

**The
Loch Ness
Investigation**

ANNUAL REPORT

1968



Price Two Shillings

:: **1968 ANNUAL REPORT** ::

With this Report goes a printed copy of the 1967 accounts. There was still a surplus at the end of the year, as the 1967 grant was received too late in the season for us to be able to purchase some items of equipment in the second-hand market while winter prices prevailed.

In April, 1968, Field Enterprises Education Corporation of Chicago gave us a further donation of \$10,000, and this, added to the surplus referred to, enabled us to buy three more reflex cameras, one in replacement of an outworn fixed focus camera and two for additional camera cars to cover the Invermoriston and Fort Augustus areas, thus giving us about 90% coverage of the loch. Additional caravans to hold larger groups were also purchased, and we equipped a first-class exhibition caravan with specially-designed display boards giving the general public all the relevant data about Loch Ness. This was visited by more than 32,000 people.

With all this equipment, with more volunteer watchers than ever before, and with an unrivalled summer for warm, sunny weather, with many long, calm spells, it is disappointing to have to record very few sightings, with the addition of only one significant sequence of film. The reason would appear to be that, owing to the drought there was an exceptionally small run of salmon and sea trout to lure any predator to the surface.

The best comparative figures are those available for the River Beauy, which runs into the sea near the mouth of the Ness:—

| <i>Year</i> | <i>Loch Ness Sightings</i> | <i>Salmon over top dam</i> |
|-------------|----------------------------|----------------------------|
| 1966 | 29 | 8,390 |
| 1967 | 23 | 12,749 |
| 1968 | 14 | 3,717 |

When it is considered that of the 1966 sightings four were almost certainly of the same individual, seen in the same place at intervals throughout the day, then there is a marked correlation between the number of salmon and the number of sightings in any season, and this point is borne out by the fact that this year there were not abnormally few sightings in April and May before the drought conditions became established.

A further point of significance is that if the phenomena reported are inanimate — logs, gas bubbles, floating vegetable matter or wave effects — then one would have expected to have had **more** sighting reports, with more observers, more tourists and more fine weather; and **less** sightings could only be the product of an animate response to external conditions such as few surface fish. Yet another point of interest was the overwhelming preponderance of north-easterly winds instead of the prevailing south-west. This led to the Dores end of the loch being the calm end "under the lee," and probably accounts for the bulk of the sightings being off Dores and not, as usual, off Fort Augustus.

In recording the following episodes it should be remembered that we keep a complete record of ship

movements in the loch, and discount any hump episode within half-an-hour of any vessel passing the point in question.

Recorded sightings then, were as follows (expedition members are marked *):—

1. April 18th, 1730 B.S.T., Miss C. Sanders* (22), teacher, was at H.Q. prior to opening of expedition, doing preparatory work when she saw an object off the Cobb mile-post. On putting a glass on it, it proved to be two-humped and about 15 ft. long. Before the camera could be reached, it sank slowly and vertically. Sky overcast, loch flat calm.
2. April 18th, 2102 B.S.T., Wallace V. Turl (65), headmaster, with a party consisting of three other teachers, an engineer, a student engineer, a history student, a shorthand typist, a housewife and a grammar school boy, were en route from Skye to Dingwall via Loch Ness, when they saw three humps:—"the first . . . was estimated by us to be 15 - 20 ft. long, the second, which was about the same distance away, was 3 - 4 ft. long, and the third, a further 10 - 12 ft. away, was quite small, about 2 ft. long. The first rose about 12 - 18 ins., the second and third 9 - 12 ins. The humps rose together and remained visible for approximately 15 seconds before sinking together under the surface, leaving three patches of shimmering scum which disappeared in a few seconds, leaving the lake clear and calm as at the beginning, without a ripple." All, bar one, of the witnesses thought they had seen a single living creature more than 45 ft. in length. This episode took place within a few hundred yards of the previous one, three-and-a-half hours earlier, though this was not known to these witnesses, so it is tempting to think they may have seen the same individual. Sighting occurred three minutes before lighting-up time, under a clear sky, with good visibility, and on a loch that was "calm, without any ripple."
3. May 4th, 2100 B.S.T., Lindsay Irvine (46), electrical contractor, Sgt. Richard Young (42), Police Officer, and Arnold Barnett (26), civil engineer, and others at the Clansman Hotel, observed about half-a-mile out, a long, dark, log-shaped object. In this aspect it was filmed by Mr Irvine and the film substantiates the story. Subsequently this long object broke up into two much more bulky humps and disappeared north, going at speed. Sergeant Young recounted this part of the episode, supported by drawings, on B.B.C. T.V. "To-morrow's World" on May 28th. Weather, flat calm.
4. May 5th, 2220 B.S.T., Philip Bull (17), student, and Howard Pratt (18), student, were in the common room of the Altsigh Youth Hostel when they saw a "greyish-brown" hump, 10 - 12 ft. long, cruising fast down the opposite side of the loch. The object disappeared behind a tree, but by the time they had got outside for a better view it had disappeared without trace. Witnesses could discern a wash. Weather, flat calm.

5. May 10th, 1625 B.S.T., Mrs O. C. Wolbourn from Los Angeles, her son, John Wolbourn, and her daughter-in-law, were motoring past Urquhart Castle when they observed a long, streaky turbulence out of which emerged three humps, each about 6 ft. long.
5. June 27th, time not stated. Sven Erik Lundberg (53), Swedish engineer, Mrs Lundberg (50), teacher, Arne Lundberg (16), student, were motoring from Invermoriston to Drumnadrochit when half-way across the loch they saw a "black," "very dark, but not really black," "green-black" hump. They stopped the car to look more closely and were reminded of "an upside down boat." Before it submerged they returned to the car to alert H.Q. Weather, "sunny, rather calm."
7. July 10th, 1120 - 1127 B.S.T., Fred Deacon, retired, and Mrs Deacon (63), housewife, had pulled into lay-by near Dores to admire the view when, at a range of 100 yards, they saw a ripple which gave way to a long, blackish body, which travelled slowly before submerging. Weather conditions, fair, surface of loch smooth.
3. July 23rd, approximately 1000 B.S.T., Ronald Heal (38), weaver, and Mrs Heal, were near Whitefield Cottage on the south side of the loch, opposite Urquhart Bay, when they saw a dark brown hump "well over 25 ft." long and 2 - 3 ft. high, fairly close inshore, proceeding south. They watched for seven minutes with aid of telescope before it disappeared from view round a point. Weather, clear and calm.
3. July 27th, 1720 - 1753 B.S.T., Michael McLean (52), motor engineer, and Nellie McLean (48), garage proprietor, both of Sutton Coldfield, Warwickshire, were in lay-by opposite Dores when, in Mrs McLean's words:—"I first saw a line of white foam. Later there seemed to be two small duck-like objects on the right-hand side of this line. We fed the gulls and then I noticed a 'V' shape coming straight towards us very fast with a line of white wash appearing each side. This changed direction towards the north, and through the binoculars I saw what appeared to be a head and neck. This continued up the loch very rapidly in line with the shore on our side. It moved a great deal of water behind it and this movement seemed to create a regular surging behind the neck on each side. I saw it surge up once or twice and the neck swelled into a disproportionately large body. I saw it submerge twice without any splashing, but the water was still surging over where it was. It changed direction towards the further shore. A gull settled on the water obliquely towards the left side of the creature, which went towards the gull and the gull flew up and over its head. As the gull went over the creature rose up and appeared to snap at the bird, moving its head very rapidly to follow the bird. I was astonished to see what I at first thought were wings, but the water drained off and these appeared to be flattened paddles. When a boat came down the loch on the same side the creature veered over to the shore and travelled in a straight line obliquely over to this. It finally submerged quite close to the far bank." Both witnesses filled in separate report forms, which tallied, and were interviewed by two separate senior members of the Bureau who found them impressive. Overall length of object estimated at 30 ft., colour, "brownish-grey," texture, "elephant-like," maximum height out of water, 5 - 6 ft., wash observed. Object reacted to distant vessel and was seen both to surface and submerge. Binoculars employed. Weather, cloudy and bright, surface of loch smooth. From an expedition point of view it was exasperating that this was the one and only day in a period of prolonged flat calm when out-stations were closed down early owing to eye-strain and fatigue. It is easy to be wise after the event, but at the time this seemed the right thing to do with a bad weather forecast that did not materialise.
10. August 26th, 0945 B.S.T., F. W. Holiday* (47), journalist, David Pickett (35), schoolmaster, and Dorothy Pickett (37), housewife, were all standing in lay-by on Dores/Foyers road opposite Clansman Hotel. James MacKay (19), petrol pump attendant at Clansman filling station. The three southern observers briefly saw a long, black, shiny hump just off the Clansman Hotel, moving rapidly south-west. At the same time (as far as one can judge), James MacKay and a customer saw this same object at a range of only 100 - 200 yards. Wind, north-east. Sunny. Surface slightly rippled.
11. September 4th, 1115 - 1145 B.S.T., Mr and Mrs E. A. Grummit and their son, David Grummit (19), were in a lay-by just south of Altsigh when they observed a spherical hump 3 ft. long and 2 ft. high, stationary, and about two-thirds of the way directly across the loch. During the next half-hour it submerged twice, only to re-appear after a few minutes interval in a slightly different place. Finally, it submerged on the advent of a motor boat. The hump was "black and smooth, something like a seal's head." Weather, "hot and sunny." Surface of loch "very calm, like glass."
12. August 26th, 1530 B.S.T., Mr Tom Thresh (40), haulage contractor, his wife, Betty (34), and daughter, Kathryn (13), stopped their car just south of Dores to go for a short row in their new fibreglass dinghy. They were 50 yards off-shore when they were alerted by voices shouting "Look out, be careful." These came from Mr John Cameron (39), civil servant, of Inverness, his wife, Ann (32), and his mother (71), who were standing on the beach. The reason for the warning was that two massive disturbances, the first about 40 ft. long and the second 30 ft. long, were approaching from off Tor Point. As they got abreast of the dinghy at a range of 50 yards, humps briefly broke surface from the second disturbance, being "black-grey, shiny, like a wet elephant skin." Speed about 10 m.p.h. Shortly afterwards the bow waves of the object hit the 9 ft. 6 ins. boat broadside on and very nearly capsized it. Day, sunny, light ripples.
13. September 19th, 1530 - 1535 B.S.T., Cmdr. R. K. Silcock, R.N. (retd.) (66), and Mrs Silcock (56), housewife, were in a lay-by opposite Dores when they observed a very dark object 6 - 8 ft. long break surface and cruise slowly south-west, submerging and re-surfacing three times. The V-shaped bow wave, seen before the object became visible, was most pronounced: "the beginning and ending of the apex of the wake, in perfectly still water, was very similar to the surfacing of a submarine and of

its submerging, both of which phenomenon I am very familiar" (Cmdr. Silcock). Weather, fine and dry. Light airs from south-west. Surface flat calm.

14. November 6th, 0830 - 0835 B.S.T., J. F. M. Macleod (36), Solicitor, of Inverness, and former Liberal Parliamentary candidate, got into his car on south shore of Bona Narrows and slammed the door. Immediately there was a loud splash and ripples extended from shore to shore. Two minutes later there was another splash from well inside Loch Dochfour, followed, after a further interval, by the brief appearance of a head and neck, angled at 70 deg., making back towards Loch Ness. Bona Narrows is only 50 yards wide, the length of the neck at 4 ft. was estimated by reference to the cocked outboard of a boat moored in the opposite bank.

Although the foregoing completes the tally of sightings proper, there was one other significant account from Loch Ness. On the evening of May 27th, Kenneth Warren (43), bus driver, from Norwich, was standing in one foot of water spinning for trout, just south of Invermoriston. Behind him on the shore stood his wife, Phyllis (43). It was a flat calm day and they had been fishing for more than three hours without any occurrence of note. Suddenly they both had to make a dash for higher ground as a very substantial wave came in without any vessel being visible to account for it. On going higher and fetching binoculars they saw that the agents causing the disturbance were two *separate* double-humped objects just below the surface, that were cruising down the middle of the loch towards Fort Augustus and then turned back and passed them again making north towards the far shore.

During August, too, there were indications of a different order. During that month a team from Birmingham University working in conjunction with the Bureau, fitted a new type of sonar equipment on Temple Pier and operated it on a fixed bearing across the loch for a fortnight, taking cine film of the cathode-ray display continuously, at intervals of ten seconds, throughout. Temple Pier was used as the only place around the loch to have a 15 amp. power supply within easy reach of the water, and the sonar equipment was fitted ashore to eliminate disturbance by boat's engines.

Their results as published in the *New Scientist* of December 19th, 1968, are reproduced as an Appendix to this Report. They were rapidly attacked by *Nature* (December 28th, 1968), and by *The Times*, and by a letter from Dr Maurice Burton in the *Daily Telegraph*, on the grounds that the sonar equipment had been tested by the Fisheries Laboratory at Lowestoft, when it had been found to be "prone to ambiguities." What the source of this information was is far from clear as the equipment had never left the hands of Birmingham University. There the matter rests at present.

* * *

Next comes an account from Loch Morar. On August 27th, at 1015 B.S.T., John MacVarish (41), a hotel worker with an excellent local reputation for reliability, was out in a boat off Lettermorar Point. The day was very calm and clear, with no wind. Suddenly he saw what looked like a man standing in a boat, but

on closer inspection this proved to be a dark, horse-like head and neck, tapering towards the top. He tried to chase it in the boat, but at a range of about 400 yards it changed course out towards the middle of the loch and submerged vertically.

* * *

The next story goes back to the war years, but has only recently come to light, thanks to a letter from former trawlerman, Martin C. Day, of Hull. His story read as follows:—

"Sometime around 1941, I cannot say for certain, two Naval Drifters were operating with submarine nets in and around the Sound of Sleat, in which (I was in charge of one) the nets, made of steel wire mesh were in deep water across from, I think, the Isle of Ornsay to Loch Hourn. We had a report one morning from Glenelg, whilst we were at Loch Alsh, that the lights which were fixed to the nets had gone of during the night. We thought we had caught an enemy submarine and went out to them right away and started hauling them aboard. They were heavy to get up and were all up excepting the last big 12 ft. square mesh when I looked over the ship's side, saw something that puzzled me, so we made fast the net, lowered it down on the deck to take another heave up. First I saw the big head, and jaws about 4 ft. long, come over the rail, long head and big eyes, but it was dead and had been dead for some time. However, I stopped heaving whilst I signalled the other ship to come and see it because they had two officers on board, and whilst they steamed towards us, I told the winch-men to heave up very steady. Well, I managed to get it to the mast-head, which would be 20 ft. high, I looked over the side again and its tail was wavering down under the ship's bottom. With all the excitement and the other ship steaming up astern of us, the strop parted, it cut partly through the neck and down it came, the weight of its body and tail taking it back overboard. None of the crew wanted any dinner because of the stench, some of them were sick. To me it looked like a giant newt without legs, because its tail tapered down to something like a point. I thought at the time the tide must have brought it down from somewhere . . ."

In a subsequent letter Mr Day informed me that the Boom Defence vessels concerned were the *Ocean Swell*, in which he was serving, and the *Norbreeze*, which never approached close enough to see what went on.

This account was of such interest that I wrote to all crew members of the *Ocean Swell* and, although the addresses used were more than 25 years old, three of the remaining twelve men answered, all recalling the incident though, naturally, their stories varied considerably in detail after such a long interval of time. I also took advantage of a visit to Hull to call on Mr Day and taped a long conversation with him. Certainly the composite picture that emerged from these four sources, while often contradictory, was much more like the creatures reported in Loch Ness than any marine animal known to science.

There was agreement that the creature was long dead and very smelly, but not on the degree of putrefaction, Mr Day thinking that the skin was substantially intact, while Mr Nicholson saw much of the skeleton. The head was larger than the neck, "like a sheep," "like a seal," there were eyes of no particular note, but no horns,

ears or other appendages. The neck was under a foot in diameter, the rib cage "massive," "7-8 ft. across." The flesh was "white," "pale," the skin "black," "mottled black." There was a pointed tail, but no-one observed any trace of limbs. Certainly a remarkable creature.

IRELAND:

Another aspect which exercised us much during the year was a growing volume of reports from Ireland. In 1964 I had enquired of the Inland Fisheries Board and had been given a single detailed account from Lough Ree, which was so fascinating that I called on its author, a very well-known Dublin parish priest. Apparently, in May, 1960, he and two colleagues were drifting on a flat calm lough waiting for the Mayfly rise to start, when a smallish creature 6-8 ft. long, with forward jutting head and neck, and a single hump, surfaced not far from their boat. The account of this episode, written that same evening, bore every mark of care and authenticity.

As a result of this, an Irish Bureau member, Captain Lionel Leslie, broadcast appeals for information throughout the Irish local press, and received one impressive reply from Mr Edward Alston, the Church of Ireland Rector of Clifden, County Galway. So, following visits from Captain Leslie and myself, a group of Bureau members, including Professor Mackal and Dick Lewis, scientific correspondent of the *Chicago Sun-Times*, went over under Lionel Leslie's guidance to evaluate the evidence.

On the evening of arrival, we dined with Mr Alston. Now 74 years of age, and just retired, Mr Alston served five years before the mast in sail before ordination, and is a formidable fisherman and shot, and a naturalist of great experience. It was he who collected the various accounts we were to hear next day. Over and above this, he, himself, had a sighting a few years ago, of a long-necked creature amidst seals playing in the salt-water Clifden Estuary.

It would need the Irish Ordnance Survey Map, Sheet No. 93, to pick up the precise location of all the loughs to be mentioned, so suffice it to say that all are within five miles radius of Clifden, all have relatively easy access by narrow stream to the sea, and all are of between one and twenty acres in extent. They are set in remote and cold countryside.

Georgina Carberry is a local woman with an intimate knowledge of the loughs, paths and bogs that constitute the area of Connemarra around Clifden. She has frequently been out fishing with the local fleet, and is familiar with whales, seals, basking sharks, otters and all other neighbouring aquatic creatures. In 1952 she and two friends landed to picnic on a small promontory jutting out into Lough Fadda after a long day's fishing. It is almost superfluous to add that it was hot, sunny and mirror calm. Suddenly they saw what they thought to be a man swimming in the middle of the lough, some 400 yards away. A closer look revealed that it was a long-necked creature coming slowly in towards them. The party kept silent until the beast was within 25 yards of the shore and making straight for their boat. When someone cried out, it turned abruptly, revealing a humped back and forked tail before crash-diving. Miss Carberry was particularly struck by its black, seal-like skin, and the rippling sinuosity of the neck muscles.

Some years later when Miss Carberry was once again fishing Lough Fadda, a man acquaintance suddenly

announced his intention of going home. It was only after they had landed that he admitted having seen a large, newt-like creature underneath their boat.

I have also met one of Miss Carberry's companions on the first episode and did not find it possible to pick holes in either of their accounts. Like Alex. Campbell at Fort Augustus, Miss Carberry is always prepared to stand up and be counted by either the press or T.V. To her, therefore, others more fearful of ridicule, are apt to turn.

Loughs Derrylea and Lochourenlough adjoin the main Galway road and are only separated by a narrow isthmus of land. On April 1st, 1965, Mr Conneely, an intelligent, quiet-spoken man, who has lived and worked in the U.S., was gardening on a warm, sunny day, when a creature about 12 ft. long arose in front of his cottage. He approached fairly closely as it rose and fell: the head and neck and the tail were as described by Miss Carberry, but at no time could he make out body detail. He was emphatic that it was no otter or seal, and recalled that about eighty years previously, when his father was a boy, a "giant eel" had tried to get through the culvert between the two loughs and had got wedged, greatly damaging the stonework before it died in an effort to extricate itself. His father said it was so repulsive in appearance that no-one dared to remove the corpse, which rotted away before they rebuilt the culvert. He added that it was a matter of common knowledge that these creatures migrated overland.

We next visited another glen leading down to Clifden, at the head of which lie Loughs Shanakeever and Auna. Each is about a quarter of a mile long and about 100 yards wide, separated by a few hundred yards of bog, and their shape is determined by that of the glen. About 200 yards from Lough Shanakeever, the lower of the two, is a cottage inhabited by Mr Joyce and his widowed mother. Last year, after dealing with the animals, he watched a large, greyish, two-humped object for about five minutes going from a point he indicated on the lough to another point, where it went out of view. He was too far away to make out any detail, but his mother confirmed that, as a boy, he had always been made to stay away from the lough because of the "giant eels" which was information he derived from his late father, who would have been in his mid-seventies.

Lough Auna is said to have been the site of a land sighting a few years ago, but we were unable to contact the witnesses.

Lough Nahooin, the scene of the most recent and the most spectacular encounter, lies off a road along the northern bank of the Clifden Estuary and is several hundred yards inland. Simply from the point of view of ease of access, it is worthy of note that, while it holds brown trout up to three-quarter lb., no sea trout has ever been recorded as being caught there. It is about 100 yards long and only 60 yards wide, and about 30 ft. deep at its deepest point. Near the lough, but not overlooking it, is the very isolated cottage belonging to Mr Albert Coyne, who works in the local marble quarry. He has lived there all his life, as did his father before him.

At 1910 B.S.T., on the lovely evening of February 22nd, 1968, Mr Coyne took his five children for a walk down to the lough. The sun had just set (Ireland having gone over to B.S.T. four days previously, and Clifden being 10° west), but the sky was so clear that the

light was holding well when he saw what he thought was his dog swimming in the water. When he whistled to it the dog came bounding up from behind him, so he looked more closely and realised that he was seeing a vertical head and neck about 2 ft. out of the water, and 9 - 12 ins. in diameter. The dog started barking and the creature approached to within nine yards, opening its mouth and displaying white inside. He saw no trace of any eyes. Whenever the head and neck submerged, the back appeared, and he formed the view that it was about 12 ft. long. He was not frightened as he was fully occupied controlling the dog. The creature was still there when they left in the gathering gloom.

Visiting Mrs Coyne and the children separately, we found they were desperately bad witnesses in the sense that every single fact had to be dug out and nothing was volunteered. Indeed, none of the children ever spoke at all, apart from one isolated interruption from the eldest, an eight-year-old boy, about some point of detail which would have taken days of careful rehearsal to stage-manage. Mrs Coyne, who had been fetched to the scene by one of the children, at first said that she had not really seen anything. Had she seen a head? "Well, yes." Did it have a mouth? "Yes, rather underslung in relation to the muzzle like a seal's." Could she make out any eyes? "No, but there were two small protuberances which she took for ears." Was there a neck? "Yes, but substantially the same thickness as the head." How about a back? "Well, a large hump did appear every time the head and neck went down." Could she make out any limbs? "No." What was the colour and texture? "Black, shiny and hairless, like an eel." Did she ever see a tail? "Yes, it was flat and rounded like a mattock." All in all, in fact, she had observed a surprising amount.

Mr Coyne had had one similar experience just after the war with his brother, who had gone to the States. By good fortune this brother had just come over on

holiday from Brooklyn, so we were able to get this earlier account verified also.

In reviewing the accounts given above, and also Georgina Carberry's, it seems plain that several people within a radius of five miles have had a pretty-well identical experience in four different loughs, three out of the four being at very close range, indeed, while experienced country folk could hardly be expected to be more than say 30% out in their estimation of range or size. There are, of course, so many points in common with the Loch Ness accounts with which I am familiar, that it is not necessary to list them: the main differences are firstly one of size, which clearly does not present any great problem, since this could be a function of food supply, secondly, of the head and neck seeming relatively squatter and thicker in relation to body length, and thirdly, that two out of four sightings were either entirely, or sometimes, a display of head and neck and tail, without intervening back or humps. I only know of one similar account from Loch Ness (Mr MacLean, taxi driver, off Altsigh, in 1935).

Considering these episodes as a whole, in conjunction with fairly numerous other Irish reports, it is clear that either they are a series of inter-connected hoaxes by people who are anxious, at all costs, to have their names kept out of the newspapers and wireless, or, that they are ludicrously gross errors of judgment on the part of quite a large number of experienced countrymen, all of whom are well acquainted with otters, seals and even basking sharks, or else that these stories are substantially true, in which case an unidentified species, either similar to or different from the Loch Ness species, has still to find its way into the text books. It must be added that the Irish Inland Fisheries Board has always been inclined to discount these stories in their entirety, and no professional zoologist has ever bothered to interview witnesses before.

:: SUMMARY ::

All this year's evidence tends to strengthen belief that long-necked creatures of varying size live in Scottish and Irish lochs as well as in the sea. Whether they are all of the same species it is impossible, as yet, to say, though the points of resemblance between accounts would lead one to believe this likely.

If they are the same, then a very remarkable creature is involved, attaining lengths of 30 ft. and more, living in a fresh or salt-water environment, much of the time at great depth with rare surface forays to fish or bask, and even rarer visits — so far as Loch Ness is concerned — on to the beach. Yet the smallness of some of the Irish loughs is such that no substantial creature could sustain life in them for long, and hence, fairly long boggy overland treks must be envisaged.

In the process of elimination, clearly the next step should be to find out whether the creatures are air-breathers or not. Using the latest in sonar apparatus it should be possible to hold one individual on the screen

long enough to see whether it has to surface or not. If it does, that would enormously reduce the number of possible solutions.

Should we be dealing with a mammal — and it must be stressed that we do not know yet — then Professor Mackal has suggested that Sirenians should be seriously considered. These air-breathing mammals are represented to-day by the Australian Dugongs and South American Manatees, who are equally at home in a salt-water or fresh-water environment. They are intensely shy of noise, and have tough, wrinkly skins, both qualities often remarked upon in Loch Ness. They are, however, tropical animals, vegetarians, and much too small — 9 to 12 ft. — to fill the bill.

There was, however, a recently extinct form, Steller's Sea-cow, which much more measures up to requirements since individuals attained a length of 35 ft., and the only known colony lived among the ice-flows around the Copper and Bering Islands in the Bering Sea, just south

of Alaska. Furthermore, they had unusually heavy bones (much heavier than the idea of a fish-eating Sirenian), so that the idea of a fish-eating Sirenian becomes much more acceptable. All that can be said at present, though, is that an adapted Sirenian presents fewer incongruities than any other solution, on the basis of the evidence so far available.

These creatures were torpedo-shaped herbivores, where we think we are discussing long-necked carnivores, but the skeletal neck length at 6 - 7 ft. would fit, and a fining down of the neck consequent on engaging upon a life of predation would have been a possible adaptation no greater than the giraffe developing a long neck for browsing on tree foliage. According to Dr Bertram, the fossil record contains a form of Sirenian which fed on

Time, luck, and the extraordinary pertinacity of our volunteer watchers will ultimately produce the missing pieces of our jigsaw puzzle. Meanwhile, we would not be human if we did not canvass every possible solution.

My thanks go to all who make this Annual Report possible.

DAVID JAMES.

Sonar picks up stirrings in Loch Ness

Observations made last August by a team from Birmingham University using a new type of sonar suggest that the loch contains some sort of animal life. A great deal more investigation, however, with more refined equipment is needed before definite conclusions can be drawn from the results

Hugh Braithwaite

is senior research associate and D. Gordon Tucker is professor in the department of electronic and electrical engineering, University of Birmingham

During August 1968 the Department of Electronic and Electrical Engineering of the University of Birmingham carried out a simple technical trial of a new type of sonar equipment in Loch Ness. The opportunity was taken to obtain cine photos of the cathode ray display of the sonar at intervals of 10 s continuously over a two-week period, with various configurations of the sonar beam. Examination of all this film shows only one series of occurrences of any outstanding general interest. This one series which lasts for about 13 min, is, however, worthy of description.

The sonar, which had an acoustic emission of frequency 50 kHz, was of a type recently developed at Birmingham and known as the "digital sonar" because it uses a new kind of signal processing that is entirely digital in function (see J. W. R. Griffiths and D. J. Creasey, "A digital sonar system", *Journal of Scientific Instruments*, vol. 43, 1966, p. 534). But for present purposes it is satisfactory to think of it as having inherently a high resolution in range (of the order of one metre) which is in practice worsened by the spot size of the cathode ray display, and an angular accuracy in one plane (in these trials this was the vertical plane) which is usually very much better than two degrees. There is no resolution in the other plane (here the horizontal plane) and here the beamwidth (or horizontal sector of observation)

is about 12 degrees.

The sonar was fitted on Temple Pier in Urquhart Bay so that effectively the sonar was looking straight across the loch, here nearly three kilometres wide. The floor of the loch shelves steeply down to a maximum depth of over 200 m, so that the situation was approximately as shown in Figure 1.

At a range of approximately 1.2 km a large stationary target was recorded in midwater, as shown clearly in all the sonar records here presented. Figure 2 shows the basis of the "B-scan" display used, with its rectangular coordinates of range and depression angle. Various stationary irregularities on the bottom show clearly along the lower edge of the display, and the large isolated midwater target is about 75 m below the surface and perhaps 50 m in extent along the range axis. It may well have been a large waterlogged tree with other debris caught in it. An alternative and more likely explanation is that it was a large submerged rock face off Strone Point energized by the tertiary lobe of the horizontal diffraction pattern of the sonar transmitter and picked up on the broad horizontal beam of the receiver. Whether such a rock face exists we do not know. The team was not equipped to investigate the physical nature of this target by direct examination.

The sequence of photos taken of the display during the period of interest (28 August, about 16.30

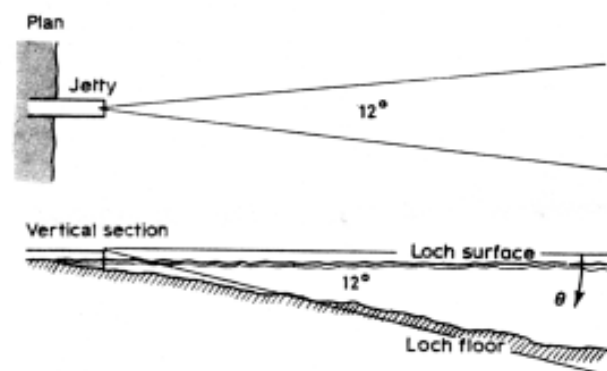


Figure 1 Geometry of sonar beam

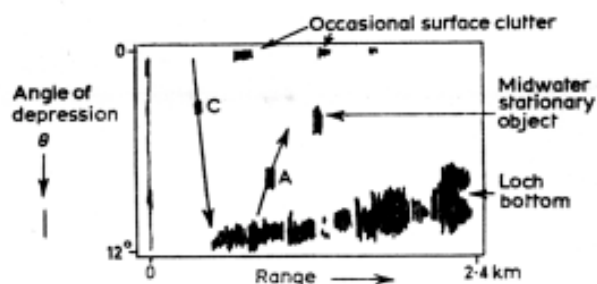


Figure 2 Sketch of "B-scan" display to serve as explanation of photographs. It is a Cartesian plot of range and angle of depression (θ) corresponding to the vertical cross-section in Figure 1.

A is the large moving "object" the movements of which are indicated in the sequence of display photographs shown in Figure 3.

C is a smaller object which dives from near the surface to the bottom in frames 16-18 in Figure 3

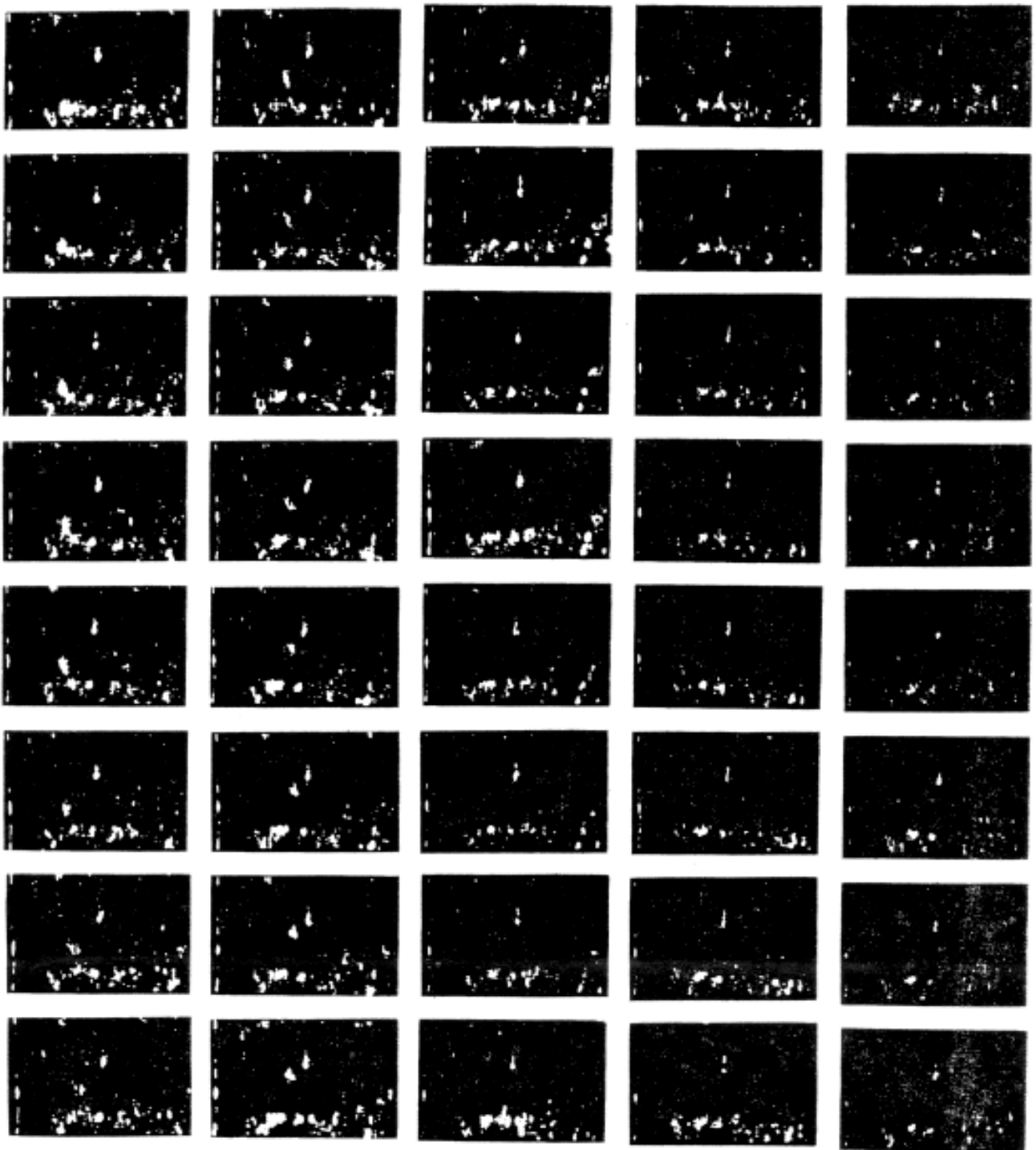


Figure 3 Sequences of frames from the cine record of the sonar display. Interval of time between frames with consecutive numbers is 10 s. Column 1 has frames 1-8 reading downwards. Column 2 has frames 9-16 reading downwards.

Column 3 has frames 17-24 reading downwards. Column 4 has frames 25-32 reading downwards. Column 5 has frames 70-77 reading downwards. Frames 33-69 are not reproduced here as they show no movements of interest

Sonar picks up stirrings in Loch Ness

h) is shown in Figure 3. A sonar pulse of duration 1.5 m/s was transmitted every 10 s and the cine camera was synchronized to this, so that each frame shows the returns from one pulse. It can be seen that on frame 2, a large object starts to rise from the bottom of the loch and by frame 17 has reached almost the height of the large fixed object and has moved towards it in range. It then almost disappears out of the sector. The moving object is of the same order of size as the fixed one; the dimension in range ought to be fairly reliable (i.e. at least 50 m) although fluctuations in the echo structure from pulse to pulse due to random effects reduce the accuracy of individual frames. The vertical dimension is however uncertain since the resolution of the sonar in angle is not good enough to say what this dimension is with any reasonable accuracy—it might be as great as 20 to 30 m.

There is no means of telling what the track of this object is in the horizontal plane, but its velocity component along the axis of the sonar has a maximum value of about 3.3 m/s or about 6.5 knots. The vertical component of its velocity has a maximum value of about 0.5 m/s or 100 ft/min. This high speed component in the horizontal plane seems to rule out any possibility of the object being inanimate. That it could be due to currents in the water is made unlikely not only by its magnitude but also by the subsequent observations discussed below. From the echo structure it is most likely to be a number of individual objects of fairly large size, but the sonar picture is not really capable of sufficient detail to enable any more definite statement to be made.

Of the 77 frames which cover the period of interest, 33 to 69 contain no movements of interest and have not been included in Figure 3. A detailed analysis of the others is given below. It will be seen that the large object discussed above (which is referred to as object A) has a continued history, some part of it apparently descending to the bottom, staying there for about six minutes, and then ascending again. Two other objects also appear. Object B, which appears in frames 8 to 13, could certainly be a fish or a small shoal of fish swimming at constant depth. Object C is more startling. It appears only in frames 16 to 18, but has a horizontal velocity component along the range axis of the order of 7.5 m/s or 15 knots while diving at 2.4 m/s or 450 ft/min. It appears to have a length of several metres.

Since the objects A and C are clearly comprised of animals, is it possible they could be fish? The high rate of ascent and descent makes it seem very unlikely, and fishery biologists we have consulted cannot suggest what fish they might be. It is a temptation to suppose they must be the fabulous Loch Ness monsters, now observed for the first time in their underwater activities! The present data, while leaving this as a possibility, are quite inadequate to decide the matter. A great deal of further investigation with more refined equipment—which is not at present available—is needed before definite conclusions can be drawn.

We wish to acknowledge the help of our colleague Dr D. J. Creasey, and assistance with local arrangements and finance from the Loch Ness Phenomena Investigation Bureau.

DETAILED ANALYSIS OF FIGURE 3

OBJECT A

| | |
|---------|--|
| Frame 2 | Large object (A) clearly seen rising from bottom at 0.8 km range. |
| 5 | Object A clear of bottom. |
| 6 | Vertical movement has now been about 2°, corresponding to 27 m rise, taking place in 50 s; i.e. vertical velocity about 0.5 m/s (about 100 ft/min). Object still at 0.8 km range. |
| 7, 8 | Individual components of this large object seem to be somewhat dispersed on these frames. |
| 12 | Object has now moved out to 1 km range, at which it remains until it almost disappears from the beam at frame 18. Maximum horizontal velocity along range axis, 200 m in 60 s i.e. about 3.3 m/s (about 6.5 knots). |
| 17 | From frame 6 the vertical movement has been slower, about 35 m rise in 110 s i.e. about 0.3 m/s (about 60 ft/min). Last appearance of object A as a large object. |
| 18-23 | Vestige of object A still present on most frames, with range decreasing from 1 km to 0.72 km in 60 s, i.e. with horizontal velocity along range axis about 4.6 m/s (about 9 knots); depth approximately constant. |
| 24-32 | Object A now larger again and conglomerate as before, although not as large as in previous ascent. Descends to bottom at range 0.6 km, with mean horizontal velocity along range axis about 1.5 m/s (about 3 knots); mean rate of descent about 40 m in 80 s i.e. about 0.5 m/s. |
| 33-69 | No movements of interest; frames not included in Figure 3. |
| 70-77 | Object A rises from bottom at range 0.6 km, with only small movement along range axis, but vertical rise of about 42 m in 70 s about 0.6 m/s (about 120 ft/min). |

OBJECT B

| | |
|-------------|---|
| Frames 8-13 | Smaller object (B) observable at 0.4 km range and 4° angle of depression. Stationary in range and depth while in beam. Fairly obviously a small shoal or single large fish swimming into and out of beam. |
|-------------|---|

OBJECT C

| | |
|----------|--|
| Frame 16 | Object C, fairly long vertically and short horizontally, enters beam at range 0.35 km, angle of depression 1.5°. |
| 17 | At range 0.4 km, angle 3°. |
| 18 | At range 0.5 km, angle 8°. Mean horizontal velocity approximately 150 m in 20 s i.e. about 7.5 m/s (about 15 knots). (The accuracy of this figure is low, but the speed must certainly exceed 10 knots.) Mean rate of dive about 48 m in 20 s i.e. about 2.4 m/s (450 ft/min). |