News of Science

Hydrogen Emissions from Distant Galaxies

David S. Heeschen, astronomer at Harvard University, has announced the first detection of hydrogen emissions from very distant galaxies. Using the Harvard Observatory's 24-foot radio telescope, he has found hydrogen emissions from the Coma cluster of galaxies, 75 million light years from the Milky Way, the earth's star group.

Through study of hydrogen radiations from galaxies, astronomers can gain new data bearing on the evolution and structure of the cosmos. The amount of gas in a galaxy is believed to bear a relation to the galaxy's age.

The invisible clouds of neutral atomic hydrogen in our galaxy and in others emit radiations of 21-centimeter wave length. Heeschen found that the 21-centimeter radiations from the Coma cluster shifted in frequency according to the expected red shift. (The farther away the source, the more the waves are shifted toward longer wave lengths.)

Small radio telescopes are not powerful enough to be of great help in such research. But the Harvard Observatory's new 60-foot telescope—Heeschen was speaking at its dedication—will provide much more power. The findings gained will be of great importance for knowledge of the evolution of the universe.

Secondary-School Enrollments

The AAAS Science Teaching Improvement Program has issued a report on secondary-school enrollments in the 2-year period 1953–55. The study involved 1.15 million students in 39 states and 80 school systems. It is hoped that the results are representative of the situation in the country as a whole, for if this is so, the downward trend in science and mathematics enrollments has ceased and enrollments in these courses are increasing at a faster rate than total enrollments.

Science enrollments showed slight annual increases in 47 school systems in both 1954 and 1955, rising in 1955 to 55.8 percent of the year's enrollment. In 1953 the mathematics enrollment in these same school systems was 50.4 percent of the total enrollment (470,477 students), and in 1955 the percentage rose to 51.6 percent (494,947 students). These increases were in addition to an over-all increase in enrollments of 5.2 percent (24,470 students) during the 2-year period.

Of the 80 school systems, those that showed the greatest increase in science enrollments in 1955 over 1953 are Little Rock, Ark., which had a 33.5 percent increase within a student population of 2593; Muncie, Ind., 47.6 percent increase and 1870 students; Fort Thomas, Ky., 39.2 percent increase and 400 students; Bangor, Me., 33.6 percent increase and 486 students; Oneida, N.Y., 56.3 percent increase and approximately 250 students; Grand Rapids, Mich., 50.5 percent increase and 645 students; and Platteville, Wis., 52.7 percent increase and approximately 500 students.

The schools that had a large percentage of increase in mathematics enrollments included Midwest City, Okla., 86.7 percent increase and 790 students; Belleville, Ill., 79.6 percent increase and approximately 1500 students; Opelousas, La., 48 percent increase and 486 students; Tampa, Fla., 43.7 percent increase and approximately 2000 students; Omaha, Neb., 35.7 percent increase and approximately 1500 students; Fort Thomas, Ky., 34.9 percent increase and 400 students; New Albany, Ind., 32.1 percent increase and approximately 1800 students; and El Centro, Calif., 30.3 percent increase and 1080 students.

Nine of the 80 school systems reported a decrease in the number of science enrollees between 1953 and 1955. The decreases ranged from 3 fewer students in Harrisburg, Pa., to 583 fewer in Philadelphia, with a total enrollment decrease of 899 science students.

Ten of the 80 school systems reported a decrease in the number of mathematics students. The total decrease was 1290 mathematics students; this loss ranged from 655 less in New York to one less in Beloit, Wis.

Only 14 schools sent data on enrollments in individual science courses, and in these the total enrollment increased by 8.4 percent during the 2 years. The percentage of those taking biology was the same in 1955 as in 1953, but physics enrollments increased by approximately 17.5 percent, chemistry enrollments increased by 22.4 percent, and general science enrollments increased by 24.1 percent. Although the number of students (122,673) is small in this group, it is interesting that physics, chemistry, and general science enrollments rose more than twice as fast as total enrollments, while biology held its 1953 position.

In mathematics, geometry enrollments in 8 schools were up an average of 12.4 percent, trigonometry enrollments in 4 schools were up 17.9 percent, and in all 14 schools algebra enrollments were up an average of 29.6 percent. While these reports indicating small increases in the percentages of secondary-school students interested in science and mathematics are encouraging, it is obvious that much remains to be done if the anticipated scientific-personnel needs of the next decade are to be met.—I.E.W., J.R.M.

Legendary Thai Tribe

A tribe of Thai nomads that were formerly thought to be only legendary were found by an American Museum of Natural History expedition that has just returned from Thailand. The group, which was led by Robert W. Weaver, spent more than 2 years in the interior of Thailand making a survey of the distribution of the minor ethnic groups that inhabit the remote wilderness areas. Weaver was accompanied by geographer Thomas L. Goodman, a Thai interpreter, and several bearers. Elephants, ponies, and donkeys were used to help carry equipment.

Weaver reports that the high point of the trip was the meeting with the Phi Thong Luang, or the "Spirits of the Yellow Leaf." The expedition had heard many tales about a strange tribe of nomads whose women had never been seen and who were able to fade away at the approach of hunters. These primitive people earned their name because it was believed that they deserted their lean-tos when the leaves used as cover turned yellow. After many weeks of walking through hot, arid bamboo thickets and dense jungles, the party finally met two members of the Phi Thong Luang who agreed to lead the expedition to the campsite of their clan.

Only eight Phi Thong Luang still survive—six men, one woman, and a small boy. Through pantomime and the limited use of the Laotian dialect, the museum group discovered that the rest of the women and children had been killed by tigers. Weaver comments:

"Our first strong impression was of a deep feeling of melancholy that seemed

to pervade these people. Our gifts and food, though highly valued, were received with little display of emotion. During the time we were with the clan seldom did even the suspicion of a smile cross their faces. They never once raised their voices in anger, fear or joy. They seemed to talk among themselves only when the necessity arose. Their life was indeed one of basic, joyless existence."

The tribe leads the most primitive life possible. The members wear few clothes, although the nights are very cold. They know nothing of agriculture or trapping and depend solely on hunting and food gathering for their food supply. At night the Phi Thong Luang do not sit around the camp fire telling folktales or stories of the day's happenings as many primitive groups do. The child has no toys and the adults do not engage in competitive sports.

All members of the group are suffering from malaria and yaws. The woman is particularly ill, and although the expedition treated her with modern drugs, her chances of survival are poor and the tribe seems destined for extinction.

New Associate Society of AAAS

The Society for Industrial and Applied Mathematics is a nonprofit corporation organized in April 1952 and is dedicated to the applications of mathematics. Formation of the society was first considered in late November 1951, and three general meetings were held in Philadelphia early in 1952. Speakers at these meetings were W. F. G. Swann, director of the Bartol Research Foundation; Mina Rees, presently dean of Hunter College, then director of the mathematical sciences division of the Office of Naval Research; and William E. Bradley, codirector of research, Philco Corporation. The enthusiastic response at these early meetings encouraged the organizers of the society to incorporate and to initiate plans for the next year.

Objectives of the society are (i) to further the application of mathematics to industry and science, (ii) to promote basic research in mathematics leading to new methods and techniques useful to industry and sciences, and (iii) to provide media for the exchange of information and ideas between mathematicians and other technical and scientific personnel.

Society activity includes section meetings, national meetings, and technical publications. There are two sections of the society in Pennsylvania, two in California, one in Massachusetts, one in Maryland, and one in New York. Other sections are being formed. Sections of the society sponsor meetings of local interest. The first national meeting of the society took place in Pittsburgh in 1954 at the annual meetings of the American Mathematical Society and the Mathematical Association of America. An active program of national meetings is being planned for the future.

The society sponsors several publications. These include a monthly newsletter and a quarterly technical journal. In addition, a series of monographs is being planned. A recent issue of the newsletter included the full text of an important address by M. H. Trytten, director of the Office of Scientific Personnel—"Science and engineering in the U.S.S.R. and U.S.A.: a comparison and appraisal." The first monograph of the society is a report prepared by F. J. Weyl, director of the mathematical sciences division of the Office of Naval Research entitled "A survey of training and research in applied mathematics in the United States." This timely report was prepared for the National Research Council under contract with the National Science Foundation. It surveys the present areas of mathematical research in the United States and it presents the results of a questionnaire on mathematical training that was circulated to many of the large universities.

The journal of the society contains both research papers and expository papers, but the emphasis is largely on the latter. The editors require that accepted papers have clear presentation and good exposition. In every case it is intended that the papers be easily read by a large audience and that adequate background be given so that the paper is more readily understood. Many of the papers may be considered teaching papers.

National officers of the society are John W. Mauchly, Remington Rand UNIVAC Division, president; Thomas M. Southard, Numerical Analysis Research at the University of California at Los Angeles, vice president; John W. Tukey, Princeton University and Bell Telephone Laboratories, vice president; Donald B. Houghton, Franklin Institute Laboratories, secretary; and Robert Bickel, Drexel Institute of Technology, treasurer. I. E. Block, Burroughs Corporation, is director of the society's publications committee. George W. Patterson, University of Pennsylvania, represents the society in the division of mathematics of the National Research Council.

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New Calorimeter

A bunsen-type calorimeter that can accurately measure very small quantities of heat at room temperature has been devised by R. S. Jessup of the National Bureau of Standards. Designed for investigating the basic thermodynamic properties of high polymers, this calorimeter is particularly suited to measurement of heats of reaction, heats of solution, and heats of mixing of polymeric and other substances.

This calorimeter is similar in principle to earlier bunsen-type calorimeters, but it has been modified to permit the use of diphenyl ether instead of water as the calorimetric substance. The use of diphenyl ether has two important advantages. First, the relatively large volume changes of diphenyl ether on freezing and melting provide a sensitivity more than 3 times that of the usual ice calorimeter. Small quantities of heat can thus be measured with greater accuracy. Second, diphenyl ether melts at 26.87°C. This means that observations can be made at room temperature, and the resulting data can be readily reduced to standard temperature at 25°C. Diphenyl ether has the further advantages of being quite stable and easily prepared in a state of high purity.

News Briefs

■ New figures on the size and shape of the earth show that its radius at the equator is 3,963.26 miles. This would make the earth's equatorial circumference about half a mile shorter than the accepted esimate of 24,902.39 miles. The new figures were presented by Bernard Chovitz and Irene Fischer of the Army Map Service in a paper submitted to the American Geophysical Union.

The scientists drew their conclusions from months of field work in Africa on an expedition led by David L. Mills of the map service in 1953 and 1954. They used a Univac computer to solve problems that would have taken 10 years without the machine.

■ Research workers at Camp Detrick, Frederick, Md., recently reported to the Society of American Bacteriologists that they have made vaccines that are effective in laboratory animals against several types of botulism bacteria.

■ Ira N. Gabrielson, president of the Wildlife Management Institute, Washington, will serve as chairman of the advisory committee for the Waterfowl Research Project of the Arctic Institute of North America. Albert M. Day, former director of the U.S. Fish and Wildlife Service, heads the 2-year fact-finding project, which began last June.

The purpose of the investigation is to study the programs and policies of all land and water-use agencies that directly or indirectly affect the breeding, protection, or perpetuation of migratory water-