Xi of Northwestern University on "Power Sites in the Missouri River Basin."

UNDER a plan of exchange speakers the Iowa and Missouri Chapters of the Society of Sigma Xi have cooperated this winter. Professor A. G. Hogan, of the University of Missouri, addressed the Iowa Chapter at its first soirée on December 14, discussing "Nutritional Deficiency Diseases." On March 31, Dean George F. Kay, of the University of Iowa, addressed the Missouri Chapter on "Glaciation: the Background of Mississippi Valley Development." At the annual election of the Iowa Chapter of the Society of Sigma Xi new officers for the 1933–1934 period were named. Professor Henry A. Mattil succeeds Professor J. H. Bodine as president; Professor Norman C. Meier succeeds Professor John A. Eldridge as vice-president; Professor E. P. Tyndall succeeds Professor A. C. Tester as secretary; Professor Roscoe Woods completes a two-year term as treasurer. The society has sponsored a program of exchange speakers and soirées conducted by the College of Medicine, the College of Engineering, the department of mathematics, and the department of geology. Professor J Harlen Bretz addressed the society on February 15, on "The Grand Coulee," at the soirée conducted by the department of geology.

ANNOUNCEMENT is made that Sir Henry Dale, director of the National Institute for Medical Research of England and a leading authority on pharmacology, will be the principal speaker at the dedication of the new Merck Research Laboratory, to take place at Rahway, New Jersey, on April 25. Dr. Dale will be welcomed by the following guests of honor, who have accepted invitations to be present on the occasion of the formal dedication: Representing chemistry and the chemical industry, Lammot du Pont, president of E. I. du Pont de Nemours and Co., Inc., chairman of the Board of General Motors, Inc., president of the Manufacturing Chemists' Association; representing pharmacy and the pharmaceutical industry, J. K. Lilly, chairman of Eli Lilly and Company; representing medicine and the Public Health Service, Surgeon General Hugh S. Cumming, of the United States Public Health Service. The State of New Jersey will be represented by Governor A. Harry Moore. Over three hundred leaders in medicine and chemistry of the country will be present at the dedication.

The Johns Hopkins Alumni Magazine reports that a gift of $6,000 for the continuation of Dr. J. J. Abel's work on the pharmacology and chemistry of insulin has been received from the Commonwealth Fund.

Museum News states that the University of Richmond, Richmond, Virginia, will open a museum of biology in April. The museum will be housed in the new biology building of the university. It will occupy a room 34 by 40 feet with high windows so that 7-foot cases can stand beneath them, a room equipped with steel herbarium cases, and a room with 150 glass top insect cases in special cabinets and display cases. The case equipment is of bronze and plate glass by Russell. In addition, display cases will be set up in the halls and in each of the laboratories, and there will be a room with 24 cages for live animals, 22 aquaria of 12 to 200 gallons capacity, and a greenhouse on the roof. Other material besides the biological exhibits will also be shown in the museum. The building in which the museum is housed is three stories high, of brick and concrete, and includes lecture rooms, store rooms and the library of the department of biology with 500 feet of book-shelf space. Dr. John Wendell Bailey, professor of biology, is in charge.

DISCUSSION

NAMING THE GRAND CANYON

THERE seems to be some uncertainty in the public mind as to when the Grand Canyon was named and who named it. The first Spaniards to see it were members of a scouting party of the Coronado expedition in 1540 under Don Garcia Lopez de Cardenas, but, so far as the available records go, no name was then given to the great chasm. It was more than three centuries after this discovery by Cardenas that the canyon came into common knowledge though still with no name.

At last, in 1858, Lieutenant Ives and Professor Newberry wrote of it as the "Big Cañon" and the "Great Cañon." Then came Major Powell, in 1869, who was the first to explore its depths by descending through it in rowboats and he called it the "Grand Cañon."

In 1871 and 1872 Major Powell made a second descent of the Green and Colorado rivers. His report, published after this, spoke of it as the Grand Cañon (the Englished spelling "Canyon" was adopted later). The name was not recorded on any map till his topographers (of whom I was one) produced the first preliminary map of the region in the winter of 1872–73 in a tent in Southern Utah.

On Powell's first (1869) trip through the Grand Canyon it was not yet definitely named by him. John C. Sumner, one of his most active and intelligent men, says in a narrative he later wrote:

About fifteen miles below the Little Colorado the first bad rapid occurs in what I wanted to name Coronado Canyon. Major Powell told me it should bear my name if he got through and ever had the opportunity to place it on the Government map. Well, he got through all right, but forgot his vows and named it Grand Canyon.

There is no doubt whatever that the Grand Canyon was named by Major Powell not long after he came out of it on his 1869 trip.

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THE REACTION OF INDIVIDUAL BACTERIA TO IRRADIATION WITH ULTRA-VIOLET LIGHT

STUDENTS of the effect of ultra-violet light on bacteria have commonly accepted absence of multiplication, tested by clouding of broth or by colony formation, as the criterion of bactericidal action. This is a convenient but arbitrary endpoint, for "death" is not necessarily coincident with failure to multiply.

Observations on single organisms (*B. coli communis*) in the first hours after irradiation with measured monochromatic light, λ 2377 to 3022, show that there is a wide reaction zone between the behavior of cells which are not visibly affected and those which seem to be killed outright by the exposure. Single organisms which apparently have been unaffected grow and divide regularly on the surface of nutrient agar, producing typical colonies of normal-looking bacteria that ultimately coalesce into a confluent growth. Organisms which are exposed to quickly lethal doses show no increase in size and no cell division, but soon lose their high refractility, become beaded or irregularly refractile and degenerate into ghosts or shadows which are undoubtedly dead. In the intermediate zone between these two extremes the irradiated organisms present a remarkable picture. They increase in size, especially in length, without apparent inhibition, but do not divide when the normal adult stage is reached; so that long filaments of clear, highly refractile protoplasm are formed that look like spaghetti and may attain measured lengths of 50 to 150 microns. The transverse diameter is 1 to 3 times that of normal bacteria. These long forms are actively motile in a fluid medium, progressing with a sinuous motion, or drilling back and forth like spirochaetes. In 2 to 4 hours at 37.5° C the cells reach a limit of individual growth, forming long rafts of parallel filaments on an agar surface. Then cell division or degenerative changes begin. (1) The long cells may undergo a gradual degeneration, with loss of hyaline refractility, beading and ghost formation. (2) They may divide by cross fission into a number of large or small units, which then degenerate without further growth. (3) One or more normal-looking daughter cells may pinch off at one end and multiply rapidly to colony formation. The rest of the filament follows courses 1 or 2 above. Daughter cells have not been observed to form filaments; the reaction is limited to cells directly exposed to ultra-violet light.

Here is an apparent separation of two coordinate functions commonly essential to life. Cell division is regulated by a mechanism which is much more sensitive to wave-lengths below 3,000 than is the concomitant function of growth. By appropriate exposures the one can be temporarily or permanently suppressed, while the other proceeds for hours without hindrance. Ultimately, however, a limit is reached, and unless the division mechanism is restored the cell degenerates. A further study of this cell reaction is in progress.

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LACTOBACILLI IN FROZEN PACK PEAS

MICROBIOLOGICAL analyses of frozen pack peas held in storage from 1 to 26 months show that lactic acid bacteria tolerate well cold storage temperatures. The peas under consideration, representing several batches, were packed in a variety of ways—blanched and unblanched, dry and in brine, in 1 pound paper containers, and in No. 2 tin cans both vacuumized and unvacuumized. The storage temperature in most cases was 15° F., though some containers of the current year's pack were held at minus 5° F.

Some 40 samples from the different packs have been studied from the spoilage view-point alone, the containers being held at ordinary room temperature for 2 to 7 days, at the end of which time the contents were analyzed bacteriologically. Without exception the peas presented a bleached appearance and had a sour odor. Those in tin had developed more or less pressure in the container. The clouded liquors gave positive ferric chloride tests for lactic acid. Acidities of 1.0 to 1.3 per cent., calculated as lactic acid, were found, and the pH values ranged between 4.2 and 4.6. Direct microscopic examination invariably showed gram-positive rods, and medium-sized gram-negative rods were often present, but in smaller numbers. Appropriate cultural technique yielded the *Aerobacter aerogenes* ("colon") type and lactobacilli.

Study of 15 cultures of the lactobacilli isolated places the majority with the *Lactobacillus cucumeris* type, since they ferment arabinose and trehalose in addition to sucrose, dextrose and maltose. Inoculation of pure cultures of these into sterile peas yielded products entirely similar to the fermented frozen pack peas as regarded appearance, sauerkraut-like odor and acidity.