

# life sciences notes

## ECOLOGY

### Owls heirs to fortune in rats

The question of what to do with the rest of the rat whose pituitary or other glands have been removed for study has been solved with finesse by researchers at the CIBA research laboratories in Basle, Switzerland. They feed them to owls.

Wildlife managers in the Toess Valley in eastern Switzerland are trying to reverse the decline in populations of several threatened species of owl. They are using breeding pairs from the Arth-Goldau animal park to attempt to raise young in captivity for restocking the valley.

But owls are very finicky eaters. The offer of the CIBA scientists of "spare rats and mice" therefore was welcome. Not only do the animal carcasses make ideal owl baby food, but they approximate closely the kind of wild food the owls will have to get used to upon their release in the valley.

## PRIMEVAL SOUP

### Sulfur-containing amino acid synthesized

The amino acid methionine has been synthesized under conditions simulating those existing before the appearance of life on earth. Until now methionine and other sulfur-containing amino acids have resisted synthesis under prebiotic conditions. This situation left a significant gap in the overall picture of how life developed.

Drs. Gary Steinman of Pennsylvania State University and Adolph E. Smith and Joseph J. Silver of Sir George Williams University in Montreal report in the March 8 *SCIENCE* that ultraviolet irradiation of an aqueous solution of ammonium thiocyanate results in the formation of a small amount of methionine.

Ammonium thiocyanate has been reported in the exhalations of volcanoes. It has been synthesized by causing an electric spark in a mixture of ammonia, methane, water and hydrogen sulphide (another volcanic gas). Ammonium thiocyanate has been studied before by workers attempting prebiotic-type syntheses of amino acids; the current report suggests that the low yield (less than one percent in this experiment) may have eluded earlier analytic techniques. Paper chromatography was used in this case.

## NUTRITION

### Germ-free animals undernourished

Axenic or germ-free mice, used widely in experiments because it is believed they introduce no variables, may be so undernourished as to affect the outcome of the experiments.

A Pennsylvania State University pathologist, Dr. Richard L. Naeye, in a report given to a meeting of the International Academy of Pathology in Chicago, says that 136 commercially produced axenic mice averaged 55 percent of the weight of 136 control mice of the same age. Organs of the mice such as lungs, heart, kidneys, adrenals, spleen, thymus and brain were found individ-

ually to be underweight. Cells of such organs, while normal in number, were of smaller than normal size.

Dr. Naeye believes the malnutrition may be the result of autoclaving of food for the mice, which may destroy some of its nutritive value. In addition axenic animals lack the intestinal bacteria which normally manufacture a number of vitamins, and this may complicate their ability to withstand the abnormal diet.

Because of the abnormal condition of some axenic mice, Dr. Naeye says, "users of such animals should consider the impact of such under nutrition on their data."

## REJECTION

### Passenger lymphocytes may cause rejection

Lymphoid cells transplanted with an organ as passengers appear to be important stimulators of the graft recipient's rejection reaction. Careful removal of such cells before transplant therefore may be clinically valuable, a report in the March 15 *SCIENCE* says.

Drs. William L. Elkins of the University of Pennsylvania and Ronald D. Guttmann of Harvard Medical School report that they injected donor spleen cells beside freshly transplanted kidneys in rats. These cells apparently were immunologically stimulated by circulating recipient leukocytes, and the interaction between the two cell populations produced damage to the transplanted kidney's parenchymal cells.

The damage observed was produced by an invasion of lymphocytes typical of organ rejection reactions. It has long been known that transplanted tissues do not sensitize their hosts as long as they are contained within a cell-impermeable membrane, as is the kidney. Therefore, the researchers suggest, the typical invasive reaction of rejection may frequently be initiated by passenger lymphocytes' interaction with host leukocytes.

## IMMUNOLOGY

### Single cell may produce two antibodies

Researchers at the University of Cincinnati report data that suggest a single cell type is able to produce two antibodies of different specificities.

Drs. J. Gabriel Michael and Robert Marcus report in the March 15 *SCIENCE* that they immunized mice with red blood cells taken from sheep and artificially coated with an antigen derived from the bacterium *Escherichia coli*. Subsequently they noted that the immunized animals exhibited secondary immune response to both *E. coli* and sheep erythrocytes injected separately. Tests suggest that cells of a single variety in the mouse spleens form both antibodies that attack the bacteria and antibodies that dissolve the walls of the red blood cells.

These spleen cells accounted for 38 percent of the secondary immune response to *E. coli* and 4.6 percent of the secondary response to blood cells.

The researchers say present data indicate that the antibodies are of two distinct varieties, rather than being one kind of substance capable of reacting with both blood cell and bacterium.