. in Physiology in the laboratory of Charles Code at the University of Minnesota, and for the next year he worked with Joseph Berkson in the Division of Biometry and Medical Statistics at the Mayo Clinic. His interest in statistical analysis and estimating error continued throughout his career and particularly flourished when he later turned his attention to behavioral toxicology.

Dews was hired to the post of Instructor in Pharmacology at Harvard Medical School in January 1953 by Professor Otto Krayer and spent the remainder of his academic career at Harvard. Krayer told Dews to call on B. F. Skinner in the Department of Psychology at Harvard University, who had told Krayer that he (Skinner) had techniques that would be useful in pharmacology. The results of that meeting were colorfully recounted by Dews at a meeting of the European Behavioural Pharmacology Society (Dews, 1997). Dews met briefly with Skinner and was then shown around the laboratory by Skinner's younger associate, C. B. Ferster. As Dews tells the story, he immediately felt at home in the laboratory, as he sensed that he had found what he had been looking for to objectively study

behavior. The functional character of the laboratory was more like a physiology or pharmacology laboratory than what he had expected from a psychology laboratory. The likely leading contribution to his comfort with the laboratory environment was the kymograph-like tracings of the cumulative recorders drawing records of behavior occurring in time, and in systematic relation to environmental events.

Dews, with some help from Ferster, immediately launched a course of studies of the behavioral effects of drugs (Dews, 1955a, 1955b, 1957, 1958; Wurtman et al., 1959). His initial experiments established that the schedule of reinforcement that maintained a repeating behavior could play a critical role in determining the effects of pentobarbital. Not only were the dose-effects of the drug different for the performances maintained under two different schedules of reinforcement, but there was actually a dose range at which the rate of behavior was increased under one schedule and decreased under the other; the effects of the drug were diametrically opposed depending on the schedule of reinforcement. Subsequent experiments investigated the effects of drugs on discriminatory performances and the behavioral effects of stimulants. In his work on stimulants, Dews discovered that "stimulant" drugs would increase the probability of behavior, as was assumed by the name of the loosely defined drug class. But also, and just as importantly, the drugs could decrease the probability of behavior; and whether the likelihood of the behavior increased or decreased depended on the probability (or rate) of the behavior that was obtained when the drug had not been administered. This "rate-dependency principle" had precedents in pharmacology (*e.g.,* Langer and Trendelenberg, 1964) and formed an important launching point for many subsequent studies of the behavioral effects of drugs by Dews and scores of others.

In the years that followed, Dews built a Laboratory of Psychobiology, first within Professor Krayer's Department of Pharmacology, and later in the Department of Psychiatry at Harvard. With the addition of William H. Morse, and later Roger T. Kelleher, the laboratory flourished. A steady stream of medical students and post-doctoral fellows spent a few years in the laboratory under the mentoring of one of the three principals before moving on to good positions elsewhere. The first and foremost subject of study was the effects of drugs on behavior. However, consistent with Professor Krayer's openness and willingness to entertain subjects normally thought to be outside the realm of pharmacology, the Laboratory of Psychobiology took on a wide variety of subjects of study. From within the Laboratory or through collaborations within the Harvard community, Dews and members of the Laboratory examined schedules of reinforcement as determinants of behavior, environmental influences on visual behavior (in collaboration with Torsten Wiesel), behavioral and environmental influences on cardiovascular function (with J. Alan Herd), substance abuse, and behavioral toxicology. Perhaps one of Dews' strengths in approaching the subject matter of behavioral pharmacology was that he was not formally trained in psychology. Early in his career he had declined suggestions that he study the behavioral effects of cannabinoids by examining rodents in mazes. Being "a mere pharmacologist" he was not constrained by psychological theory, which allowed him to objectively study behavior using techniques that appealed to him as an experimentalist. Most important to Dews was that behavior and the effects of drugs be studied using objective and quantifiable techniques, and that studies emphasized functional relations between independent and observable dependent variables. Dews also approached questions of fundamental pharmacological importance with the same objectivity that eluded others (see Woods and France, 2002). Characterizing all of his endeavors was a reliance on sound principles of behavioral and pharmacological science.

References

Dews, P.B. The measurement of the influence of drugs on voluntary activity in mice. *British Journal of Pharmacology* 8: 46-48, 1953.

Dews, P.B. Studies on Behavior. I. Differential sensitivity to pentobarbital of pecking performance in pigeons depending on the schedule of reward. *Journal of Pharmacology and Experimental Therapeutics* 113: 393-401, 1955 (a).

Dews, P.B. Studies on behavior. II. The effects of pentobarbital, methamphetamine and scopolamine on performances in pigeons involving discriminations. *Journal of Pharmacology and Experimental Therapeutics* 115: 380-89, 1955 (b).

Dews, P.B. Studies on behavior. III. Effects of scopolamine on reversal of a discriminatory performance in pigeons. *Journal of Pharmacology and Experimental Therapeutics* 119: 343-53, 1957.

Dews, P.B. Studies on behavior. IV. Stimulant actions of methamphetamine. *Journal of Pharmacology and Experimental Therapeutics* 122:137-147, 1958.

Dews, P.B. Why did behavioural pharmacology develop so late? *European Behavioural Pharmacology Society Newsletter*, June 1997.

Langer, S.Z. and Trendelenburg, U. Studies on veratrum alkaloids. XXXIX. Interaction of veratramine and accelerating agents on the pacemaker of the heart. *Journal of Pharmacology and Experimental Therapeutics* 146: 99-110, 1964.

Woods, J.H. and France, C.P. Determinants of the behavioral effects of opioids and their antagonists: Contributions of the Laboratory of Psychobiology. *Psychopharmacology*, 163: 406-411, 2002.

Wurtman, R.J., Frank, M.M., Morse, W.H. and Dews, P.B. Studies on behavior. V. Actions of l-epinephrine and related compouns. *Journal of Pharmacology and Experimental Therapeutics* 127: 281-287, 1959.

Division for Drug Metabolism

New Division Councilor Selected

Hollie I. Swanson, Ph.D., has been appointed to serve as a Councilor for the Division of Drug Metabolism. Dr. Swanson is an Associate Professor in the Department of Molecular and Biomedical Pharmacology, University of Kentucky Medical School. Dr. Swanson received her B.S. from South Dakota State University, M.S. from Oregon State University and Ph.D. from Purdue University. Her work focuses on elucidating the role of the aryl hydrocarbon receptor in cell fate decisions of epithelial cells and understanding how its inappropriate activation by drugs and xenobiotics lead to tumor promotion. Her professional activities include past membership on the AlTox-1 NIH study section, Councilor of the Molecular Biology Specialty section of the Society of Toxicology, past President of the Ohio Valley Society of Toxicology Regional Chapter and editorial board member of Toxicology and Applied Pharmacology. Her term will expire in 2008.

Drug Metabolism Division Best Abstract Award Winners at EB '05

The Division held its annual Best Abstract competition for presentations at Experimental Biology 2005 in San Diego, with the awardees listed below.

Graduate Student Division

First Place: **Mohamed A Abdelmegeed**, Wayne State University. *Acetoacetate inhibits cytochrome P450 (CYP) 2E1 mRNA through suppression of transcription and induces CYP2E1 protein through increased translation and decreased protein degradation in primary cultured rat hepatocytes*. Advisor: Raymond F. Novak

Second Place: **Xu Yang**, University of Washington. *Identification of 1α, 25-dihydroxyvitamin D3 as a novel endogenous substrate for cytochrome P450 3A4*. Advisor: Kenneth E. Thummel

Postdoctoral Division

First Place: **Xiuling Zhang**, New York State Department of Health. *Variable expression of CYP2A6 and CYP2A13 proteins in human lung and nasal mucosa*. Advisor: Xinxin Ding

Second Place: **Sanjoy Roychowdhury,** University of Iowa. *Visualization and quantification of intracellular protein adducts in human epidermal keratinocytes exposed to sulfamethoxazole (SMX) and dapsone (DDS)*. Advisor: Craig K. Svensson

Donations Requested for the Bernard B. Brodie Award

Under the leadership of Dr. James Halpert, the Division has launched a new initiative to raise funds for the Bernard B. Brodie Award in Drug Metabolism. Created in 1977, this award honors investigators who have made significant, life-time contributions to our knowledge of drug metabolism and disposition. The Division is responsible for raising funds to create an endowment to support this award, with a goal of $60,000. To date, approximately 2/3 of the needed funds have been donated. Contributions are tax deductible. If you would like to make a donation or to obtain more information on this effort, please contact Christie Carrico at ASPET (ccarrico@aspet.org).

Division for Toxicology

Officers for the Division of Toxicology

Chair	Marc Fariss
Chair-Elect	Jim Kehrer
Past Chair	Harihara Mehendale
Secretary-Treasurer	Jack Hinson
Secretary-Treasurer-elect	Alan Parrish
Past Secretary-Treasurer	Joan Tarloff

Division to Establish Post-Doctoral Best Paper Award

The Division of Toxicology is pleased to announce the institution of a post-doctoral scientist award similar to those awards already in place for graduate students. The post-doctoral award will be judged based on a submitted abstract, and individuals wishing consideration should look for an application form on the ASPET web site.

Graduate Student Best Paper Award

Graduate students wishing consideration for travel or poster awards should also look for check-off boxes when submitting abstracts for EB2006. Graduate student awards are based on both the submitted abstract and an interview at the student-mentor poster session on Sunday evening (April 2, 2006).

Graduate Student Awardees at EB2005

First Place**:** **Tanvi Modi** (University of Louisville), *Methionine Adenosyltransferase IIA (MAT IIA) activity and S-adenosylmethionine (SAMe) biosynthesis play a critical role in the survival of CD4+ cells by regulating Akt activation and FasL-mediated activation induced cell death (AICD)*. Mentor: Shirish Barve

Second Place: **Ankur Vijay Dnyanmote** (University of Louisiana at Monroe), *Role of diabetes-induced advancement of cell cycle in lower progression of DCV-initiated renal injury and survival*. Mentor: Harihara Mehendale

Third Place: **Robert J. Foxenburg** (University of Buffalo*), Kinetic data on organophosphate pesticide metabolism in humans to allow PBPK/PD models to assess risk.* Mentor: James R. Olson

Symposia

We have some excellent programming planned for EB2006. Although details are sketchy at the moment, we anticipate at least four symposia:

Sunday, April 2, 9:30 AM – 12:30 PM
Cellular and Molecular Pathways of Neurotoxicity: Relevance to Neurodegenerative Diseases - Jean L. Cadet

Monday, April 3, 9:30 AM – 12:00 PM
Targets of Toxicant Sensitivity in Aging - Harihara Mehendale

Tuesday, April 4, 3:00 PM – 5:30 PM
Therapeutics and Toxicology of COX-2 Inhibitors - Jim Kehrer

Wednesday, April 5, 8:30 AM – 11:00 AM
Response to Oxidative Stress by Specific Epithelial Cell Types - Phil Mayeaux

Symposia *Co-Sponsored* by the Division of Toxicology for EB'06 in San Francisco

Sunday, April 2, 3:00 PM - 5:30 PM
Metabolic Considerations in the Action of Herbal Medicines - Thomas K.H. Chang

What Regulates the Regulators? Factors that Alter Expression of the Nuclear Receptors Which Regulate Drug-metabolizing Enzymes - Allan B. Okey and D.S. Riddick

Tuesday, April 4, 9:30 AM-12:00 PM
Mood Stabilizers and Antidepressants: New Mechanisms for Old Compounds - De-Maw Chuang

Division of Toxicology Mixer

Our joint mixer (with the Division for Drug Metabolism) is tentatively scheduled for the evening of April 4. Award recipients, both graduate student and post-doctoral scientist awards, will be announced at the mixer.

Confirm your affiliation with the Division of Toxicology

Budgeting for each division is based on the number of primary and secondary members. If you're a member of ASPET with an interest in toxicology, please think about designating the Division of Toxicology as your primary or secondary division.

Graduate students and post docs with an interest in toxicology should also think about designating the Division of Toxicology as your primary or secondary division.

Why join a Division?

You can participate in creating the scientific program for the annual meeting.

You can network with people in your field at the mixers and divisional programming at the annual meeting.

You can participate in running the division and planning its activities, thereby play a role in running your society.

You get to meet all kinds of neat people.

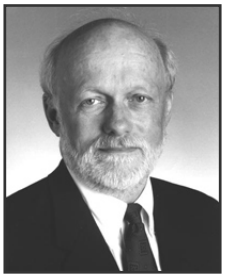
You get special notices and newsletters about items and activities of interest in your field.

It doesn't cost you anything to join a division, and you can belong to as many divisions as you would like.

If you would like to join a division, just send an email to rphipps@aspet.org

MEMBERS IN THE NEWS

Susan B. Horwitz, Ph.D., Rose C. Falkenstein Chair in Cancer Research and Associate Director for Drug Development at Albert Einstein Cancer Center, Albert Einstein College of Medicine, was one of 72 new members elected to the National Academy of Sciences in May. Dr. Horwitz is the co-chair of the Department of Molecular Pharmacology at Albert Einstein. She has been a member of ASPET since 1972. Dr. Horwitz discovered the mechanism of action of paclitaxel, ultimately paving the way for the use of taxol in the treatment of certain cancers. She is currently working on identifying cell replication inhibitors that are not subject to taxol resistance.



Palmer W. Taylor, Jr., Ph.D., Dean of the Skaggs School of Pharmacy and Pharmaceutical Sciences at the University of California at San Diego and former ASPET President, has received a 2005 Citation of Merit from the University of Wisconsin-Madison School of Pharmacy. Each year the School of Pharmacy awards University of Wisconsin-Madison Citations to a very few of its distinguished alumni. For 2005, there were four such alumni. These are individuals who have made significant contributions to pharmacy and society though research, teaching, or involvement in professional and/or community organizations. Only an honorary degree is a higher honor than a Citation.

Michael M. Iba, Ph.D. recently completed a two-day visit as a FASEB MARC Visiting Scientist at Albany State University in the Department of Criminal Justice & Forensic Science program. During his visit there, Dr. Iba lectured to the students and faculty on the topics, *Toxicology: The Science (Study) of Poisons* and *Nicotine and Lung Cancer*. He met with faculty and chairs of several other departments at Albany State, including Mathematics and Computer Sciences, Natural Sciences, Phychology-Sociology-Social Work, Business Information Systems, History-Political Science-Public Administration, as well as with the Associate Vice-President for Research and the Dean of the College of Arts and Sciences. Dr. Iba is Associate Professor of Pharmacology and Toxicology at Rutgers University-Busch Campus.

The FASEB MARC Visiting Scientist Program is funded by a grant from NIGMS. The program is open to individuals who are members of FASEB societies and attempts to facilitate visits of faculty from majority institutions to minority institutions for periods ranging from a few days to a few weeks. FASEB is always looking for interested individuals to participate in this program. If you are interested, contact Jacqui Roberts in the FASEB MARC office (jroberts@faseb.org).

Alfred G. Gilman, M.D., Ph.D., Chairman of Pharmacology at UT Southwestern Medical School since 1981, has been named Dean of UT Southwestern Medical School. He has been serving as interim Dean for a year, but this appointment makes him the chief academic officer of the institution. He will continue to oversee the Cecil H. and ida green Comprehensive Center for Molecular, Computational and Systems Biology as well as lead the Alliance for Cellular Signaling, the interdisciplinary research effort he initiated in 2000.

Staff News

Last issue we reported that ASPET's own Journals Director, Richard Dodenhoff, was playing the role of Dwight D. Eisenhower in the annual musical-satirical-comedy-revue production of Hexagon, *With Levity and Justice for All.* ASPET staff turned out in force for the event, sporting their 

buttons.

It is clear from this photo that a good time was had by all, and we anxiously await Rich's next foray into the theatre.

Regular Members

R. Michael Baldwin, PhD, University of California, Vet Medicine, Molecular Biosciences
Leslie R. Ballou, PhD, Dept of Veterans Affairs Medical Center, Research Service
William F. Bosron, PhD, Indiana University School of Medicine, Dept of Biochem and Molecular Biol
John R. Charpie, MD, PhD, Univ of Michigan Medical Center, Dept of Pediatrics
Alysia A. Chaves, PhD, Merck Research Laboratories
Richard B. Clark, PhD, University of Texas Medical School, Dept of Integrative Biology/Pharmacology
Pamela L. Crowell, PhD, Indiana Univ-Purdue Univ Indianapolis, School of Science
Maureen D. Donovan, PhD, University of Iowa, College of Pharmacy
Jilly F. Evans, PhD, Merck & Co.
Jawed Fareed, PhD, Loyola University Medical Center, Dept of Pharmacology
Jerome F. Fiekers, PhD, University of Vermont College of Med, Dept of Anatomy & Neurobiology
Harry A. Fozzard, PhD, University of Chicago, Dept of Medicine
Michael Freissmuth, M.D., Medical Univ of Vienna, Inst of Pharmacology
Stephen D. Hall, Indiana University School of Medicine
Michael A. Holinstat, PhD, Vanderbilt Univ Med Center, Dept of Pharmacology
J. Brian Houston, PhD, Univ of Manchester School of Pharmacy, Dept of Pharmaceutical Science
Zhiyuan Hu, PhD, Johns Hopkins University Sch of Med, Dept of Biochemistry
Tsuneya Ikezu, PhD, University of Nebraska Medical Center, Dept of Pharmacology
Philip B. Inskeep, PhD, Pfizer Inc., Global Research & Development
Douglas G. Johns, PhD, GlaxoSmithKline, Dept of Vascular Biology & Thrombosis
George F. Koob, PhD, Scripps Research Institute, Dept of Neuropharmacology
Dan L. Longo, M.D., National Institute on Aging, NIH
Gerard J. Marek, PhD, Eli Lilly and Company, Lilly Corporate Center
Mark P. Mattson, National Institute on Aging, Gerontology Research Center
David L. McKinzie, PhD, Eli Lilly & Co., Dept of Neuroscience Research
Gary W. Miller, PhD, Emory University, Center for Neurodegenerative Diseases
Philip Moos, PhD, University of Utah, Dept of Pharmacology & Toxicology
James S. Norris, PhD, Medical University of South Carolina, Dept Microbiology & Immunology
Travis J. O'Brien, PhD, George Washington University, Dept of Pharmacology & Physiology
Michael J. O'Neill, PhD, Eli Lilly and Company
R. Scott Obach, PhD, Pfizer, Inc., Pharmacokinetics, Dynamics & Drug Metabolism
Giovanni M. Pauletti, PhD, Univ of Cincinnati, College of Pharmacy
Alvaro Puga, PhD, University of Cincinnati Med Center, Dept of Environmental Health
Rajan Radhakrishnan, PhD, Western University of Hlth Sciences, Dept of Pharmaceutical Sciences
John J. Reiners, Jr., PhD, Wayne State Univ, Inst of Environmental Hlth Sciences
John D. Schuetz, PhD, St. Jude's Children's Research, Dept of Pharmaceutical Science
Philip C. Smith, PhD, Univ of North Carolina School of Pharmacy, Div of Drug Delivery & Disposition
Michael D. Southall, PhD, Johnson & Johnson, Preclinical Pharmacology
C. Ian Spencer, PhD, Johns Hopkins University, Div of Pulmonary & Critical Care Medicine
C. Michael Stein, M.D., Vanderbilt University School of Medicine, Division of Clincial Pharmacology
Dai N. Stephens, PhD, Univ of Sussex, Dept of Psychology
Courtney E.W. Sulentic, PhD, Wright State University, Dept of Pharmacology & Toxicology
Roger J. Summers, PhD, Monash University, Dept of Pharmacology
Mark Sussman, PhD, San Diego State University, Heart Institute and Dept of Biology
Hollie Swanson, PhD, University of Kentucky Medical Center, Dept of Molecular & Biomedical Pharmacology
Paul B. Watkins, MD, University of North Carolina, General Clinical Research Center
Jurgen Wess, PhD, NIDDK, NIH, Lab of Bioorganic Chemistry
Larry C. Wienkers, PhD, Amgen Inc., Dept of Pharmacokinetics & Drug Metabolism
Yongqin Zhang, PhD, Vanderbilt University Medical Center, Dept of Pharmacology

Affiliate Member

Rongde Qiu, USUHS, Dept of Pharmacology

Student Members

John A. Allen, University of Illinois College of Medicine, Dept of Physiology and Biophysics
Nagendra Venkata Chemuturi, University of Iowa, Dept of Pharmaceutics
Jacobi Cunningham, Boston University School of Medicine, Dept of Pharmacology & Experimental Therapeutics
F. Spencer Gaskin, University of Missouri School of Medicine, Dept of Medical Pharmacology & Physiology
Elizabeth Ann Hackler, Vanderbilt University, Dept of Pharmacology
Jeff Herman, Washington State University, Dept of Pharmacology
Chris W.D. Jurgens, University of North Dakota, Dept of Pharmacology
Ignacio Lizarraga-Madrigal, IVABS Massey University, Dept of Pharmacology
Sean O'Neill, Penn State University, Dept of Pharmacology
Nicolas Picard, Laboratoire De Pharmacologie, Faculté De Medicine
Ahmad Al Riyahi, University of Windsor, Dept of Biochemistry
Katharine M. Seip, Rutgers University, Center for Molecular & Behavioral Neuropharmacology
Jiping Xiao, Medical College of Georgia, Dept of Pharmacology & Toxicology

Undergraduate Student Members

Kiran Kumar, University of Arizona, Dept of Biochemistry and Molecular Biophysics
Amber Reed, Georgia Southern University, Dept of Biology/Biology Education
Taylor Robertson, Louisiana State University HSC, Dept of Pharmacology, Toxicology & Therapeutics
Sarah Statt, University of Arizona, Dept of Chemistry
Ryan Suda, University of California, San Diego, Dept of Pharmacology

Plan on attending the
15th World Congress of Pharmacology (IUPHAR 2006)
Beijing, China
July 2-7, 2006
http://www.iuphar2006.org

Photos left to right: The Forbidden City, the Great Wall, the Sacred Road
Photos courtesy of The Beijing Page (www.Beijingpage.com)

J. Bryan Smith, Ph.D.
1942 - 2005

J. Bryan Smith, former Chairman of Pharmacology and beloved faculty member at Temple University School of Medicine died at the age of 62 on Thursday March 24, 2005. He had appointments in both the Pharmacology Department and the Sol Sherry Thrombosis Research Center. He had recently retired and was living in Williamsburg Virginia with his wife Angela to be near his daughter's family.

Bryan received a B.S. degree in Chemistry from Graduate Salford University in 1968. He joined Gustav Born's Medical Research Council Thrombosis Research Group in the Department of Pharmacology at the Royal College of Surgeons, London, England (1968 – 1971), receiving his Ph.D. from the University of London in 1971. While at the University of London he was introduced to the platelet, a cell he would investigate for the rest of his career. During this time Bryan formed a friendship with David Mills, which he would maintain until the recent passing of David. In collaboration with Anthony Willis, Bryan made one of the seminal discoveries of his career. He was studying the effect of aspirin on platelets. Aspirin was known to be an inhibitor of platelet function. Bryan and Tony showed that aspirin blocked the ability of platelets to synthesize prostaglandins in response to platelet agonists. This study was published in *Nature New Biology*. In accompanying papers, similar observations were made in spleen and lung by others at the Royal College of Surgeons.

For his Postdoctoral Fellowship, Bryan decided to join the laboratory of Mel Silver at the Cardeza Foundation for Hematologic Research at Thomas Jefferson University in Philadelphia. Cardeza is one of the premiere Hematology Research Institutes. His intention was to stay in the United States for a short time and then return to England. Bryan enjoyed living in Philadelphia very much and decided to remain in the area.

His time at Cardeza was extremely productive and yielded well over 100 publications. During this period, he continued to work with Mel Silver, and he became a faculty member at Thomas Jefferson University. He collaborated on research projects with many investigators from local medical schools including Thomas Jefferson University, University of Pennsylvania, and Temple University. At this time Philadelphia was probably one of the most important research regions in the world for the study of platelets and problems related to thrombosis. Collaborators included Alan Lefer, K.C. Nicolau, Holm Holmsen, Robert Colman, Stefan Niewarowski and Koneti Rao, just to mention a few of those in Philadelphia. He also collaborated widely with investigators throughout the world.

Bryan was ranked the 103rd most cited scientist for the period of 1973-1984. This work was almost exclusively on prostaglandins and thromboxanes, with most of the studies being on platelets. In 1982 Holmsen decided to return to Norway, and Bryan was recruited by Bob Colman to replace Holm as the Assistant Director of the Thrombosis Research Center. Bryan immediately became a central figure in the platelet studies at the Thrombosis Center. With David Purdon, he began detailed studies on the metabolism of arachidonic acid and other lipids in the platelet. Gerard Mauco came to his laboratory for a sabbatical, and along with Carol Dangelmaier, who was inherited from Holm, they showed that phosphatidylinositol was the primary source of arachidonic acid liberated in platelets. Mary Selak joined Bryan's laboratory in 1985 and along with Michel Chigard, also on sabbatical, began a study of the interactions between neutrophils and platelets. They found that cathepsin G released from neutrophils was a good platelet agonist. One of us (JD) became interested in Bryan's research and we began a long collaboration. We developed methods to measure inositol trisphosphate in platelets that did not require long incubations. This work led to several important papers defining the role of IP3 in agonist dependent signaling and, in particular, ADP-dependent platelet activation.

In 1987, Bryan, along with other well-known local pharmacologists including Warren Chernick, George Koelle, Jay Roberts and Paul Bianchi, co-founded the Mid-Atlantic Pharmacology Society (MAPS), which has since become a constituent chapter of ASPET. At about this same time, Bryan became the chairman of the Pharmacology Department at Temple University School of Medicine. For the next several years Bryan played an integral role in MAPS by serving as host for several meetings and continuing to support its development. In 2001 the society awarded Bryan the George B. Koelle award in recognition of his contributions to pharmacology.

The last phase of Bryan's research career was devoted to investigating the signaling mechanisms for platelet collagen. He demonstrated that collagen signaling leads to intracellular Ca^{2+} mobilization, a finding that ran counter to the current theory of the time. He also explored snake venoms in his efforts to find an inhibitor of collagen-platelet interactions and discovered a new protein that he called Catrocollastatin. In total, Bryan published over 200 papers.

In addition to being a scientist, Bryan was devoted to his wife Angela and their two children Suzanne and Timothy. He liked to be active and enjoyed tennis and played with Jan Willem Ackerman during his sabbatical in Philadelphia. He and Angela started to play golf, and part of his reason for enjoying Williamsburg was because of the numerous golf courses in the area. As chairman of Pharmacology, he hosted a number of social events at his house; most will remember the annual Department picnic, which allowed everyone to show their ineptitude at sports.

Angela has supplied several amusing stories about Bryan, some of which will be remembered by the many who knew him. When discussing his work on snake venoms as collagen antagonists he said with a chuckle, "We're also considering a snake in Florida - the C-Atrox. It comes in two versions - the Texan and the Oklahoman. We picked the Texan because it's easier to spell."

On one occasion, at a party at his house, he led some of the guests out to his backyard where a light was shining in one corner on chickens housed there to raise antibodies to prostaglandins. After selecting four healthy birds and raising them for a month or two, Bryan wondered why he wasn't getting any eggs. It turned out that they were roosters.

In a final story, Matteo Russo from La Sapienza in Italy gave Bryan some "special" urine to bring back to the states one August. Unfortunately, Bryan was detained in the Airport for hours during an Italian Bank Holiday, and by the time he got onto the plane, everyone in the terminal was sniffing at the ghastly smell wondering where it was coming from.

Bryan combined science, humor and administrative skills in a manner that gained him admiration and respect from his peers and students. All those who knew him will fondly remember him.

Prepared by Barrie Ashby, James L. Daniel from Temple University School of Medicine and Jan M. Kitzen from Wyeth Research

ASPET notes with sympathy the passing of the following members:

C. Jelleff Carr

Francis F. Foldes

L. Meyer Jones

Seymour S. Kety

Philip A. Lief

Ade T. Milhorat

Paul L. Munson

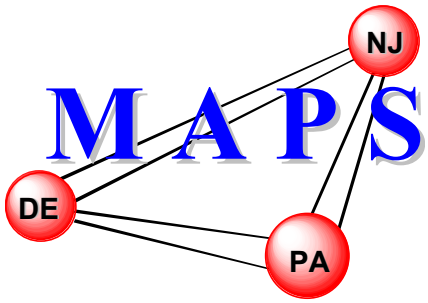
Hugh A. Pritchard

J. Bryan Smith

Isaac Starr

Philip G. Watanabe

Rene W. Wegria



MID-ATLANTIC PHARMACOLOGY SOCIETY
2005 MEETING ANNOUNCEMENT!!

Theme:
"Chemical Biology: New Targeted Approaches to Cancer Therapeutics"

Keynote Speaker:
Dr. Stuart Schreiber
"Rethinking the Process of Drug Discovery: Linking Genotype to Phenotype with Small Molecules"

Location:
The Wistar Institute
Philadelphia, PA

Date: October 28, 2005

The Abstract Submission and Advance Registration **Deadline** for the 2005 Meeting is **30-Sept-2005**!

For registration and abstract submission info, please contact either Ms. Jeanne Coughlin (215-707-5227; jeanne.coughlin@temple.edu) or Dr. Hugo Vargas (215-652-8829; hugo_vargas@merck.com)

Program, Abstract & Registration Forms will be available soon on the MAPS Webpage: http://www.aspet.org/public/chapters/maps_chapter.htm

MEMBERSHIP INFORMATION

Definitions of Categories of ASPET Membership

Regular Members: "Any qualified investigator who has conducted and published a meritorious original investigation in pharmacology shall be eligible for membership in the Society." - Bylaws Article II, Section 1, Item 1. An individual who holds an earned doctoral degree (Ph.D., M.D., or equivalent) is considered a qualified investigator. (Exceptions may be made for someone who does not meet the degree requirement but who has made major original research contributions to pharmacology.)

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- Present independent papers at all Society meetings.
- Sponsor a paper for a non-member at all Society meetings.
- Nominate candidates for membership.
- Vote on all Society ballots and may hold elected office in the Society.
- Have access to the *members only* portion of the ASPET Web site (www.aspet.org).
- Are listed in the FASEB directory.
- Will have free online access to all back issues of ASPET Journals.
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All Society Members qualify for the following reduced publication subscription rates:

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Application Instructions and Suggestions

Submit a typed original and one (1) copy of the completed Application for Membership form or use the online application form on the ASPET web site at http://www.aspet.org/membership. Submit a current curriculum vitae including bibliography for Regular and Affiliate Membership. You may e-mail the CV.

Sponsor Statements: Submit signed statement(s) of qualifications of the applicant from two Regular Members of ASPET for Regular Membership and from one Regular Member of ASPET for Affiliate Membership and Student Membership (Affiliate Members may also sponsor student applicants). In addition to statement certifying that the applicant is qualified for ASPET membership, sponsors please provide your own current address, phone, fax and email. **It is the responsibility of the applicant to secure these documents.**

ASPET
American Society For Pharmacology and Experimental Therapeutics

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Application for [ ] **Regular**, [ ] **Affiliate**, [ ] **Graduate Student**, or [ ] **Undergraduate Student**

Year: ○ Fr ○ Soph ○ Jr ○ Sr

APPLICANT: Please complete this section – type if possible.

Name and Address:

Telephone:

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Date of Birth:

Education and Training:

Date and Degree	School	City/State/Country	Major Field

Professional Experience (Present position first) Please include dates, position, and organization.

Indicate primary (1) & as many secondary (X) divisions to which you wish to belong

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___Division for Cardiovascular Pharmacology
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___Division for Toxicology

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1. Application form.
2. Statement and signatures from two sponsors for Regular membership and from one sponsor for Affiliate and Student membership. A letter or e-mail message may be sent by the sponsor to the Membership Coordinator (rphipps@aspet.org) in lieu of the sponsor's signature and statement of qualifications of the applicant on this form.
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Experimental Biology '06
San Francisco, CA
Saturday-Wednesday
April 1-5, 2006
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Washington, DC
Saturday-Wednesday
April 28-May 2, 2007
(AAA, APS, ASIP, ASBMB, ASNS, ASPET)

🏆 ASPET's Centennial 🏆
Experimental Biology '08
San Diego, CA
Saturday-Wednesday
April 3-9, 2008