



Above: The Iraqi ichthyosaur *Malawania anachronus* on 19th July 2007, moments before a pound hammer wielded by one of us (JL) under the watchful eyes of another of us (SDC) smacked the area marked by the dotted line, thus procuring the sample that confirmed Hughes' original 1979 diagnosis of 'Early Cretaceous (probably pre-Aptian) assemblage', constraining it further to Late Hauterivian-Barremian. This conclusively proved that this non-ophthalmosaurid lineage had successfully crossed the J-K boundary – despite the best efforts of Reviewer 2 to stop it. It should be noted that only one of the human figures is going backwards in this thrilling graphic representation of the struggle to publish. Life restoration of *Malawania anachronus* by Bob Nicholls paleocreations.com, coloured by C.M. Kosemen).

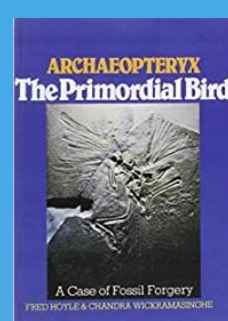
Pride, Preparation, Principle & Prejudice: The Tenet of Hoyle & Wickramasinghe as Applied to Marine Reptiles

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ABSTRACT: The death of Robert Appleby in 2004 brought to light a wealth of unpublished ichthyosaur research. Amongst this body of work was a description of the first ichthyosaur from Iraq, dubbed 'Iraqisaurus kurdistanensis'. Although the manuscript was sent to Palaeontology in 1979, doubts existed regarding the Jurassic age of the specimen. Archival correspondence was consulted and a fresh sample taken from the block, confirming the pre-Aptian Early Cretaceous results previously obtained by Norman Hughes for the specimen. When publication of the work was attempted, however, these results (indicating the survival of a non-ophthalmosaurid so far beyond the J-K horizon) were regarded as somewhat heretical by one reviewer, who became increasingly hostile as the manuscript progressed. Eventually, the editor and an arbiter overruled him, as it had become obvious that his resistance was fuelled less by flaws in the evidence presented, and more by his inherent belief that such things just 'could not be', unfavourably reminiscent of Hoyle and Wickramasinghe's blind belief that Archaeopteryx was a fake, simply because it did not fit their idiosyncratic views on evolutionary mechanisms. Following publication, the reviewer has repeatedly attempted to dismiss the specimen from consideration by Cretaceous researchers, through casting aspersions on the preparatory and sampling work done on the specimen. Acknowledging that academic prejudice against technical work has been a longstanding problem in palaeontology, it is hoped that more thoroughly documenting the sampling of the specimen here will lay the question of the dating of *Malawania anachronus* to rest once and for all.

Background: Fred Hoyle and Nalin Chandra Wickramasinghe were two astronomers who advocated 'Panspermia' – a theory that held that major evolutionary changes only happened through the agency of space microbes. The dictates of their model were such that they believed no birds could have existed prior to the Cretaceous – thus concluding that *Archaeopteryx* as a Jurassic 'bird' must therefore be a forgery...or series of forgeries. They then set out to prove – in a "nasty little book" (Euan Clarkson, 1986) published in 1986 that it had been faked. (Although Hoyle died in 2001, Wickramasinghe has maintained his advocacy of these principles, publishing in ScienceDirect's 'Advances in Genetics' in July on COVID as extraterrestrially-derived.) Their prejudice towards *Archaeopteryx* as a specimen that did not fit their model, so must have been faked, is a cautionary tale to all scientists who do not wish to allow actual facts to get in the way of their own really nice pet model theory.



PRINCIPLE

This story begins with a solid **principle** – that one scientist's extensive unpublished back catalogue of work should see the light of day, albeit posthumously. Robert Appleby was the leading European authority on ichthyosaurs, so was asked to edit the *Handbuch der Paläoherpetologie*, a task that increasingly took him from regularly publishing his scientific research, saving it all for his 'magnum opus'. This means that his publication record is not representative of the work that he undertook in the field. One of his uncompleted works was a manuscript on the first ichthyosaur from Iraq, which had been blocked from publication owing to problems in determining the age of the specimen.

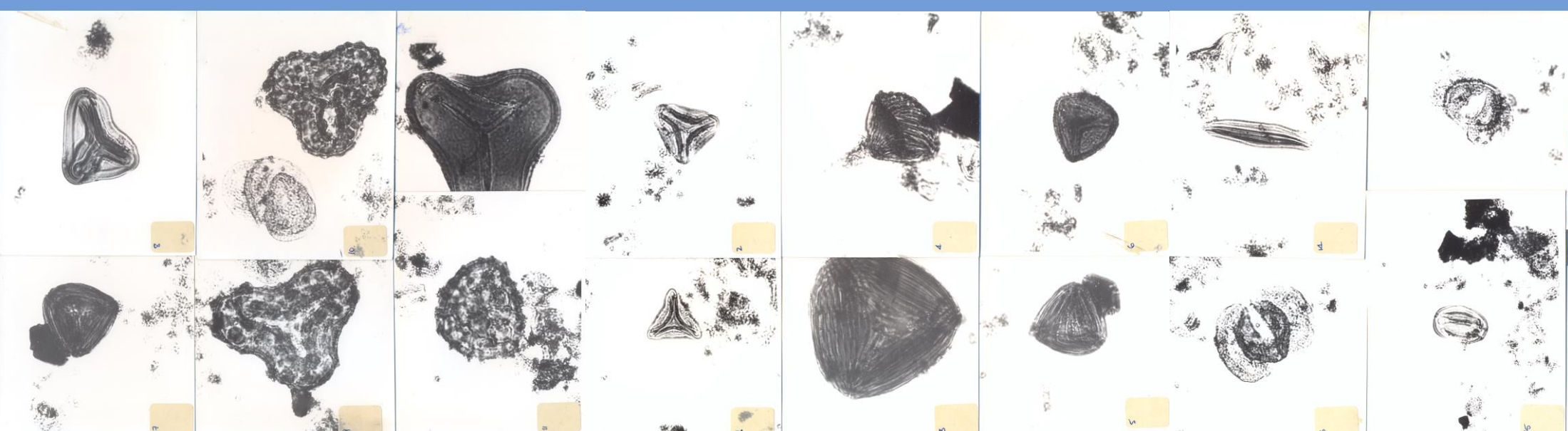
Right: The specimen - NHMUK PV R6682 - as discovered by D.M. Morton, F.R.S. Henson, R.J. Wetzel and L.C.F. Damesin in 1952, having been used to dam a small river near Chia Gara in Iraq. It was donated to the NHM in 1959 by Iraq Oil via Don Morton, and Robert Appleby began work on it in 1974.



PREJUDICE

Appleby considered that the specimen looked Triassic, so began looking for information about the local lithology. Much debate ensued over the local beds, the pivotal moment coming in March 1979, when the acknowledged authority on northern Iraq geology – HV Dunnington (who was not present at the discovery of the fossil) - told Appleby that the slab "may have been moved a short distance by the natives of Gara (village) to improve the mule track alongside the (intermittent) stream course. Because of its inconvenient weight and the attitude of 'effort conservation' which prevails in Kurdistan, it is highly unlikely that it has been moved more than a very short distance. They may have 'rolled it over laid it down and done it again' but not 'again and again and again.'" This fundamentally racist attitude henceforth excluded all the younger parts of the succession further upstream from consideration, it being tacitly assumed that the block must simply have come from the Sargelu Formation nearby. Work was then focused for the rest of the duration of the project on the accurate dating of the Rhynchonellid Beds in the Sargelu Formation in the valley – and, critically, not on dating the specimen itself, merely its presumed context. This derailed the next decade of research into wild goose chases concerning the nearby Sargelu deposits and their Bajocian or otherwise nature.

In June 1979, Appleby submitted his description to *Palaeontology*, the then editors Richard Fortey & Barry Cox returning it the following month, with his Middle Jurassic date having been scathingly (and anonymously) rejected by a palynologist describing the spore identifications (which were, again, not from the slab, but the beds in the area). Appleby then obtained microphotographs of spores sampled from the slab, sending them to Norman Hughes at Cambridge, the acknowledged authority on angiosperm origins, who was confused: he had been told to look at the images to determine how early in the Jurassic the specimen's age was...but the specimens clearly represent an Early Cretaceous (probably pre-Aptian) assemblage, not the Bajocian one that Appleby had led him to expect. He posits the question "did you perhaps send the wrong ones?" later in December reiterating "I now have to wonder if there was any mistake about them coming from your specimen". The presumption of a Sargelu-related age means that Appleby's team are utterly unprepared for the answer they receive on dating the actual slab, so appear to have assumed this came from a 'technical error' going forward.



In late 1979, new samples from the surface of the slab were sent to Hughes by the NHM, who confirms that there is a high amorphous organic content, but it is highly fragmented and of no use for diagnosis. In August 1980 Appleby returns the revised MS to PalAss, declaring to colleagues "It is about time this ichthyosaur [sic] was let loose on the world!" Again, it is sent back through doubt over the dating – Appleby now has ages of Lower-Middle Lias (rhynch), Upper Lias (rhynch), Bajocian (microfaunas/regional correlation), Upper Jurassic (fish) which he cannot resolve...NONE of which are from the slab itself. The only age he has ever obtained directly from the slab was Early Cretaceous (probably pre-Aptian) from Hughes. In December 1990, Appleby again attempted to resolve this question, for the *Handbuch* volume on ichthyosaurs – still trying to find an update on the age of the Rhynchonellid beds of the Sargelu Formation. What is tragic and so frustrating now, is that he clearly understood precisely the significance of the specimen: "From the vertebrate palaeontology point of view this specimen adds a late genus to the Family Ichthyosauridae. It also extends the geographical and ecological range of the family. From the point of view of evolution Iraqisaurus possesses features which are very primitive which survived from an early stage in the evolution of the family as well as having a few advanced features which no other ichthyosaur possesses. This makes it a collateral branch of Ichthyosauridae originating in either the lowest Liassic or the Rhaetic or possibly even earlier..." (R.M. Appleby, 12th December 1990)

PREPARATION

It was clear that if the description was to be published, then a new attempt would need to be made to try to resolve the specimen's age. At midday on 19th July 2007, a fresh sample was obtained from the ichthyosaur slab in the NHM conservation lab.

Right: 19th July, 2007 – NHM conservation lab, (L)11:47 (R) 12:02



The sample was crushed in the University of Glasgow's geology lab for treatment by one of us (SB). After adding it to hydrochloric acid to remove carbonates, it was then added to hydrofluoric acid to remove the remaining matrix. After a few days, the neutralisation of the liquid was begun by decanting off the acid and diluting it a few times before concentrating the residue in a centrifuge. This raw sample yielded an organic residue overwhelmingly dominated by amorphous organic material (AOM), identical to that observed by Norman Hughes in the sample that he obtained directly from the NHM in late 1979. This is consistent with the bituminous nature of this unit observable in the specimen. In order to isolate and concentrate the palynomorphs, the raw organic residue was sent to BGS, where it was separately oxidised using Schultze's solution and fuming nitric acid in order to break up and dissolve the AOM. This process yielded dinoflagellate cysts, pollen and spores; finally providing definitive results and allowing the age of the specimen to be determined with confidence by JB Riding of the BGS as Late Hauterivian to Barremian interval. Two Early Cretaceous formations, the Lower Sarmord Formation and the Lower Balambo Formation crop out nearby and represent likely source strata for the specimen.

PREJUDICE

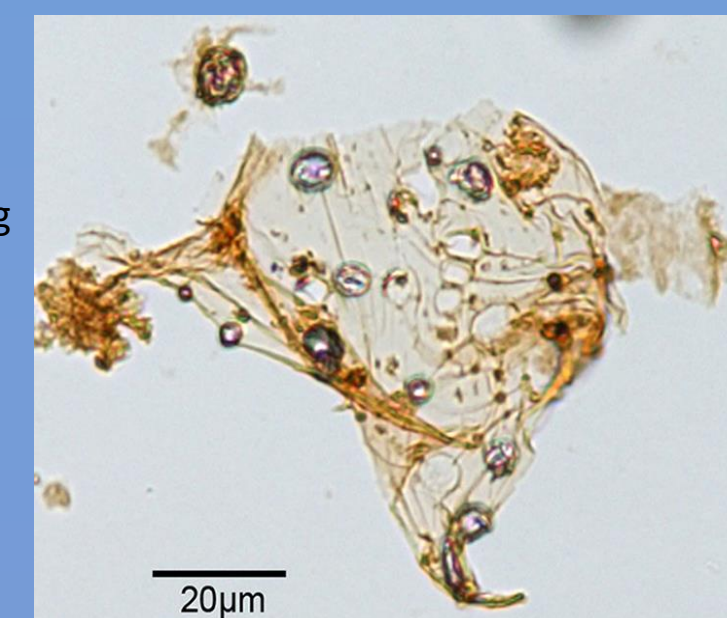
The submitted manuscript received a rough ride from Reviewer 2, who succeeded in having it rejected from *ProcB*. He asserted that one could not change evolutionary patterns with a single specimen, but needed hundreds, in spite of the fact that ghost lineages are established in that way every day in palaeontological publication. He also stated that the dating of the surrounding rocks was more important than the dating of the specimen slab itself – making the same mistake that caused Appleby to fall into the Sargelu trap over 30 years earlier. In spite of this, the specimen was published in *Biology Letters*. Reviewer 2 was invited to comment on the publication by *National Geographic* (Dell'Amore, 2013) and repeated his criticisms, attempting to retrospectively undermine the scientifically-accepted work. This was made worse the following year at a presentation at the EAVP conference in Torino, when PhD student Beatrice Fornaciari presented a new Early Cretaceous ichthyosaur, with a dataset that omitted *Malawania*. When questioned as to why, she explained that Reviewer 2 – who was one of her advisers – had told her that it had been wrongly dated so she should ignore it.

PRIDE & PRINCIPLE

Finally, this leads us to the reason for bringing this to the fore after publication. It is noteworthy that Reviewer 2 has never published anything attempting to counter our narrative. There is a **principle** at stake, that such criticism should not go unchecked – otherwise it passively enters the palaeontological community as an unchallenged (and therefore tacitly accepted) assertion. We also have **pride** in the work that we did, in order to bring another part of Robert Appleby's unseen legacy into the public domain.

Left: The original photomicrographs used by Hughes in 1979 for his original Early Cretaceous "probably pre-Aptian" diagnosis.

Right: The dinoflagellate cyst *Muderongia staurota* Sarjeant 1966, indicative of the Late Hauterivian to Barremian interval. Specimen lacking an operculum extracted from matrix of the slab containing the holotype of the Iraqi ichthyosaur *Malawania anachronus* (NHMUK PV R6682). Figured specimen number MPK 14374, curated in the palynology collection of the British Geological Survey (BGS).



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