resulting animal thus had a new central nervous system and had been removed from experience with hydrae by 15 generations. And yet it accepted a hydra and appropriated the nematocysts or "stingers."

This research has convinced me that life persists and is purposive.

Were I to have made this claim fifteen years ago, I should have had difficulty finding support in biological literature.

But times have changed. There appears to be a drift away from mechanism in modern biological thought. Haldane gives "freedom of the will" as one of four factors of evolution. Jennings says, "Emergent evolution does away with that monstrous absurdity that has so long been a reproach to biological science; the doctrine that ideas, ideals, purposes have no effect on behavior." Wells, Huxley and Wells, in "The Science of Life," record that, "Human purpose is one of the achievements of evolution" and that "Modern biology is steadily moving towards the conception of a single world-stuff with both material and mental aspects."

In modern biological thought, therefore, purposiveness is coming to be recognized. Mind is no longer the clatter of machinery but an entity placed upon a par with matter. Less is heard these days of the cerebral cells secreting thoughts as the liver secretes bile than was the case twenty years ago. Biologists may come to realize that mind (life) is an entity with which they must deal as do physicists and chemists deal with matter. They may come to agree with Jeans when he says, "To-day there is a wide measure of agreement, approaching almost to unanimity, that the stream of knowledge is leading towards a non-mechanical reality; the universe begins to look more like a great thought than like a great machine."

The cosmic test-tube of the mechanists seems to have boiled over, and we find the purposiveness of Aristotle threatening to displace the mechanist's idea of chance survival.

SCIENTIFIC EVENTS

THE BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION

LORD RUTHERFORD opened the new headquarters of the British Non-Ferrous Metals Research Association in London on June 8, near Euston Station. The building provides space for the collection of machinery to assist the staff in carrying out its work. The following summary of his address is given in the London *Times:*

The quantity and quality of the work of the association in the past ten years, Lord Rutherford said, were surprising when the early difficulties of the organization were considered. It seemed to him that in future they must divide the work of the association under three categories: (1) *ad hoc* researches or special investigations bearing on the difficulties of the industry at a particular moment, which might help to improve a product or get over some technical difficulty; (2) long-range fundamental research bearing on matters that lay at the foundation of the industry; and (3), finally, the steady accumulation of knowledge that would lead to the creation of new industries or the development of existing ones. An association of that kind could not take short views.

Referring to the need for close liaison between scientific men and industrialists, Lord Rutherford noted how much had been done by the association to simplify the results achieved by research to the industrial mind. He regarded this as an important matter, because it restricted the inevitable time lag that occurred between scientific discovery and its use in industry. In estimating the results of scientific research there was always a danger of taking too narrow a view of the work. They could not expect in research work a certain definite return every month. One of the marvels of the age was the development of the motor-car since 1900, on which tens of thousands of men were engaged to-day and for which special steels, special alloys and many other materials were required, each of them representing a great deal of research work. Of the 60 or 70 metals available for research only six or seven had been investigated by the association. What about the other 60? It was obvious that an enormous amount of work remained to be done.

There was probably not a single process that was going on in the industrial world that would not be capable of improvement if it were studied scientifically. He was quite sure that 90 per cent. of the processes used in industry could be improved by the application of science. In the new building there would be no lack of work in research for years to come, even if they multiplied the staff 10 to 20 times. The future of the metal industry, as of many others, was ultimately dependent on the application of science to industry. He thought that in the years to come only those industries would survive in the world which had shown their power of applying scientific knowledge to improve their methods of production.

RESEARCH RESERVES IN THE NATIONAL PARKS

A DEFINITE policy of preserving research reserves inside national park areas has been adopted by the National Park Service. The national parks themselves are areas preserved in as nearly as possible

their natural condition for the use of the people. The research reserves, however, carry the preservation a step farther, for in them it is proposed to maintain conditions unmodified and free from external influences of any sort, in order that their geologic and biologic exhibits may continue to be available in primitive form for the purposes of education and scientific investigation.

The research areas will not be approached by roads or trails, and will be located in isolated sections of the national parks where they will neither interfere with the administration of the parks nor with park use by the public.

Admission to these special areas, whose location will not be announced generally, will be by special permission only, and then only for the purpose of making scientific studies or in connection with the administration of the tract. The wild animals and plants in these perpetual reserves will be left absolutely unrestricted unless some invasion from the outside should seriously disturb the natural balance.

The idea of having these special research areas inside the national parks is not new, as the first one was established in the Yosemite National Park, California, in 1926. Another was established in Mount Rainier National Park, Washington, in 1928. While further reserves of this nature have been planned for several years, actual designation has awaited the formation of a definite policy in the matter and the making of the necessary field examinations and studies.

SUMMER WORK OF MEMBERS OF THE DIVISION OF GEOLOGY OF HARVARD UNIVERSITY

The Harvard Alumni Bulletin gives the following account of work planned for the summer by members of the Division of Geology:

Professor Percy Raymond will give a large part of the coming summer to the study of fossil crustaceans in museums of England, Scotland and Ireland. He sailed for England last month.

Professor R. DeC. Ward plans a short trip to several of the smaller islands of the West Indies in order to obtain first-hand information concerning their weather and climate. This "field-work" will be undertaken in connection with the writing of the chapters on the climatology of the United States, Mexico and the West Indies for the new Köppen-Geiger "Handbuch der Klimatologie." Professor Ward will be in Cambridge during the rest of the summer, writing his book on "The Principles of Climatology."

Russell Gibson, instructor in geology, will spend the summer in northwestern Montana, where he will examine mines and prospects and map a geology for the U. S. Geological Survey.

L. Don Leet, instructor in seismology, will devote the entire summer to the determination of the velocity of seismic waves in granite at Quincy, Massachusetts, and Westerly, Rhode Island, by recording on portable seismographs the vibrations set up by dynamite explosions.

Professor Kirtley Mather also will give some time to the geophysical research on the Quincy and Westerly granites, which is being carried on with the aid of a grant from the Milton Fund. Except for a few weeks' vacation on Mt. Desert Island, he will be at work during the rest of the summer on his new book entitled "South America, the Land and Its Resources."

Professor L. C. Graton will go to Canada early this month and continue his investigations of the geology of the ore deposits at the Hollinger mine, Porcupine, Ontario, and at the mines of the International Nickel Co., near Sudbury. Later in the summer, he expects to spend some time at the Hercules mine near Wallace, Idaho, and to visit a number of other western mining districts before returning to Cambridge.

Professor Donald H. McLaughlin will continue his geological work for the Homestake Mining Co. during the summer. Underground work at the company's large gold mine in the Black Hills of South Dakota will take six weeks or so, and a few additional weeks will be spent on mine examinations in Canada and in California. He will devote a few weeks to field work in the Tayoltita and Guanacevi districts in Mexico, where geological investigations are under way.

Professor Marland P. Billings will be on the staff of the U. S. Geological Survey during the summer. He will continue his work in the Rocky Mountains.

Professor Kirk Bryan will be in charge of the Harvard Summer School in the Jemez Mountains, New Mexico, from June 29 to August 8. He will spend the rest of the summer in the study of the physiography of the Rio Grande Valley (an investigation supported by the Shaler Memorial Fund) and somewhat later will prepare plans for an excursion for the International Geological Conference of 1933.

Professor Esper S. Larsen is at work in the field in California and will continue throughout the summer.

Professor D. S. Whittlesey expects to spend the whole summer in Europe, gathering material for a book he is preparing on economic geography. He plans to attend the International Geographical Congress in Paris, at which he will present a paper.

Harold S. Kemp, instructor in geography, will collect material throughout Central Europe, particularly in the Balkan States, to be used in the forthcoming "Geography of Europe," on which Professor Blanchard and he are working.

THE DEDICATION OF LAKESIDE HOSPITAL AT WESTERN RESERVE UNIVERSITY

THE formal dedication of the Lakeside Hospital group on June 17 brought to completion the Western Reserve Medical Center, on which the sum of $15,000,000 has been expended.