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Researching 'Sea-Paths' Near Antarctica and in Psalm 8:8— Are Sea Creatures Actively or Passively 'Passing Through' Ocean Currents?

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Abstract

Recent research in coastal seawaters of Antarctica is expanding our data and understanding of ocean currents, what creationist oceanographer Matthew Maury called "paths of the seas" (based upon his study of Psalm 8:8). Philological study of that verse (i.e., Psalm 8:8, numbered as Psalm 8:9 in the Hebrew Bible) adds clarity to what is "passing through" those oceanic sea-paths, plus that verse's Hebrew verb refers to continually active (i.e., cross-current) movements at sea.

Key Words: Oceanography, ocean currents, "paths of the seas," Matthew Maury, Psalm 8:8, transgression, fish

Documenting What the 'Paths of the Sea' Are

Oceanic sea-paths, better known as ocean currents, were seriously studied and documented by the "father" of oceanography, creationist Matthew Maury, during the 19th century A.D., due to Maury's appreciation for the mention of "paths of the seas" in Psalm 8:8 (Maury, 1855; Lewis, 1927; Gish, 1993; Johnson, 2015).

For generations Maury's oceanography data served as the foundation of oceanography (Johnson, 2015). Nowadays that empirical science foundation is covered over by accruing oceanographic data. Modern data is acquired with greater precision and depth than was previously possible, facilitated by improved technology for such global research—thanks to satellite-linked robots and even southern elephant seals equipped with GPS-linked data transmission devices.

For example, Swedish researchers have recently reported some newly documented "paths of the seas" (Maury, 1855, page 57)—thanks to some helpful (and high-tech) southern elephant seals, plus some satellite-linked "glider" robots.

> Using state-of-the-art ocean robots and scientific sensors attached to seals, researchers in Marine Sciences at the University of Gothenburg have for the first time observed small and energetic ocean currents in the Southern Ocean.… Two new studies [led by Dr. Louise Biddle and Dr. Sebastiaan Swart] use highly novel techniques to collect rare data in the ocean both under and near the sea ice surrounding Antarctica (*www.roammiz.com*).… These papers present for the first-time upper ocean currents of approximately 0.1–10 km in size. These currents, which are invisible to satellite and ship-based data, are seen to interact with strong

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> Southern Ocean storms and with physical processes occurring under sea ice. (Eliasson, 2020)

Discovering such huge ocean currents under sea ice near Antarctica's shoreline is obviously very cool research (pardon the pun). In the *Journal of Geophysical Research: Oceans*, Sweden's Dr. Louise Biddle and South Africa's Dr. Sebastiaan Swart report on such seals:

> Using instrumented seals, we present the first known observations of submesoscale fluxes [i.e., subsurface-flowing currents] from late austral summer through to spring in and near Antarctic sea ice. Our findings show that these small-scale processes can have a strong effect on the upper ocean and can cause the mixed layer depth to shoal even in the middle of winter. There is also a clear seasonal cycle in the magnitude of the submesoscale activity. (Biddle & Swart, 2020)

The research was focused on underwater currents in Antarctica's marginal ice zone waters. As noted above, nineteenth-century oceanographer Matthew Maury called these currents "paths of the seas," a phrase taken from *Psalm* 8:8.

Yet the energetic subsurface ocean currents were documented under sea ice (during Antarctica's winter), showing that these near-the-surface flowing "rivers" are much more forceful and complicated than previously imagined.

As Christ's bioengineered creatures, seals are amazing cold-water mammals—a fact already well-documented by ICR scientists (Thomas, 2010; Johnson, 2020a).

Recently, 14 southern elephant seals were harnessed with environmental tracking equipment, to act as at-sea research assistants, helpfully collecting underwater measurements (i.e., hydrographic data) in seawaters not far from Antarctica's coastline. This complex data-gathering project thus illustrates how humans, made in God's image, can design and make continuous environmental tracking (CET) equipment, to learn about Antarctic shorewaters, with the assistance of southern elephant seals, who themselves have built-in (i.e., God-endowed) CET phocid anatomies and physiologies, that help them to fit and to "fill" those same seawaters (Guliuzza, 2017; Guliuzza, 2019; Johnson, 2020a).

> "Using the data collected by the seals, we're able to look at the impact these upper ocean currents have underneath the sea ice for the first time. It's a really valuable insight into what was previously completely unknown in the [eastern Weddell Sea portion of the] Southern Ocean," says Dr Louise Biddle, Department of Marine Sciences, University of Gothenburg. The winter had [been] assumed to be a "quiet" time due to the dampening effect of sea ice on the ocean's surface. However, the two studies show that these upper ocean currents have a significant effect on the ocean during winter. (Eliasson, 2020)

These new oceanography discoveries were published in *Geophysical Research Letters* (Swart et al., 2020) and in *Journal of Geophysical Research: Oceans* (Biddle and Swart, 2020). The research could not have been accomplished without the satellite-facilitated environmental tracking equipment that the Swedish University of Gothenburg research team used, with the help of high-tech equipment-bearing southern elephant seals, plus programmable underwater robots.

> Some of the findings by Sebastiaan Swart and his team gives further insight how these observed ocean currents work. Their study highlights that during times when there are no storms and winds are weak, upper ocean currents start to become much more energetic. This energy enhances the rate of ocean mixing and transport of properties, like heat, carbon and nutrients, around the ocean and into the deep ocean. (Eliasson, 2020)

The data gleaned from sensors, harnessed to navigationally sophisticated seals (Thomas, 2010; Johnson, 2020a), was complemented by robot-acquired data using satellite technology.

> "These new ocean robots, so-called gliders, which we control by satellite for months at a time, have allowed us to measure the ocean at unprecedented high resolution." [Quoting Dr. Sebastiaan Swart] … The glider can dive to 1000 metres and send back information via satellite to the researchers working close to the ice edge.… A deep diving ocean robot deployed in the Southern Ocean in rough weather from the South African Ice Breaker … spent five months in the ocean to collect data and transfer them to the researchers via satellite. (Eliasson, 2020)
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> We observe salinity-dominated lateral density fronts occurring at sub-kilometer scales.… Satellite radar imagery shows evidence of 1–10 km eddies and jets in the ocean adjacent to the sea-ice edge around Antarctica. We use field observations of temperature, salinity, and wind speed from autonomous robotic platforms deployed in the sea-ice zone for >3 months. These measurements provide estimates of the surface ocean density fronts which are controlled primarily by lateral variations in salinity. (Swart et al., 2020)

This gives a new twist to the phrase "uncharted waters," because this new research is providing new documentation to the *subsurface currents of the ocean* near Antarctica. This again illustrates that Psalm 8:8 was literally referring to the "paths of the sea" (Maury, 1855; Johnson, 2015).

It's good to learn more about the "paths of the seas"—and to appreciate how they all demonstrate how caringly and carefully God has orchestrated the

many moving parts of His creation (Thomas, 2010; Johnson, 2020a).

But that discovery would not surprise Genesis-affirming creationists, such as "Pathfinder" Maury, who intentionally looked to Scripture to understand creation (Lewis, 1927; Gish, 1993; Johnson, 2015). The reverent pioneer oceanographer-meteorologist well knew scientists' need to study with the Holy Bible open:

> I have been blamed by men of science, both in this country [i.e., the USA] and in England, for quoting the Bible in confirmation of the doctrines of physical geography. The Bible, they say, was not written for scientific purposes, and is therefore no authority in matters of science. I beg pardon! The Bible IS authority for everything it touches. What would you think of an historian who should refuse to consult historical records of the Bible, because the Bible was not written [solely] for the purposes of history? (Lewis, 1927, p. 99)

Meanwhile, modern oceanographers and marine ecologists continue to investigate how ocean currents interact with "whatsoever passes through the paths of the seas" (Psalm 8:8b, KJV).

> Ocean currents have many profound impacts on marine life, moving not only animals and plants around the ocean but also redistributing heat and nutrients. While some of these impacts have been well known for many decades, there have been major recent developments in this area. Biologists are increasingly collaborating with physical oceanographers. At the same time, methods to accurately predict ocean currents and their variability have improved over a broad range of spatial and temporal scales. Emerging from these initiatives is an understanding of how currents impact the connectivity of marine populations, how they influence the migration of strong swimmers, including whales and turtles, and how changing currents … [can] re-shape entire communities … The impacts of ocean currents in transporting passive drifters and deflecting large migrants has many parallels with the impacts of wind on the transport of insects and seeds as well as the deflection of migrating birds. (Hays, 2017)

This efficiency in moving underwater, at sea, is seen in both fish, such as salmon, as well as in diving seabirds, such as alcids—like puffins and murres—showing Christ's bioengineering genius as does also the aerial movement-through-fluid wonders of migratory birds (Johnson, 2020b, 2020c, 2021).

Discerning What Sea-Path 'Passing Through' Is

So, is Psalm 8:8 referring to ocean-faring animals, such as zoöplankton (such as ciliates and dinoflagellates), somehow "going with the flow" of the sea-paths, passively—or, is that "passing through" a description of sea-faring animals actively swimming cross-current, transgressing (i.e., traveling across) the sea-paths?

Of course, some sea-life (such as zoöplankton) passively drift within oceanic tides, as others quasi-passively take advantage of oceanic currents (i.e., floating, drifting), such as the Gulf Stream, to minimize metabolic expenditures when migrating. However, contrastingly, anadromous fish such as Pacific and Atlantic salmon—are conspicuously famous for aggressively swimming across (i.e., against) ocean currents, in order to intentionally migrate to spawning destinations.

So, what is the original Hebrew text of Psalm 8:8 actually saying about "passing"?

The critical phrase for answering this question is the phrase translated "whatsoever passeth through the paths of the seas" (KJV), so a quick philological review thereof follows below.

The English phrase "whatsoever passeth through the paths of the seas," in Psalm 8:8 (i.e., Psalm 8:9 in the Hebrew Bible), translates the phrase *'ōbēr 'ârḥôt yammîm*, which follows the phrase "and the fishes of the sea" (*ûdegê hayyâm*)—without the Hebrew conjunction meaning "and"—showing that "the fishes of the sea" are *not* a different animal-group category from "whatsoever passeth through the paths of the seas. In fact, the phrase "passes through the paths of the seas," translating *'ōbēr 'ârḥôt yammîm*, because it contains no definite article in the original Hebrew text, is more literally translated as "passing through paths of seas," i.e., "*moving across* paths of seas."

The verb "passing" (in Psalm 8:8) is a *pôêl* (*qal* active participle), denoting ongoing continuous action. The underlying Hebrew verb is 'âbar, meaning "to pass over" (as in Genesis 33:3; Joshua 3:16 & 4:13), "to transgress" (as in Deuteronomy 17:2 & 26:13; Joshua 7:11 & 7:15; Judges 2:20; 1st Samuel 15:24; Isaiah 24:5; Daniel 9:11; Hosea 6:8 & 8:1), "go over" (as in Numbers 32:21; Deuteronomy 12:10), "come over" (as in Deuteronomy 2:14), "pass through" (as in Genesis 12:6 & 15:17; Exodus 12:12; Joshua 24:17), "pass beyond" (as in Judges 3:26), and the like (Wigram, 1874, pp. 895–899).

The related Hebrew word *'ēber*—translated "beyond" (as in Genesis 50:10–11; Deuteronomy 3:20 & 3:25 & 30:13; Jeremiah 25:22), and "yonder" (as in Numbers 32:19), and "on the other side" (as in Numbers 21:13), etc.—further indicates that the marine fishes' positional relationship with the sea-paths involves crossing from one side to another, as if going through an intersection or as if crossing a boundary line (Wigram, 1874, p. 899).

In short, the italicized English words "and whatsoever" (in the KJV) are misleading, not corresponding to any of the original Hebrew text's words of Psalm 8:8. The King James Bible translators should, of course, be given credit for us-

ing italics to show which English words were supplied apart from corresponding Hebrew text.

In other words, the psalmist (i.e., David, according to the Hebrew Bible's first verse in Psalm 8) is using an active verb participle to describe *how* "the fishes of the sea" behave, as opposed to contrasting the category "fishes of the sea" with some other kind of sea-life (that is somehow "passing through the paths of the seas").

However, although Psalm 8:8 is referring only to "the fishes of the seas" (*degê hayyâm*), we must not jump to the conclusion that the Hebrew word "fish" (*dag*) equates to (i.e., is definitionally limited to) our English word "fish," taxonomically speaking, because the Hebrew word is more generalized, i.e., it would include what we call fish, sharks, cetaceans (including orcas, porpoises, dolphins, whales), and likely other sea creatures (Genesis 9:2; Numbers 11:22).

Also, the simple active participial form of the Hebrew verb *'âbar* (used in Psalm 8:8) denotes that the "passing" involves *passage across something*, i.e., passing over or through a river, or passage over or through a field of land, as well as an intangible crossing-over—"transgression"—such as transgressing moral boundaries of human behavior, established by God.

Since the context of Psalm 8:8 is seawaters (*yammîm*)—specifically, "paths of seas" (*'ârḥôt yammîm*)—the fishes' ongoing actions of "passing" within that seawater context is a continuation of activities that *cross sea-paths*, as opposed to continually drifting (passively) within or upon those ocean currents.

Is this cross-current fish migration what we observe at sea? In a word, *yes*.

> Animals ranging from *vertebrates*, such as turtles, to invertebrates, such as jellyfish, can be equipped with satellite tags and tracked in relation to the local currents.… [For example, consider small loggerhead sea turtles equipped for satellite-linked GPS tracking.] These young turtles are pelagic, living in the open ocean where they show directional swimming to avoid being carried to unfavorable areas. Adults often migrate thousands of kilometers across the open ocean between coastal breeding and foraging sites. While they have the swimming ability to overcome [ocean] currents, tracking data suggest they do not follow the optimum routes to make the best use of current flows.… [i.e., they cross "the paths of the seas" as they migrate long distances from here to there].
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> [This waterflow-resisting behavior is likewise exhibited by each] barrel jellyfish (*Rhizostoma* sp.) … equipped with a tracking tag ... [who show themselves as] surprisingly powerful swimmers and can adjust their swimming direction in relation to tidal flows to help avoid being carried away from coastal zones. (Hays, 2017, pp. R470–R473)

"The psalmist…is using an active verb participle to describe *how* "the fishes of the sea" behave, as opposed to contrasting the category "fishes of the sea" with some other kind of sea-life."

For examples of ocean-faring fish transgressing ocean currents—as opposed to passively drifting within sea currents—perhaps the most famous examples are anadromous Atlantic and Pacific salmon, when spawning (Thomas and Gaskill, 2012; Hays, 2017).

> Have you ever been lost and longed for a map and compass? God designed people in His image so that we can create navigational aids. But what if you were a salmon that had to swim to a precise spot hundreds of miles away—all without a guide? Fortunately, migrating salmon use at least three navigational tools that work in synchrony and demonstrate their marvelous design.
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> How do these fish find their way to the *exact same place* of their birth? By the mid-1980s, experiments had shown that salmon detect and remember the unique water chemistry of their origins. Young salmon "have a flexible system for learning olfactory waypoints at appropriate times and places." When heading downstream to the ocean, they [smell and] record the water chemistry along the way so that they can later retrace their path in reverse.
>
> Salmon use their extremely precise olfactory senses to zoom in on the exact location of their spawning ground, but they first have to navigate to the general area. In a 1998 experiment, researchers transported hatchery-raised sockeye salmon, some of them blind, several kilometers away from the area of their birth in Japan's Lake Toya. The sighted fish quickly navigated right back to their place of origin, while the blind fish swam randomly for most of the day. The authors wrote, "It is surprising that the fish identifies his position in open water and the direction of the natal [birth] area with such a high degree of accuracy." So, the second navigational tool—the primary one for salmon—

is a polarized light compass. A 2003 study of salmon's polarized light compass stated, "When the sun is lower on the horizon…the position of the sun can be determined unambiguously by the distribution of polarized light." Exactly how the fish determine the distribution of polarized light, measure its angle, and use that information to navigate is not yet known.

But how would salmon navigate at night or under cloud cover? Like any good engineer, the Lord Jesus designed salmon with redundant technologies. Salmon possess a third navigational tool—a magnetic compass. These amazing fish can navigate by comparing their directional heading to a magnetic map of their surroundings. Authors of a 2005 study had a hard time imagining that a single device could do all this. They wrote, "Likewise, a mechanism designed to record tiny changes in intensity can, at the same time, hardly measure the direction of the magnetic field with great precision." However, a 2012 report showed that salmon's magnetic receptors detect both!

Single cells act like compass needles, having a microscopic collection of magnetite crystals at one end. They constantly pull toward magnetic field lines, thereby stressing surrounding detector cells as the salmon turns. According to these authors, the cells in this single system are "therefore not only sufficient to detect the direction of magnetic north but also likely to form the basis of an accurate magnetic sensory system with which to extract positional information." (Thomas and Gaskill, 2012, p. 17)

As the foregoing quotation of biologists Thomas and Gaskill notes, as well as the following quotation of ecologist Johnson, the providential bioengineering that enables anadromous salmon to return to their "birthplace," across the sea-paths and upstream, is the exact opposite of "going with the flow."

> Swimming upstream is not easy—just ask a salmon. Why not just lazily drift along with the current? 'Going with the flow' looks much more attractive and is certainly much more popular. Why struggle so much? That's an important question for a salmon, who must battle its way sometimes hundreds of miles against strong currents in order to reach its spawning grounds. (Johnson, 2011)

Meanwhile, modern oceanographers and marine ecologists continue to investigate how ocean currents interact with sea-life that is passing *through the paths of the seas*. Unsurprisingly, our growing understanding of oceanology likewise continues to corroborate what the Holy Bible teaches about those living sea creatures who—actively and continually—cross through ocean currents as they live out their underwater lives (Johnson, 2020b, 2020c).

Summary

Recent research in coastal seawaters of Antarctica is expanding our data and understanding of ocean currents (what Matthew Maury called "paths of the seas"), building upon the pioneering oceanographic foundation of what creationist Matthew Maury's Psalm 8:8-based empirical studies of ocean currents. Philological study of Maury's keystone verse (i.e., Psalm 8:8) clarifies that the sea creatures therein mentioned are just that, sea creatures—called "fish" in the Old Testament, translating Hebrew text that is not limited in meaning to our taxonomic term "fish" as we now use that term in English. In other words, the sea creatures are what David (as the psalmist who authored that verse) is describing. The continuous actions of those sea creatures (most of which we would classify as "fish," yet some of which could be sharks, dolphins, whales, and likely also cephalopods like octopi and squids) are reported (by David the psalmist) as "passing through sea-paths"—which refers to the active cross-current swimming of fish (and other sea creatures) whose intentional destination-oriented swimming contrasts with the *passive drifting* of zoöplankton. In other words, the "fishes of the seas" (who are mentioned in Psalm 8:8, and are not limited to what are defined by the English word "fish") are continually and actively *passing across ocean currents*, at and below oceanic seawater surfaces, as they swim directionally toward places where they aim at arriving, e.g., as illustrated by the against-the-flow migration of anadromous salmon during spawning season.

References

Biddle, L.C., and S. Swart, 2020. The observed seasonal cycle of submesoscale processes in the Antarctic marginal ice zone. *Journal of Geophysical Research: Oceans* 125(6):e2019JC015587.

Eliasson, C. 2020. Unknown currents in Southern Ocean have been observed with help of seals. University of Gothenburg. *Science Daily*. Posted on *marine.gu.se* June 23, 2020 (and also on *phys.org/news*). https://www.sciencedaily.com/releases/2020/06/200626114754.htm.

Gish, D. 1993. Paths of the Seas. *Days of Praise*. Posted on ICR.org: October 6, 1993, (accessed June 30, 2020).

Guliuzza, R.J. 2017. Engineered adaptability: Engineering principles should guide biological research. *Acts & Facts* 46(7):17–19.

Guliuzza, R.J. 2019. Engineered adaptability: Continuous environmental tracking wrap-Up. *Acts & Facts* 48(8):17–19.

Hays, G.C. 2017. Ocean currents and marine life. *Current Biology* 27(11):R470–R473.

Johnson, J.J.S. 2021. Christ's providence is clearly seen in bird migrations. *Acts & Facts* 50(12):20. Posted at www.icr.org/article/christ-providence-clearly-seen-bird-migrations.

Johnson, J.J.S. 2020a. Common seals display extraordinarily uncommon bioengineering. *Creation Science Update* Posted at www.icr.org/article/common-seals-display-extraordinary-bioengineering.

Johnson, J.J.S. 2020b. Alaskan alcids: Efficiently designed for air and water. *Creation Science Update* Posted at www.icr.org/article/12308/.

Johnson, J.J.S. 2020c. God's plan is best: Salmon need saltwater acclimation. *Creation Science Update*. Posted at www.icr.org/article/god-plan-is-best-salmon-need-saltwater-acclimation.

Johnson, J.J.S. 2015. An oceanographer's insight, for researching and analyzing oceanic and littoral ecosystem dynamics, guided by 'high-definition' Biblical philology. Presented at the *Creation Research Society* Conference (Dallas, Texas: July 31,2015).

Johnson, J.J.S. 2011. Culpable passivity: The failure of going with the flow. *Acts & Facts* 40(7):8–10. Posted at www.icr.org/article/culpable-passivity-failure-going-with.

Lewis, C.L. 1927. *Matthew Fontaine Maury: The Pathfinder of the Seas*. Annapolis, MD: U.S. Naval Academy / Kessinger Legacy Reprints.

Maury, M.F. 1855. *Physical Geography of the Sea and its Meteorology*. 2003 reprint of 1855 text. Mineola, NY: Dover Publications.

Swart, S., M.D. du Plessis, A.F. Thompson, et al. 2020. Submesoscale fronts in the Antarctic marginal ice zone and their response to wind forcing. *Geophysical Research Letters* 47(6):e2019GL086649.

Thomas, B. 2010. Seal whiskers track fish trails. *Creation Science Update*. Posted June 30, 2020. www.icr.org/article/seal-whiskers-track-fish-trails/.

Thomas, B. and P. Gaskill. 2012. Swimming upstream: Navigation systems in migrating salmon. *Acts & Facts* 41(10):17. Posted at www.icr.org/article/swimming-upstream-navigation-systems.

Wigram, G.V. 1874. *The Englishman's Hebrew Concordance of the Old Testament*. 2013 reprint of 1874 original text. Peabody, MA: Hendrickson Publishers.