

The study of protective agents during irradiation is widespread, and varies from the shielding of certain specific parts of an animal being irradiated and the use of 'sieves' during therapy, to the administration of chemical agents prior to irradiation. The effect in bone due to irradiation by 220-kV. and 2-MeV. beams and also the relative loss of phosphatase in mouse bone after irradiation by beams of energy varying from 100 to 1,000 kV. offer interesting evidence of the biological response to such radiations.

¹ Heady, J. A., and Barley, R. G., *Brit. Med. J.*, i, 1105 (May 16, 1953).

² Goulden F., Kennaway, E. L., and Urquhard, M. E., *Brit. J. Cancer*, 6, 1 (1952).

³ *Chem. and Indust.*, p. 820 (August 1, 1953).

NEW FISHERIES LABORATORY, BURNHAM-ON-CROUCH

By DR. H. A. COLE

A NEW Laboratory for research on inshore and shellfish problems was formally inaugurated at Burnham-on-Crouch, Essex, on September 23 by Mr. G. R. H. Nugent, M.P., joint parliamentary secretary to the Ministry of Agriculture and Fisheries, at a large gathering of representatives of local authorities in Essex, the sea fisheries committees of England and Wales, the shellfish industry and the universities and marine laboratories. Mr. Nugent was introduced by Mr. Michael Graham, director of fisheries investigations; Mr. E. R. Chadwyck-Healey, prime warden of the Fishmongers Company, and Mr. T. Driberg, M.P. for Maldon, also spoke.

The Laboratory is intended to serve as a centre for the wider investigation of inshore and shellfish problems than has hitherto been possible in the somewhat restricted accommodation provided by the Fisheries Experiment Station, Conway. Work will continue at Conway with a reduced staff on certain problems, notably the selective breeding of oysters and the cleansing of shellfish, for which the station is especially equipped.

The staff at Burnham comprises six scientists with technical and clerical assistance. The Laboratory is equipped with two research vessels. The larger, *Wystrys*, a converted oyster smack built at Whitstable nearly thirty years ago, saw war service with the Sunderland pilots. She is 50 ft. overall and is equipped with a specially designed trawling gallows from which two 4 ft. 6 in. dredges can be worked. The smaller vessel, *Jassa*, was recently built at Leigh-on-Sea and, although only 32 ft. in length, also works two large dredges. She has been designed as a general-purpose vessel for shrimp trawling, dredging and general research work.

The Laboratory has also been provided with about a hundred acres of experimental oyster grounds in the Rivers Crouch, Roach and Blackwater, some of which have been purchased while others are leased. Many were derelict when taken over and the principle of the reclamation methods is to introduce

mechanized cultivation at stages discovered by biological research to be critical, bearing in mind the economic factors. The work is providing new information on the control of pests and on the factors affecting the productivity of oyster grounds.

The Burnham Laboratory has been designed along simple functional lines with a preparation room, six research laboratories, a general laboratory, tank room, library, dark room, workshop, stores and offices, all on one floor, with a central corridor running the full length of the building. The construction is brick on a reinforced concrete secular raft, with a flat roof.

The site is immediately inside the sea-wall at the eastern end of the river front, and the Laboratory faces north-west on to open country. Sea water is delivered by special electrical pumps with hardened rubber casings into two cast-iron storage tanks on the roof of the Laboratory, from which discharge is by gravity to six small concrete tanks and a double row of sinks in the laboratory tank room. The larger piping is in cast-iron with an inert inner coating; the smaller piping is in ebonite. There is no recirculation of water, which is discharged to waste. Pumping arrangements are to a large extent automatic; but special provision has been made for flushing silt from the intake mains, as in the River Crouch the water is often very turbid. Compressed air is provided in all laboratories and in the tank room.

This is the first laboratory specially built for fishery research in the United Kingdom during the seventy or so years since its inception. The Crouch-Roach river system and the Thames area provide facilities for research on many inshore and shellfish problems. In addition to the important oyster fisheries in the Rivers Colne, Blackwater, Crouch and Roach, and at Whitstable, there are large shrimp fisheries based on Leigh-on-Sea, Tollesbury, Harwich and other ports; one of the largest cockle fisheries in Britain is based on Leigh-on-Sea, with many communities of inshore fishermen between Harwich and the North Foreland. The vast shellfish beds in



Photo by "Sport and General"

Fig. 1. The new Fisheries Laboratory of the Ministry of Agriculture and Fisheries at Burnham-on-Crouch, Essex

the Wash, the most important in point of yield in England and Wales, are within easy reach. Rail access to London is good, and it is hoped that the presence of a fully equipped marine station in this area will be taken advantage of by members of universities, for whom there is a certain amount of laboratory space.

Work was begun at Burnham-on-Crouch in 1947 in temporary quarters, and attention was concentrated first on the difficulties of the East Coast oyster industry, the productivity of which was at a low ebb, following the effects of the War and the exceptionally severe winters of 1940 and 1947, which aggravated a situation already difficult following the spread and multiplication of two imported oyster pests, the American slipper limpet, *Crepidula fornicata*, and the American whelk tingle, *Urosalpinx cinerea*. The research programme will gradually be expanded to include the study from the fishery aspect of all species of molluscs and crustacea of commercial importance; the economics of the inshore fishing industry will require examination at the same time. Current research work at the new Laboratory includes an investigation of the causes of fluctuations in the annual production of seed oysters in Essex; the control of oyster pests; an examination of the losses resulting from the relaying of oysters; the causes of the fluctuations in the pink shrimp fishery of the Thames area; the biology and control of the mussel parasite, *Mytilicola intestinalis*; the overfishing of cockle beds in South Wales; an examination of the fishery aspects of the 'white weed' industry (*Sertularia cupressina*); and a detailed study of the taxonomy and ecology of the small marine algae which are of such importance as food for marine larvæ.

The inshore fauna of the rivers and creeks of the Essex coast has been little studied and has proved to be of great interest. In shallow water the benthic community is dominated by *Crepidula*, with, in some areas, vast quantities of ascidians, principally *Ascidrella aspersa* and *Ciona intestinalis*. Silt in suspension greatly affects the composition and distribution of the fauna, which is highly specialized,

with close resemblances to the communities found in the Oosterschelde and the Wattenmeer, across the North Sea. Peculiar salinity conditions are also to be found in the rivers and creeks, which are in reality embanked inlets in the marshes. In the upper reaches in summer, salinity often exceeds 35 ‰, and temperatures of more than 20° C. may occur for several weeks at a time. Interchange and mixing with the North Sea is very slight in summer as the rainfall is low. As a result of these peculiar hydrological conditions there exists in the creeks a strongly marked community of animals which differs markedly from that found on more open coasts north and south of the Thames Estuary.

THE SALDANHA SKULL AND ITS ASSOCIATIONS

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THE expanding story of early man is a composite one, depending for its growth and documentation on the evidence from fossil remains and stone implements. It is in the nature of things that his stone implements should have survived the passage of time to a far greater extent than his bony remains. Only rarely, and often in unexpected places, do we get those fortuitous circumstances that lead to fossilization.

This is particularly true of that early stone-knapper, whom we call 'hand-axe man', because we know very little about him beyond the fact that he continued to make this implement to a more or less standardized pattern during the longest of human cultural spans, namely, the lower palæolithic.

In Europe the faunal remains of this period have survived to a considerable extent, and they reflect the cold and warm alternations of the Ice Ages. Human remains, however, are still very scarce, and at the moment are limited to two incomplete and apparently sapient human skulls, one from a 'Thames' terrace at Swanscombe, and the other from the Fontéchevade cave in France.

In South Africa, the hand-axe culture abounds in all the old river terraces; but for the most part the implements of this period are unaccompanied by bone. The one exception, so far, is the Vaal River, where the intensive search for diamonds has led to the discovery of valuable fossil remains.

The Site and Associated Fossils

In the Cape of Good Hope region, however, it is only within the past two years that the disparity between stone implements and fossils has begun to be redressed. This has been done by a group of scientific workers from the University of Cape Town, who have been studying a rich exposure of stone implements and fossils on a farm called 'Elandsfontein', owned by Mr. S. P. Lategan, and situated eighty miles



Photo by "Sport and General"

Fig. 2. The research vessels *Jassa* and *Wystrys*