Lwoff said, "We have gone from zero to the condition of movie stars. . . . Our lives are completely upset." However, most scientists develop efficient responses to requests. Francis Crick sends out a standard checklist turning down "your kind invitation" to do any of sixteen activities.

Zuckerman used the annual number of published papers as a measure of how a sciicientist's work is affected by receipt of a Nobel Prize. She found that average publication frequency dropped from six papers a year prior to receipt of the prize to four papers afterward. Comparison with a matched control group showed that the decrease could not be explained by increased age, and that even after winning the prize the laureates published twice as much as the control scientists.

In addition to the disruptive influence of winning the Nobel Prize, many scientists are upset because they do not consider the prize-winning contribution their best work. Nearly half the laureates Zuckerman interviewed said had they given themselves the prize, it would have been for something else. Some scientists felt their theoretical work was more important than the recognized empirical contribution. Others were upset the recognition came for a chance discovery. "Anybody could have done that," one laureate said.

Zuckerman believes that the Nobel Prize now is an elaborate social arrangement for identifying scientific excellence in a few symbolic cases. But she concludes, "We do not yet know whether the prizes have advanced science or significantly affected its directions of development." □

Learned response pinned to brain cells

At the tone, the rabbit slips a protective membrane over its eye. It has learned that the sound is usually followed by an unpleasant puff of air. Somewhere in the brain, nerve cells have been altered by the rabbit's past experience.

To discover how cells change during learning, biologists must first determine which cells are involved. Richard F. Thompson reported to the annual meeting of the National Academy of Sciences in Washington last week that he and colleagues have identified neurons that participate in recognizing an association between the events in classical conditioning. Those cells then influence other parts of the brain. Now further research can focus on those neurons, the pyramidal cells of the hippocampus.

The rabbits' blink is the American answer to Pavlov's dogs' salivation response, says Thompson of the University of California in Irvine. Thompson and colleagues looked to the hippocampus, a folded layer of cells deep inside the brain, for the substrate of conditioned learning. A wide variety of experimental and clinical situations have implicated the hippocampus in learning and memory.

Thompson first recorded the signals of small groups of nerve cells. He found that activity increases when the tone and the air puff are presented as linked events. The activity is not increased by the air puff and tone when they are not part of a conditioning sequence.

The response in the hippocampus appears far earlier than the conditioned behavior of the eyelid (the nictitating membrane). Sometimes the hippocampal activity is apparent by the second training trial. "It is perhaps the earliest sign of training," Thompson says. "The hippocampus has learned that something is about to happen."

Thompson has also traced the signs of training to a subsequent brain region. Neurons of the hippocampus send processes to the lateral septum, but not to the medial septum. Thompson finds an increased activity in the lateral septum in response to paired, but not unpaired, tones and air puffs. The medial septum, which sends processes into the hippocampus but does not receive hippocampal output, shows no response to paired stimuli. Increased activity appears in the lateral septum after its rise in the hippocampus.

The learning-related activity in the hippocampus originates in just one class of nerve cells, recent experiments by Theodore Berger and Thompson indicate. Research, which is reported in the March PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, implicates the pyramidal cells, neurons that carry information out of the hippocampus. At least 75 percent of the pyramidal cells in the areas studied show increased activity during training. Another class of neurons was found to decrease their activity during the conditioning. Thompson believes that the pyramidal cells will be found to be the basis not only for the rabbits' tone-blink response, but also for Pavlov's dogs' salivation after hearing a bell and for other conditioned reflexes. □

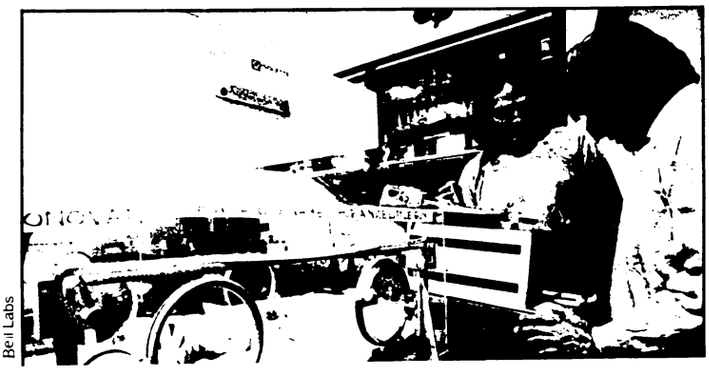
Bilirubin in babies: A better test

The liver is the body's dump and detoxification center. But the developing liver of a newborn can't always handle the load imposed by a rapidly growing, changing body. Toxic products back up in the blood stream. About 10 percent of babies, including most that are born prematurely, can't excrete enough of the body's bilirubin, a breakdown product of hemoglobin, the coloring and oxygen-carrying molecules in red blood cells. If too much bilirubin accumulates in the blood, it oozes into the body tissues and causes jaundice. More serious, it also seeps into the baby's brain and causes irreversible damage. High bilirubin levels have also been associated with the occurrence of crib death (SN: 4/15/78, p. 234).

Researchers at Bell Telephone Laboratories have developed a new quick and easy test based on fluorometric analysis that gives more, and perhaps more critical, information than the fast tests now available. The currently used quick tests only measure total bilirubin. Dr. Angelo A. Lamola reported at the recent annual meeting of the Society for Pediatric Research in New York City that the new, five-minute test not only measures total bilirubin, but also determines how much more of it the blood can safely carry.

Bilirubin latches onto albumin, a serum protein. When the bilirubin overloads the albumin, the trouble begins. The excess bilirubin crosses the blood-brain barrier and does the damge. The new test measures how much reserve albumin there is for bilirubin to bind. If the albumin is completely overtaxed, the baby may require a complete blood transfusion. Other tests can also give this information, but they take 10 times longer and involve complex chemistry.

The technique capitalizes on the fact that when bilirubin is either bound to blood albumin or treated with a detergent, it will fluoresce green light when exposed to blue light. This light can be captured and measured. Three drops of blood are needed for the test. One drop is measured to determine how much bilirubin is bound to albumin. Another drop is treated with detergent to measure total bilirubin. The third is combined with excess bilirubin to measure any previously unoccupied albumin in the blood sample. This technique is already used to measure lead levels in blood as a test for lead poisoning. □



Bell Labs

A hemato-fluorometer helps determine risk of brain damage to jaundiced infant.