

Ness Information Service

Nessletter No.25

December 1977

Sighting

I have a little more information on the sighting reported in NIS 24. It was in the afternoon of Saturday October 29th that three young people reported seeing 'Nessie'. 22 year old Miss Joan Murray was on the old pier at the entrance to the Caledonian Canal at Fort Augustus, with her two young friends Caroline Mackay and Helen Stewart. When they saw two humps and a thin tapering neck, all appeared dark coloured and the humps were clearly apart. It was estimated to be half a mile offshore and moved around for a while then submerged but reappeared for a short time before finally disappearing. The whole episode lasted about fifteen minutes, the weather and visibility were good but a little later it started to drizzle.

Warmblooded

One of the theories put forward to explain the mystery of Loch Ness is that there is a 'left-over' from the age of the Dinosaurs there, something in the line of a plesiosaurus, perhaps. One of the main arguments against this is the fact that dinosaurs are generally thought to be cold-blooded.

But there is now a growing body of thought that they may have been warm-blooded, and work is being done in various parts of the world to try to establish this. Neil Alexander, Professor of Zoology at Leeds University, has been researching present day animals and how they move. He has made a study of animals from gerbil size up to elephant size. By taking the length of the leg bones, and how the stride lengthens with speed, he is able to work out a 'froud' number for each type of animal. He has taken fossil brontosaurus footprints found in Texas and from these and bone sizes has worked out the froud number, results show a speed of 2m.p.h. also the fact that if a brontosaurus (weight about 70 tons) travelled at 12 m.p.h. it would have broken its legs. This froud number method was used on some other dinosaurs showing that some of them were very swift in movement. Which is supported by work done at Yale University by Professor John Ostrom, who has been studying a new dinosaur. This is *Dinonicus* a fairly small creature standing 4 to 5 feet tall about 8 feet long weighing around 175 pounds. It was a carnivore with a sickle like claw on one toe of each front foot, obviously not for walking but for use as an offensive weapon. The 4 foot long tail had ossified vertebrae, tendons along the vertebra, making it a stiff pole-like structure, which was used as a balance with the animal standing on its well developed hind legs. This presents a picture of an agile, nimble, animal, hopping about on its hind legs using the front sickle-like claws as weapons against its prey, which is very unlike the 'Kimodo dragon-like' image generally given to dinosaurs. This degree of high neurological development was also found in some other fossil dinosaurs. This indicates a major division with two types of animal, one reptile-like and slow moving the other more mammal-like and fast moving, which raises the question, were dinosaurs warmblooded?

The Harvard University field station has been doing researches on how animals use oxygen, using a moving belt arrangement. A pony (mammal) has a very good system for using and distributing oxygen, and this gives the ability to move quickly but also to keep moving for prolonged periods. A large iguana

(reptile) given the same type of test has the ability to move fast, but only for very limited times, as it quickly runs out of oxygen. This is because reptiles have poor lungs and primitive hearts, unlike mammals which have very efficient hearts and well developed lungs. The University of Minnesota has also been working on a similar project. It is an oversimplification to say 'cold' or 'warm blooded'. Our body temperature is around 37° cent, while that of a reptile is held around 35° cent. We (mammals) use food to create heat to keep the body warmed. Reptiles use heat from outside to do the same job, but even so many lizards, for example, have developed means to 'fine tune' their temperature. By facing into the sun with raised scales they cause more shade on the body, but by facing away they can cause the scales to collect more heat and so raise temperature.

Work has been going on at the University of Paris for 11 years, into the make-up of fossil bones. They have developed a method for taking a very thin slice through the bone, this is then ground and polished to such an extent that it can be seen through. Even though the specimens are up to 150 million years old they are well detailed showing cells and capillaries, which provide valuable insights into the type of life lived. For comparison similar samples are taken from the bones of present day animals. The skeleton of a lizard is very like that of some dinosaurs but the bones show very densely packed cells, with no clearly visible boundaries. These are very different to a fox's, which show oval shaped cells with many blood capillaries. This is in keeping with the different life style of the fox (mammal), which has a much higher metabolic rate along with a much faster growth rate than a reptile. Over the years hundreds of specimens have been examined. There have been many individual differences, but a clear pattern has emerged. The fossil dinosaur shows the clear oval cell with abundance of capillaries similar to the present day mammal.

Warmblooded animals have many methods of regulating body temperature, panting, sweating, raising feathers to expose skin, are but a few. Professor John Ostrum started to look for similar signs in dinosaurs. One he studied was Stegasaurus which has upright plates on its back, placed in two staggered rows. These plates have large openings in their bases. Further examination by sectioning one of the plates, showed these were large bore canals surrounded by areas of small pores. Obviously they were not solid and used as armour as had been thought, but were capable of being flushed with large amounts of blood. Which points to them being used as radiators to regulate blood temperature. Yale University engineering faculty was asked to help. They used a wind tunnel, putting a heated model body in it and by fitting fins of different design found the most efficient ones. It turned out that a twin row of plates staggered in the manner of Stegasaurus was the best. Also the shape which is square with the corners cut off was proved to be the best. This showed that Stegasaurus could have been capable of very efficient control of body temperature.

Dr Dale Russell, of Ottawa University, is doing work on carnivorous dinosaurs. Along with studies at London Zoo, of their lions and their eating habits, which it is hoped will give clues to the eating habits of dinosaurs. A 300 lb lion will eat a 10lb joint of meat every day for six days a week, and in 5 weeks it will get through its own weight in steak. This is mainly used to

produce heat to warm the blood, as it is with most mammals. This is compared with the Nile Crocodile which is about the same body weight as a lion. The crocodiles go for long periods without food and overall only eat one eighth of the amount of the lion, 1lb fish to 6lb steak. This is reflected in the wild by the balance of nature, with a fish population supporting a large number of crocodiles. But it takes large numbers of prey animals to keep a few lions. Work done in various parts of Africa have also established these prey ratios.

Bob Barker uses these prey ratios to search for signs of warmbloodedness in the fossil record. He can go back millions of years before the dinosaurs, back to primitive reptiles. He checks numbers of obvious carnivores against numbers of possible prey animals. He has found the ratio to be high about 7 large carnivores to 8 large prey animals. Which is in keeping with a set-up involving coldblooded reptiles. Moving forward a few million years brings him to more mammal-like reptiles most of which show signs of being herbivores; there being very few carnivores. Wherever mammal-like reptiles show up the prey ratio drops. This is a powerful indication of endothermic evolution. This low prey ratio is maintained right upto and through the dinosaurs. Of the many good fossil collections studied nearly all gave ratios as low as the earlier ones, which were 10% to 5% with some as low as 3%. This is strong evidence that there were fast moving, heat producing dinosaurs, with large food consumption.

Critics of Bob Barker point out that very few bones become fossils, and this could lead to large errors in his calculations. But he points out that work being done in East Africa shows little difference in the way that the bones of predators and prey are incorporated into sediments. Also the ratios are worked out from many fossil collections, and the mammals and dinosaurs always have lower ratios than the primitive reptiles; the differences being very marked.

In 1970 Professor Ostrom was examining a fossil which had for years been labelled as a Pterosaur, a small flying reptile, when he noted the hind legs were too heavily made. On closer examination he found feather marks and established that it was an archaeopteryx. This was a great moment, as until then only three other examples had been found, and archaeopteryx is the earliest known bird. On further examination it struck Professor Ostrom that there was marked similarity to the front feet of some small carnivorous dinosaurs. This was strengthened by further examination of archaeopteryx and other fossils of small carnivorous dinosaurs. Thus led Professor Ostrom to the conclusion that birds as we know them probably evolved from a branch of the dinosaurs.

These theories are not as yet proved conclusively, but if dinosaurs were warmblooded it could explain why they were so successful for so long. Also why a family of them can live happily in the cold water of Loch Ness.

The Academy of Applied Science

Bob Rines and his team left some of their cameras in operation in the loch over the winter. This is a very difficult thing to achieve owing to the weather conditions. I hear that the camera in Castle Bay has been lost. This is the bay between Strone Point and Castle Urquhart on the south side of Urquhart Bay.

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It is about the area of a soccer pitch, and about 80 feet deep in the centre there is a ridge of 60 feet depth along the outer rim. Divers have been down and recovered the main mooring rope which seemed to have been cut at the surface. The camera 'pot' was on a secondary line, there was no sign of this, but the visibility was under six feet even though they had powerful lights. Also allowing for slack in the mooring rope the camera could be anywhere in a circle of up to 40 feet radius, or could have drifted off on its buoy. The cut rope is no real puzzle. There have been other cases of this type of thing over the years; in the past attributed to the work of night-time salmon poachers. Should the camera be found it is to be hoped it has not been damaged.

Odds and Ends

***** I have a letter from Paul Covell concerning an item or two from NIS 24. He liked the idea of a get-together but points out that members are scattered and finding a central rendezvous may be difficult. He suggested that a list of members be printed to allow members in the same areas to get together. His address is Sandstones, Old Lane, St. Johns, Crowborough, Sussex, TN6 1RX. Would anyone else like me to print their address, so that contacts can be made? On the matter of car stickers, he suggested (for recognition at the loch side) one of the green plastic strips for the top of windscreens with the letters N I S.

**** I also have word from Jacob McPherson, 1716 N. Willard, Altus, Oklahoma 73521 U.S.A., he asked for a list of US members so he may write to them. I've done it the other way anyone care to drop him a line?

That brings NIS number 25 to an end. With Christmas over, I would like to wish members a Happy New Year, and good hunting. Please remember news and views are needed. The address is:- R.R. Hepple, Huntshildford, St Johns Chapel, Bishop Auckland, Co. Durham. Telephone Wearhead 359. Subscriptions are U.K. £1.25 U.S.A./Canada \$7.00.

Rip.