"FLYING" FISH

IN the western Atlantic, the Caribbean and the eastern Pacific I have observed flying fish with the help of Zeiss 7×50 binoculars from bridge heights of 30 feet and 68 feet. My observations are:

The fish fly very close to and parallel to the water surface. Sometimes they fly aboard gangways 3 feet above the water and rarely in heavy weather fly aboard a deck 12 feet high.

Flights are ordinarily straight, but one or two changes of ten or twenty degrees may occur.

Flights are ordinarily away from the ship or away from the fish, which are sometimes seen to leap from the water in chase of them.

The speed of flight apparently is uniform.

Flights are made in calm or moderately rough weather, though in the latter case flight sometimes seemed prematurely ended by collision with a wave in the way.

Actual emergence from the surface was rarely seen.

The parallel rows of double dots observed by Mr. Troxell[1] have been seen occasionally but not accompanying every flight.

Single flights were sometimes as short as a few yards, rarely as long as 150 yards.

Occasionally, especially when chased, the fish will make contact with the water with the lower part of its tail and by rapid sculling gain speed for further sustaining flight. This has been observed from a line of sight normal to the flight and was clearly seen as a bending downward of the tail to immerse the lower tip in the water, while the body kept its normal flying angle approximately parallel to the water. Viewed from behind and above, the sculling trace in the water is a beautiful sine curve whose amplitude to one side of the median is about equal to 180 degrees of the cycle. The trace may be from a yard to ten yards long.

G. B. MYERS
LIEUTENANT COMMANDER, U. S. NAVY

"FLYING" SALMON

ANENT "Again Flying Fishes."[1] Comparative vology may give light. The gurnard family is handy in movements. We see some of them walking on the floor of aquariums, but when a flying gurnard has not secured enough momentum and velocity for a flat trajectory over waves we see it descending and submerging the caudal fin only for a fresh start instead of using the pectorals as a bird would do. I photographed a series of salmon "flying" as much as eighteen feet in the air when surmounting a fall in the White Bear River in Labrador. They employed the pectoral fins as well as the caudal for progression and balancing in air as well as when in water. I have suggested to a friend that he take such pictures with his moving picture camera. These may be taken at a few yards distance instead of at a disappearing distance first.

ROBERT T. MORRIS
STAMFORD, CONN.

QUOTATIONS

LORD NUFFIELD'S NEW GIFTS TO OXFORD

AN Oxford that had made up its mind not to be surprised by Lord Nuffield's almost daily giving to hospitals and other institutions was agreeably staggered last week to learn that the university had been offered by him approximately £1,300,000 for three important purposes. The first of these is the erection and endowment of wards in connection with the Radcliffe Infirmary and the other hospitals associated with the School of Medicine, particularly the wards for the special use of the new Nuffield professors. The sum promised for this is £200,000, so that Lord Nuffield's endowment of the medical school within the past twelve months amounts to the munificent sum of £2,200,000. The second is the erection of the new laboratory of physical chemistry on a site between the Organic Chemistry Laboratory and the Department of Pathology in South Parks Road. For this a sum up to £100,000 is promised. The third and, to the general public, the most interesting, is the founding and endowment of a new college for post-graduate work in social studies, to be erected near Worcester College on the canal wharf that lies below St. Peter's Hall. For this, Lord Nuffield has given the valuable site itself, and a sum of about £900,000, about £250,000 of which will be required for the buildings.

The Oxford appeal launched last February aimed at £500,000 for definite and immediate needs, and a further £500,000 for the endowment of new developments in any subject that looks promising. It has now reached the sum of £423,000. As the physical chemistry laboratory is one of the immediate needs, this sum now becomes £523,000, and so as regards these needs the appeal has been successful. The first major step in the ordered development of the science area in the Parks has accordingly been taken—to proceed with the erection of the new physics laboratory for Professor F. A. Lindemann at a cost of about £80,000; and soon will follow the second, for which already provisional plans have been prepared—the erection and equipment of the university's first laboratory for physical chemistry with the sum given by Lord Nuffield, and the sums earmarked for it in the appeal fund.

[1] SCIENCE, 86: 2225, 177, August 20, 1937.

[1] SCIENCE, August 20, 1937.

The great majority of senior members of the university welcome these gifts as, of course, they deserve to be welcomed. A few complain that they will alter the character of the university considerably and, probably, for the worse; a few wish the offer had been entirely unconditional or, alternatively, that their own department or subject had been in the position of medicine, physical chemistry or social studies. As regards the last, it is realized that the success or failure of the new college will depend much on the start it gets and, in particular, on the first warden and fellows. A long and carefully drafted letter from Lord Nuffield to the Vice-Chancellor gives some ideas of the intended college and its fellows, and others have been got from some of the principal Oxford men who are concerned. The new college is to be mainly a post-graduate one, like All Souls', with accommodation for, say, fifty residents, and principally for research and investigation. It need not be entirely devoted to social studies; other subjects may be considered. It is not intended that it be a teaching institution in the ordinary sense or that it should train undergraduates for business careers, still less that it should be a place where the newly graduated may start to research according to their fancy. It is hoped that the fellows will be mature workers, brought back after they have been out in the world for some years, to do large-scale team work on those social subjects on which research is urgently needed. The new college, it is hoped, will not merely be a center for these activities in economics, politics, anthropology, sociology and the like, but also a place where men of business and affairs, by residing there, will have an opportunity of contributing their experience to the common fund. This cooperation of academic and non-academic persons in attacking problems in the social sciences is regarded as valuable by those who, with Lord Nuffield and the Vice-Chancellor, have been thinking of the welfare of the new college. It remains to be seen how Oxford makes use of these gifts, which bring, of course, their difficulties and responsibilities with them. That it will rise to the occasion no one who knows the temper of young Oxford at the present time will question.—*Nature.*

SCIENCE AND DEMOCRACY

YOUR recent editorial "Science and Democracy" begins with the words "Science as we know it is the child of democracy." From the point of view of a man of science the family relationship is here reversed: Democracy is the child of science. I quote from a convocation address with the same title as your editorial given at the University of Indiana in 1912:

> Without science our present civilization would not have been possible. It is the application of science to commerce and the arts that has created democracy. So long as food, clothing and dwellings were produced and transportation carried forward by unaided manual toil, so long as plague and famine, disease and premature death, were unchecked, it was impossible to give equal opportunities to all. Plato had to provide slaves for his republic; serfs and peasants have been partly emancipated only in our own time. It is the applied science of the past hundred years that has made child labor needless and universal education possible, that has made the still existing semi-slavery of industry wanton and intolerable.

You call attention to the proposal made in England that the British and American Associations for the Advancement of Science unite to draft "a magna charta, a declaration of independence," proclaiming that freedom of research and of exchange of knowledge is essential, and add, "Will the American association heed the appeal of its British counterpart?" At its meeting in Boston in 1933 the American association adopted the following "Declaration of Intellectual Freedom":

> The American Association for the Advancement of Science feels grave concern over persistent and threatening inroads upon intellectual freedom which have been made in recent times in many parts of the world.
>
> Our existing liberties have been won through ages of struggle and at enormous cost. If these are lost or seriously impaired there can be no hope of continued progress in science, of justice in government, of international or domestic peace or even of lasting material well-being.
>
> We regard the suppression of independent thought and of its free expression as a major crime against civilization itself. Yet oppression of this sort has been inflicted upon investigators, scholars, teachers and professional men in many ways, whether by governmental action, administrative coercion, or extralegal violence.
>
> We feel it our duty to denounce all such actions as intolerable forms of tyranny. There can be no compromise on this issue, for even the commonwealth of learning can not endure "half slave and half free." By our life and training as scientists and by our heritage as Americans we must stand for freedom.

J. MCKEEN CATTELL, *in the New York Times*

SCIENTIFIC BOOKS

ASTRONOMY

Text-Book on Spherical Astronomy. By W. M. SMART. Published January 5, 1937, in Cambridge: At The University Press, in New York: by the Macmillan Company. $5.50.

A HUNDRED years ago the only physical character-