Geopolitics in the search for the disappeared Malaysian Airlines Flight MH370

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Abstract: Malaysian Airlines Flight MH370 flying on a routine flight from Kuala Lumpur to Beijing disappeared in the early morning of 8 March, 2014. The last radar-tracked position of the aircraft was some 400 km off Penang Island. After nearly three years of oceanic search of the anticipated crash site of MH370 in the area off the western coast of Australia, absolutely nothing tangible has been found to date. In mid 2015, some debris of the missing aircraft were found off the coast of southeastern Africa. The origin of the recovered flotsam (of MH370) could have been almost anywhere in the western half of the Indian Ocean. The probable crash site might be better identified if the fundamentals of the causes of the crash were examined additionally from the viewpoint of prevailing geopolitics and social psychology of the pilots.

Keywords: air flight; Australia; disappearance; geopolitics; Indian Ocean; Malaysian Airlines.

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Biographical notes: Alfred Wong is a researcher associated with the Friends of Aboriginal Health in Vancouver, Canada. He has been engaged in research in issues involving the politics of human rights, social justice and environmental protection, for more than 30 years.

1 Introduction

Nothing will come of nothing

King Lear, Act 1, Scene 1: 89

(*William Shakespeare, ca. 1605-1606*)

Trust no one, Suspect everything

generally attributed to V.I. Lenin, ca. 1920.

It has been more than three years since the disappearance of MH370. Malaysian Flight MH370 with 239 people on board left Kuala Lumpur airport at 0041 h. (local time), 8 March, 2014 for Beijing. The planned flight path was due north crossing Vietnam en route. There was sufficient fuel loaded for a 7-hour flight. At 0119 h., the aircraft made

an inexplicable left turn over the Gulf of Siam towards Palau Langkawi (Malaysia). MH370 terminated its radio voice contact with Malaysian flight control as it left Malaysian air traffic control territory at 0119 h local time. The final cockpit voice communication recorded was "Good Night Malaysian three seven zero". There was no immediate continuation of cockpit voice contact with the Vietnam air traffic control station in Ho Chi Minh City. The aircraft transponder and other telecommunication equipment were apparently switched off shortly thereafter. As tracked by Malaysian military radar, MH370 apparently made a sharp left turn at 0215 h local time in flying past Palau Langkawi at the northern end of the Malacca Strait. Within a few hours of this lost contact, there was a frenzy aerial search in the Gulf of Thailand, and then in the north end of the Malacca Strait in the following days. No floating debris of MH370 was found at either search location. Andaman Islands, Maldives, Mauritius and even Tajikistan were mentioned initially as possible destinations of the missing MH370. Then the news media were fed to report that MH370 had apparently made another left turn in the southern direction after the last radar-tracked position, and had probably plunged into the southern Indian Ocean after it had ran out of fuel. A highly publicised international effort was subsequently mobilised to search for the missing airliner. Australia stepped forward to take the lead in this multi-national search far off the coast of Western Australia. Some 12 days after the disappearance of MH370, some very grainy satellite photographs were released by the Chinese and French governments purportedly to show debris from the missing airliner. These low-resolution images appeared to be very amateurish. Perhaps China and France were purposely camouflaging the true capability of their military spy satellites. Other military powers with equal or superior satellite surveillance capabilities were conspicuously silent. Nevertheless the debris shown in these low-quality images was later identified to be merely generic trash from human activities in the high sea. The last civil aviation radar contact was at 7° 1′ 12″ N, 103° 40′ 48″ E, and the last Malaysian military radar contact was at 6° 35′ 53″ N, 96° 17′ 38″ E, at 0215 h. flying in the northwest direction, near the vicinity of Palau Langkawi. Thereafter, the aircraft 'disappeared'.

Two weeks after the disappearance of MH370, INMARSAT Plc with the collaboration of the British government suddenly claimed that the analysis of its satellite electronic signal data confirmed the appropriateness of the search area off the coast of Western Australia (AAIB, 2014). The electronic 'ping' from equipment on board MH370 and purported visual sighting of debris were brandished almost daily in press releases until early April. In the six months since the disappearance of MH370, absolutely no physical objects had been found (Hunt, 2017a).

What is known to date in the highly-publicised search is that 1) nothing has been found after a large sum of money had been spent on searching the southern Indian Ocean off the southeastern coast of Australia (ATSB, 2016a, 2016b; ATSB, 2017a), and 2) several presumably MH370 aircraft debris have been found accidentally by ordinary people on beaches along the southeastern coast of Africa, since mid 2015 (de Changy, 2015; Anon. 2015b). The official search led by the Australian Transport Safety Bureau (ATSB) was suspended in March, 2017 (Hunt, 2017c; Phillips, 2017). The ATSB released its final report on October 3, 2017 to conclude that it has failed to find the crash site after more than three years of oceanic search (ATSB, 2017b).

The causes of the final flight path are still largely conjectures. Electrical-mechanical failures, high-jacking by on-board intruders or by external electronic means and irrational planned or unplanned behaviour of the pilots are among the most commonly cited

conjecture. To date, there have been little or no public discourse on the causes due to, among other things, the prevailing social psychology (see, for example, Douglas and Munn, 1992; Olson, 2005) of the pilots and the geopolitical elements of investigating this civil aviation crash.

Since the first day of the disappearance of MH370, numerous 'conspiracy theories' have manifested in many hard-print and Internet based publications (see, for example, Choisser, 2014; Kahli, 2014; Taylor and Wilson, 2014; Belzer et al., 2015; Soucie, 2015). The emergence of these alternative conclusions, substantiated or not, was not unexpected. In the realm of contemporary politics, evasive and untruthful pronouncements by officialdom often under the guise of 'national security' are largely contributory to the manifestation of multiple conspiracy theories.

In view of the failure of locating the crash site over the past 3 years, there is an acute need to begin anew the investigation of the disappearance in the fashion of standard forensics such as those described by, for example, United States Department of Justice (2000), Julian et al. (2012) and Ward (2013). The new comprehensive undertaking should include all direct and circumstantial physical, sociological, political and psychological evidence pertaining to motives and opportunities. It is important to note that 'crime scene' can be staged for a variety of reasons including misdirecting investigation purposely or to cast blame on others (see, for example, Douglas and Munn, 1992; Gerberth, 1996; Turvey, 2000; Caso et al., 2005; Ferguson, 2010; Chancellor and Graham, 2014; Pettler, 2015; Augenstein, 2016). It is generally known that in most crime scene investigation anywhere in the World, unbiased thorough investigation and subsequent vigorous prosecution are often hampered by political interferences.

The aim of this paper is to assess the possible locations and causes of the disappeared Malaysian Airlines Flight MH370 in the context of geopolitical and social psychological elements of the disappearance and subsequent search for the missing large passenger aircraft.

2 Methods

The present approach would be to consider the disappearance as an accident, suicide or homicide, or combination thereof. Relevant publicly-available information including printed and web-based newspaper reports, and published scientific papers and studies. Reasoned judgement on the basis of known scientific principles was deployed routinely in the consideration of the use (or rejection) of certain publicly-available information.

There is unfortunately an acute paucity of detailed scientific reports and journal publications in the public domain. Certain reliance on (regrettably unverifiable in many instances) newspaper papers, in print as well as web-based, became unavoidable. Many mass media often rehash news reports delivered by news agencies such as Reuters, Agence France-Presse, Associated Press, etc. which in turn often rely largely on official press releases for their news stories (see, for example, Murray et al., 2002). An example is the almost verbatim report of Quest (2016) on the search for the missing aircraft on the basis of news feeds from officialdom. But for various reasons, Officialdom might not have been truthful in the disclosure of information in press releases. With numerous vested commercial and/or geopolitical interest of many parties concerned in the disappearance of MH370, vital data could have been distorted, manipulated, and/or

hidden intentionally to render difficult analysis (see, for example, Marchetti, 1989; Aro, 2016).

In view of the limitations of the quantity and quality of veritable information, the scope of the present analysis is restricted to the development of an alternative hypothesis of the final crash site of MH370. The findings of this study would thus not necessarily meet the legal standards of any court proceedings.

3 Results and discussion

In consideration of thousands of popular news stories, Internet postings, scientific reports, book and journal publications, there are basically two principal hypotheses about the site of the crash of MH 370 in the early hours (Malaysian time) of 8 March, 2014:

Hypothesis 1: MH 370 had crashed in the southern Indian Ocean, more than 1,500 km west of Perth, Australia.

Hypothesis 2: MH 370 had crashed elsewhere, in the northern Indian Ocean, perhaps in the area of the Chagos Archipelago.

Each hypothesis is supported by its own set of circumstantial evidence of variable verity.

3.1 Hypothesis 1

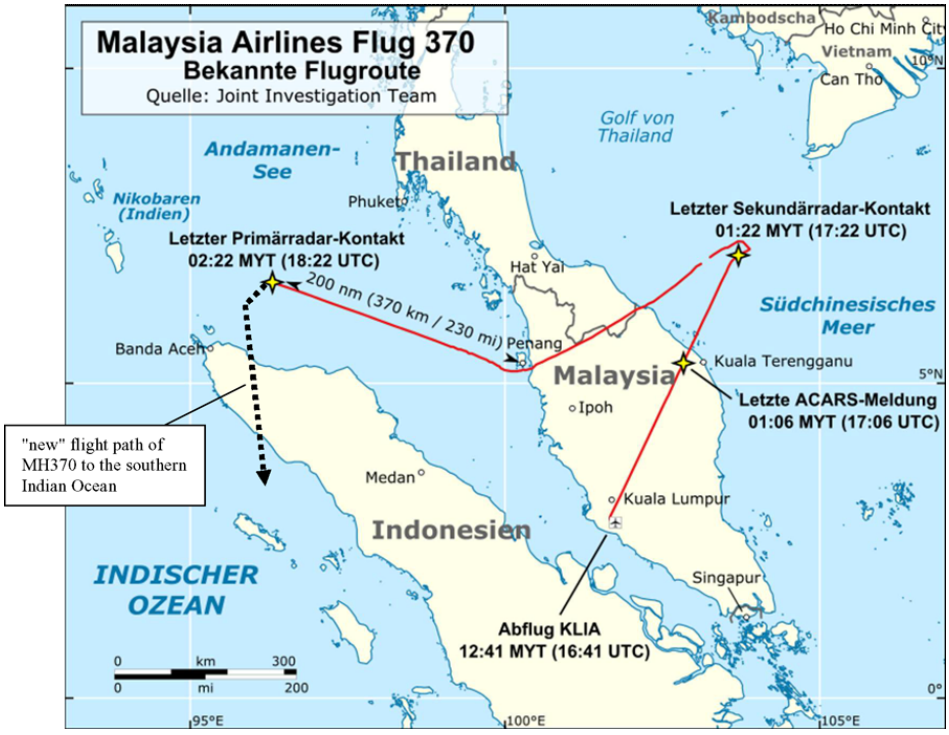
In this hypothesis, the underlying premise of this highly publicised search led by Australia relies solely on the information provided by INMARSAT, a British satellite telecommunication company (ATSB, 2014a). The INMARSAT-3 F1 is a geo-stationary telecommunication satellite positioned directly over Diego Garcia (7.3º S, 72.4º E). The telecommunication satellite emits a ping[1] every hour to a moving or stationary target to verify its viability or existence. The two Rolls Royce jet engines of the missing aircraft might have been equipped to transmit routinely their operational conditions, with identification tag, to Rolls Royce headquarters in the UK (Anon., 2010). If such a reporting system was indeed functional, then the viability of the missing aircraft could have been confirmed continually even after the ACARS[2] was shut down at 1706 UTC[3] in the vicinity near Kuala Terengganu (east coast Malaysia). Thus, the continued flight of MH370 in whichever direction until 0016 UTC, the time of the reported last ping, could have been detected easily. Interestingly, this forensic clue has yet to be followed by the official search organisation.

The last Malaysian military radar contact of MH370 was at 1822 UTC. According to data released by INMARSAT, the first ping emitted was at 1825 UTC, and the last ping was emitted some 6 h later at 0019 UTC. For the said elapsed time, MH370 (Boeing 777-200ER; fly-by-wire system with control yoke which is operated by pilots on command) would have flown approximately 3600 km, at the representative cruising speed of 890 km per hour. The most northerly and southerly search area (between ~32º S and ~39º S) is located at ~4200 km and ~5000 km respectively,[4] southeast of the last Malaysian radar contact near Palau Langkawi (6.3º N, 99.5º E). The aircraft had been fueled to fly about 4400 km (plus spare) from Kuala Lumpur (3.1 N, 101.6 E) to Beijing (40.0º N, 116.4º E). Thus, it would be logical for MH370 to have crashed in the primary search area if it had

indeed ran out of fuel on a straight-line flight path from the Andaman Sea to the southern Indian Ocean.

The flight path southwest to Penang and then northwest from Penang is certainly puzzling. Note that MH370 would need to make a final sharp turn at 1822 UTC to fly to the southern Indian Ocean. Such aircraft manoeuvres, at about 1722 UTC and at about 1822 UTC, would not have been possible technically if there were catastrophic electronic and/or mechanical malfunctions of the aircraft. Figure 1 shows that MH370 had made these peculiar turns starting at about 40 min after departure from the Kuala Lumpur Subang airport. If MH370 was in technical difficulties, it could have easily landed at the Penang airport or Ho Chi Minh airport.

Figure 1 Re-constructed details of the final hours of MH370 flight path before its disappearance (see online version for colours)



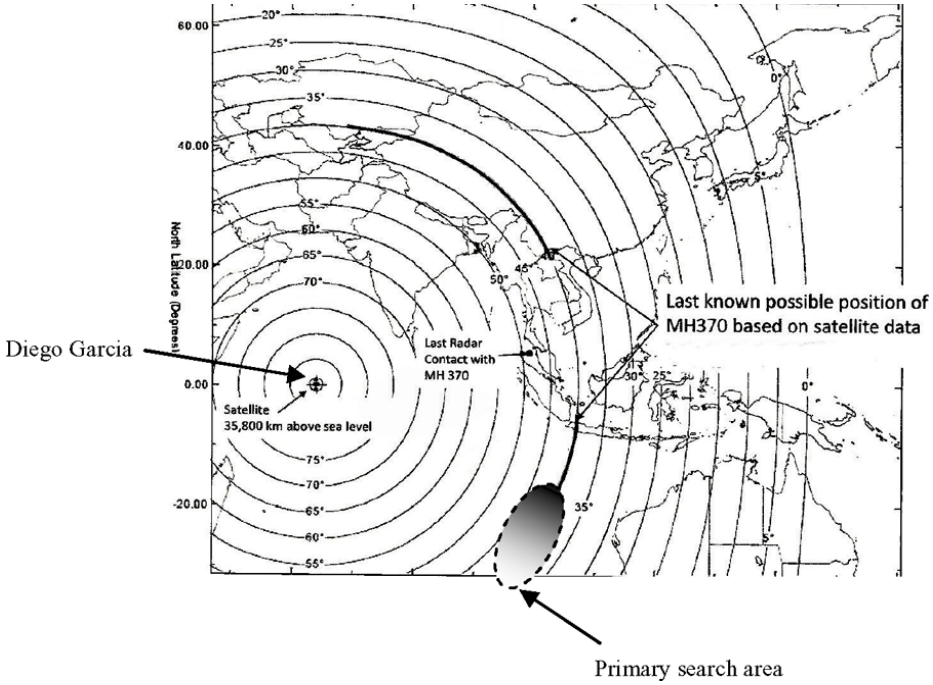
Source: Anon. (2017c)

It may be noted that if the MH370 pilots had intended to fly to the southern Indian Ocean, they could have done so at any time after the turn-around in the Gulf of Thailand at 1722 UTC. There was no particular reason for MH370 to fly first towards Penang-Palau Langkawi. It could have flown easily and directly via Kuala Lumpur or Singapore to crash in the southern Indian Ocean. In essence, catastrophic equipment failure is not plausible as the aircraft had too many sharp changes in flight direction.

3.1.1 Satellite based telecommunication data

According to INMARSAT data released about one week after the disappearance of MH370, the last electronic ping emitted by MH370 proscribed an arc along the western coast of Australia (AAIB, 2014; ATSB, 2014a; Zweck, 2014; Ashton et al., 2015). See Figure 2. A highly publicised aerial and underwater search was undertaken subsequently in the INMARSAT-suggested area in the southern Indian Ocean. All other hypotheses of the crash site appeared to have been summarily rejected (ATSB, 2014a). No question was raised about the veracity of INMARSAT data.

Figure 2 INMARSAT interpretation of satellite pings



Adapted from Lubin et al. (2014)

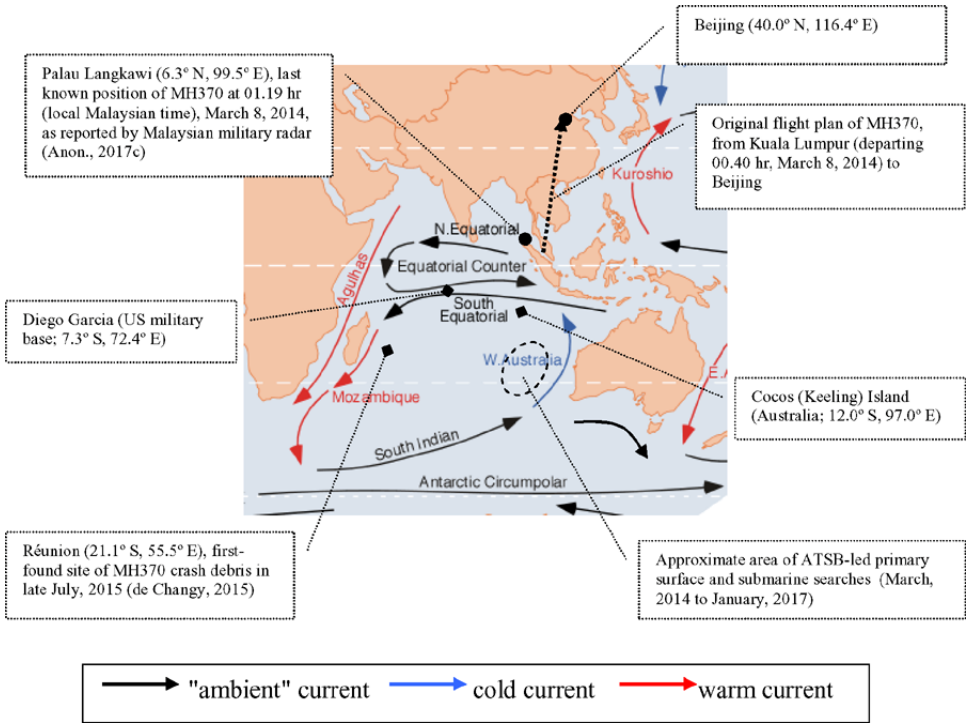
But could the INMARSAT information be trusted? Was the INMARSAT information fabricated or altered to fit a particular geopolitical agenda? An assessment of the history and current operations of INMARSAT suggests that the Company is closely linked to the British Government. About 20% of its gross income is derived from contracts with the USA government (see, for example, Arthur, 2014); the nature of these contracts is largely unknown. Indeed, some of the released INMARSAT data have been challenged vehemently to be misleading and erroneous by several telecommunication experts (see, for example, Hunt, 2017d). These critics have noted that there were notable technical errors in the analysis (see, for example, Shulman, 2014).

Nevertheless, the Australian government took control of the search for seemingly dubious reasons of "assisting the Malaysian Government". It is interesting to note that there were only a few Australian nationals (i.e., 6 out of 227 passengers and 12 crew members, according to the official flight passenger manifest[5]) on board the ill-fated MH370.

3.1.2 Ocean drift analysis

In July, 2015, one fragment from the missing MH370 was found accidentally on a beach in Réunion (de Changy, 2015). Trinanes et al. (2016) have subsequently constructed an ocean-drift debris scenario to 'reverse prove' the INMARSAT identification of crash site(s) to be impeccably correct. These researchers notably gave no consideration to any other plausible crash sites within the entire Indian Ocean. As shown in Figure 3, generally known surface and sub-surface oceanic currents in the Indian Ocean would have suggested that other crash sites would be equally plausible, notwithstanding of the INMARSAT-released data.

Figure 3 Ocean current map of Indian Ocean (adapted from various open sources) (see online version for colours)



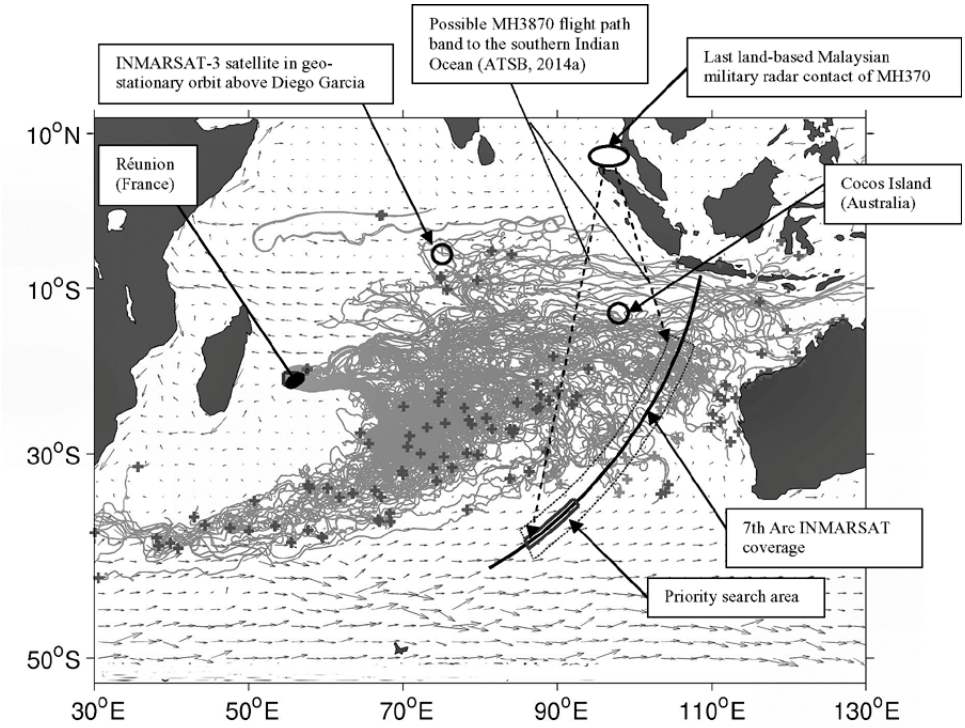
For example, if MH370 had crashed near, for example, Cocos Island, the debris would also have appeared in the southeastern coast of Africa, according to the hypothesis of Trinanes et al. And yet, the surface mixing of two principal ocean currents in the zone between Equator and 15° S, at about 75° E, has been inexplicably omitted by these oceanographic researchers. It is generally known that in the vicinity of 15° S, spanning between about 45° E and 110° E, intermixing of the eastward-flowing *Equatorial Counter Current* and the westward *South Equatorial Current* occurs ubiquitously. Even the *North Equatorial Current* could have carried debris to the southeastern coastal area of Africa. Australian researchers contracted by ATSB had also concluded that the primary search site was the likely crash location by the estimation of ocean drift of the flaperon found on Réunion in July, 2015 (Griffin et al., 2016; Griffin et al., 2017; Griffin and Oke,

2017a; Griffin and Oke, 2017b). To a certain extent, this finding appears to have been designed to justify an *a priori* decision of the candidate crash site for the oceanic search.

Separately, other independent oceanographic researchers have used various computer simulation methods to deduce the geographic origin of the debris found in Reunion in July, 2015 (see, for example, Garcia-Garrido et al., 2015; Jansen et al., 2016; Vozchikov, 2016). Researchers at GEOMAR Kiel had back-calculated of a computer-simulated flaperon from Réunion in July, 2015 to possible locations in the Indian Ocean on about 8 March, 2014 (Durgadoo et al., 2016; Biastoch, 2017). Numerous broad assumptions such as time-varying buoyancy and prevailing weather throughout the entire voyage were made for 'back drifting' the virtual object. Unexpected anomalous surface currents and variable seasonal atmospheric changes could have certainly interrupted any assumed flow pattern substantially (see, for example, Grodsky et al., 2001; Mishra et al., 2007).

The millions of test simulation runs made by GEOMAR scientists showed that almost any location in the southern Indian Ocean could have been a candidate crash site. Some example crash sites are shown in Figure 4. The underlying question remains whether the critical pings as reported by INMARSAT were indeed correct and verifiable independently.

Figure 4 Example debris trajectories of GEOMAR computer-simulated test object analysis of ocean drift of debris



'+' denotes the location of computer-simulated submerged object as of March 8, 2014, based on back calculation of ocean drifting of test object from the Reunion landing site on about July, 2015. The assumption was that the simulated path of the test object had passed through the 7th Arc.

Source: adapted from Durgadoo et al. (2016)

The DGA Techniques Hydrodynamiques[6] in France had also conducted a separate analysis of oceanic drift of the flaperon[7] found in Réunion in July, 2015 (Anon., 2015c). It may be noted that the public release of this study report has not been made.[8] Barnacles (*Lepas* spp.) were found notably on both sides of the recovered flaperon (Daniel, 2016, p.3). If the barnacle species was the common *Lepas anatifera* Linnaeus 1758 (commonly known as pelagic gooseneck barnacle), then the debris could only have drifted on a fully submerged basis in a warm water environment. The effect of wind (Munk, 1950) would have had little or no impact on the direction and speed of travel of the object. *Lepas australis* Darwin, 1851 (also known as goose barnacle) thrives only in the colder austral marine environment between 30° S and 60° S (see, for example, Newman and Ross, 1971; Newman and Abbott, 1980; Hinojosa et al., 2006; Vanstreels et al., 2012).

To date, there has been regrettably no known identification of the particular species of *Lepas spp.* and its life history on the found flaperon. A detailed biological investigation of any barnacles, if present, attached to the found debris would certainly have provided important clues to, among other things, the 'date of the crash' in the creation of the floating MH370 debris, and the 'history of maritime travel' of the floating MH370 debris. The natural marine biology of common barnacles is well understood for the undertaking of this investigative task (see, for example, Newman and Abbott, 1980).

Wise (2015) has provided a more detailed analysis on the flotation of the found MH370 flaperon. Daniel (2016: 18) concluded that

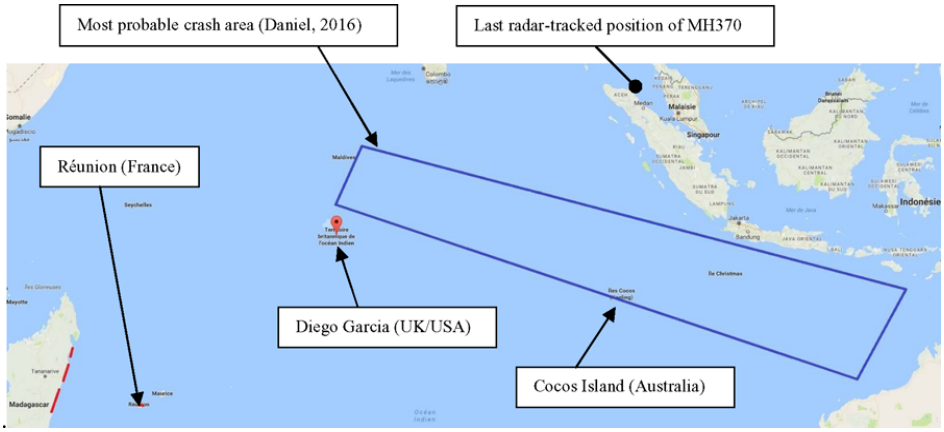
> "Les calculs de rétro dérive a partir du lieu découverte du flaperon indiqueent plusieurs
>
> localisations possibles le mars 2014 en function des hypothèses faites sur la flottabilité.
>
> Avec l`hypothèse de flottabilité determine par les travaux de DGA Techniques
>
> Hydrodynamiques (scénarios 1 à 3), les lieux où pouvaient se trouver le flaperon le 8 mars
>
> 2014 se situent sur un axe s`etendant du sud est de l`Australie (cap Leeuwin) à l`ouest de
>
> l`Océan Indien au sud 35º S. La probabilité associée est au maximum de 21%.
>
> Avec l`hypothèse de flottabilité à fleur d`eau, sans prise au vent (scénarios 4 à 6), les lieux où
>
> pouvient se trouver le flaperon le 8 mars 2014 se situent beaucoup plus au nord sur de vastes
>
> zones océaniques allant de l`est de Diego Garcia à la mer de Timor, et à l`ouest nord-ouest de
>
> l`Australie. La probabilité associée est au minimum de 70%."

According to the DGA Techniques Hydrodynamiques report, the most probable origin of the debris found in Réunion is illustrated in the marked rectangular area in Figure 5. Moreover, Daniel (2016) commented that if the MH370 had indeed crashed in the southern Indian Ocean (e.g., 1500 km west of Perth, Australia), uprising cold ocean (Western Australian) current would have caused debris to be washed onto the southern and western Australian coasts. This suggestion concurs with the pattern of the ocean current off western Australia (as shown previously in Figure 3). Interestingly, no debris

from the disappeared MH370 had been found to date on the western or southern Australian shores.

Since the discovery of the first MH370 debris on shore of Réunion on 29 July, 2015, more than 20 other debris have since been found in areas as far south as Mossel Bay (South Africa; 34.2° S, 22.1° E) and as far north as Pemba Island (Tanzania; 5.2° S, 39.8° E). The Government of Malaysia (2016) has published a summary of 22 found debris, as of August, 2016, mostly on the shores of southeastern Africa, including Madagascar and Mauritius.[9] The additional locations of found debris would certainly effect a re-analysis of ocean drift in fixing the geographic site of the crash.

Figure 5 Probable location of MH370 crash site (see online version for colours)



Adapted from original data reported by Daniel (2016: Figures 10–13); the rectangular area was posted for simpler presentation by http://quialesavoiralepouvoir.blogspot.ca/2017/05/mh370-conclusion-du-rapport-detude-de.html

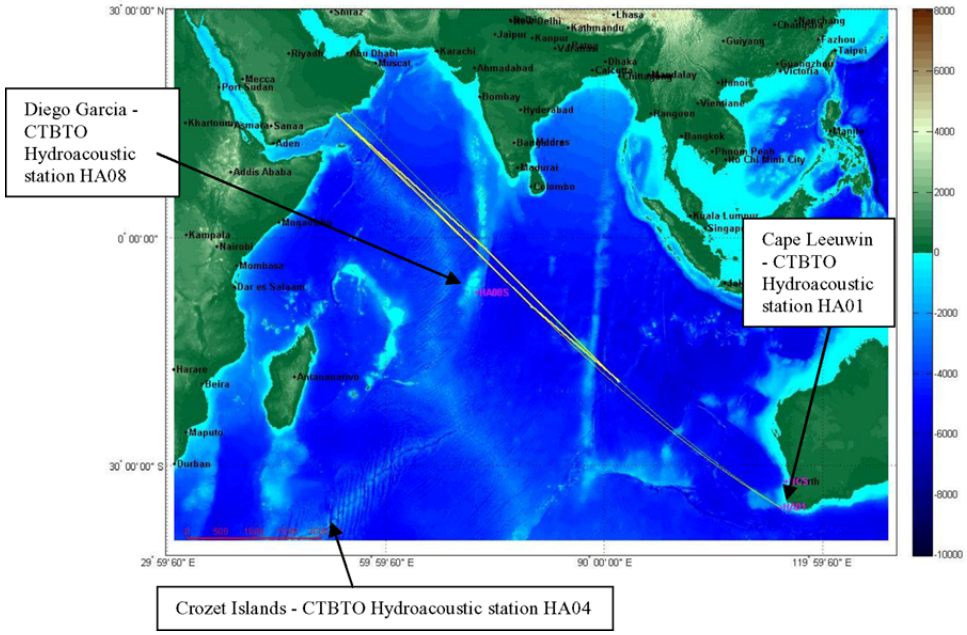
3.1.3 Other enigmatic issues

Hydroacoustics

The science of hydroacoustics is deployed by, among others, CTBTO[10] to detect unusual underwater explosions such as nuclear bomb testing and submarine seismic eruptions (Anon., 2005; Hanson and Bowman, 2005; CTBTO, 2015). Duncan and co-workers at the Centre for Marine Science and Technology at Curtin University (Perth, Australia) had analysed abnormal hydroacoustic event in the Indian Ocean near the time of the disappearance of MH370. These researchers use the official CTBTO hydroacoustic data to conclude that the unusual noise detected might have been caused by the impact of the MH370 into the Indian Ocean (Curtin University, 2014; Butler, 2014; Duncan et al., 2014a, 2014b). Figure 6 shows the most probable crash area to be near Diego Garcia. This preliminary finding was supported by a report issued by physical oceanographers at the University of Washington (Dall'Osto and Dahl, 2014). Note that the hydroacoustic-identified region was similar to that suggested by Daniel (2106) in Figure 5. Interestingly, about 2 months later, another report was issued by these Australian researchers to 'refute' the earlier finding (Duncan et al., 2014c). The latter 'revised' conclusion was that the unusual noise signal was probably emanated from some submarine volcanic

activities in the studied region. The ATSB (2014a) had somehow dismissed the initial finding of the Curtin University researchers into one-page Appendix B (Page 40) of its "MH370 – Definition of underwater search areas" report. The ATSB reasoning was that the crash location suggested by hydroacoustic analysis did not fit the 'decided' reliance on the verity and accuracy of INMARSAT pings data. In view of the failure of the present search scheme, the alternative location suggested by the unusual hydroacoustic event should be considered anew, without prejudice.

Figure 6 Probable MH370 crash area as deduced from CTBTO hydroacoustic data (see online version for colours)



The yellow lines delimit the probable area of source location.

Source: Adapted from Curtin University (2014) and Duncan et al. (2014a)

Infrasound

Infrasound technology is based on the detection of sound at wave lengths below 20 Hz. In one application, present technology permits the determination of distant location of an atmospheric explosion event[11] with considerable precision (Haak and Evers, 2002; Haak, 2003; Haak, 2006; Evers and Haak, 2010; Prior, 2014). The CTBTO operates concurrently several infrasound monitoring stations in the Indian Ocean area (Christie, 2007). The most pertinent stations are those situated in Diego Garcia (Station IS52), Cocos Island (Station IS06) and Kerguelen (Station IS23; 49.5° S, 70.1° E). It is reasonable expect that the crash of MH370 into the Indian Ocean would have been detected by these CTBTO infrasound monitoring stations. Yet curiously, there has been complete silence from CTBTO and others about the deployment of infrasound monitors

to confirm (or deny) existence of such an explosion event at any time between 1822 UTC and 0019 UTC. The exception was an inexactly dated unauthored CTBTO report describing its *unsuccessful* detection of any unusual infrasound event at 1800 UTC (CTBTO 2014). At that particular time, MH370 was still flying in the Gulf of Thailand. It may be noted also that USA, UK, Australia and others also operate infrasound detection stations for military purposes in the Indian Ocean basin. Information on the extent of these military installations is not available in the public domain.

Cocos Island

If the INMARSAT-released data were accepted to be true, then MH370 would have flown very near the vicinity of Cocos (Keeling) islands (12.1º S, 96.8 º E) on its way to the southern Indian Ocean. Despite the vehement denial of the Australian Government for many years, it would be incredibly 'negligent' if Australia had not already installed a secret electronic spying system on Cocos Islands for reasons of 'national security' (Whitlock, 2012). And yet the Australian Government has been exceptionally silent about anything that might have been tracked at its Cocos Islands land-based monitoring station. Fixed land-base air traffic surveillance radar could easily cover a range of nearly 400 km.

CSIRO[12] (under ATSB contract) has recently announced that its scientists have created new computer-modelling evidence indicating the crash site to be just north of the previously intensively-searched zone (Anon., 2017a; Hunt, 2017b). Interestingly this new information would suggest Cocos Islands to be in the direct northward ocean-drift path of MH370 debris. But why no debris has been found to date in the vicinity of Cocos Islands? The credibility of this and previous announcements about the high-probability of the exact crash site is wanting (Hunt, 2017d).

Sadly, science can be corrupted (see, for example, Lewis, 2014; Sabbagh, 2017). It is generally known that 'science can be purchased' to produce a certain conclusion. After all, scientists could not "bite the hand that does the feeding". In essence, scientific research could be ordered at will by the State to justify the crash location to be anywhere purposely, except Diego Garcia.

Over-the horizon radar

Modern land-based over-the-horizon radar[13] could have easily detected aircraft movement as much as 5000 km away (see, for example, Frissell and Hockersmith, 2008; Sinnott, 2015; Engineers Australia, 2016).

Figure 7 shows the reported official coverage of the over-the-horizon radar installation at Leverton (Western Australia). The actual range of coverage may probably be significantly greater than that disclosed publicly. The missing MH370 as a menacing 'unidentified flying object' (with wing span of ~61 m and fuselage length of ~63 m)[14] would not have escaped detection. And yet the Australian government has notably silent about this matter (Perret, 2014).

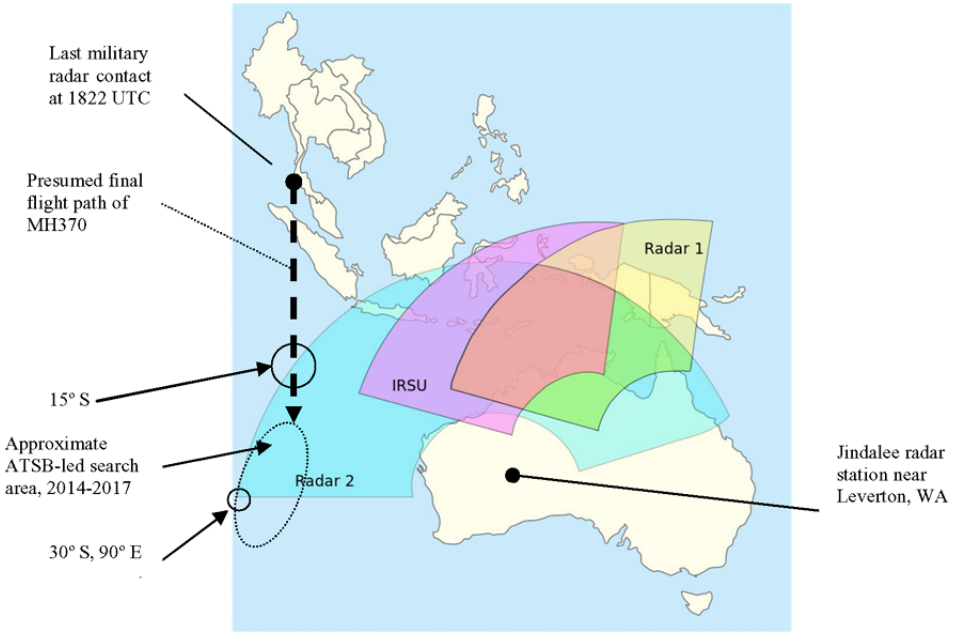
Other full-spectrum surveillance methods

There are also additional military means of surveillance of distant air traffic such as using high-resolution geo-stationary satellites and long-range aerial drones (see, for example, Lawler, 2010; Fung, 2014; Rogoway, 2014; Manaugh, 2016).

3.2 Hypothesis 2

MH370 might have crashed in an area other than the southern Indian Ocean. This hypothesis was constructed in consideration of additional pertinent elements of geopolitics and the social psychology of the pilots.

Figure 7 Official coverage of the Jindalee over-the-horizon radar network (see online version for colours)



Source: https://upload.wikimedia.org/wikipedia/commons/thumb/4/4d/JORS.svg/431px-JORS.svg.png

3.2.1 Contemporary geopolitical context

Diego Garcia is the largest island in the Chagos Archipelago administered by Britain since 1814 (Vine, 2009, p.23). In the mid 1960s, the British government concluded a secret deal to lease the island to the USA for use as a military base, for a vague period of time. As noted by Vine (2009: 88), no money was paid; only US$14 million debt owed by Britain to the USA was forgiven. As a condition of the deal, the British government undertook to evict all Chagossians from their homeland, perhaps in perpetuity, without recourse,[15] so that all future American military activities in the archipelago could be conducted unimpeded secretly. In 1971, indigenous Chagossians were summarily evicted by the British Government.

Since the 1970s, Diego Garcia has been built into a vast heavily-fortified military and sophisticated electronic surveillance base. The critical importance of this military installation is further increased by the global war on terrorism (GWOT) by USA after September, 2001. This secretive air base had probably hosted, among other things, black-site torture chambers for the GWOT (see, for example, Bose, 2012; Doward, 2014). The British government had long maintained the policy of 'benign ignorance' about activities

at the leased-out Diego Garcia property (see, for example, Anon., 2014a). Finally in 2008, the British government was forced to admit publicly that certain GWOT rendition flights had indeed stopovered in Diego Garcia (see, for example, Tran, 2008). Australia and the UK are known to be sub-ordinate collaborators of American military operations globally (see, for example, Whitlock, 2012).

Because of the vital importance of the Diego Garcia military installation to the USA, any aircraft flying in the control area would have been monitored and tracked routinely. In essence, everything that moves on Earth today is monitored actively by several competing military powers. The exact position and movement of MH370 would have undoubtedly been tracked as soon as it had taken off the Kuala Lumpur airport. And yet the USA has provided no information whatsoever to date about what it knew from its Diego Garcia air-space surveillance operation.

3.2.2 Social psychology of the pilots

Motives and opportunities are the essential elements for committing a violent act against oneself or against others. Even if Hypothesis 1 was true, there is no common-sense logic for the MH370 pilots flying silently and intentionally for several hours to the southern Indian Ocean off the coast of western Australia for a voluntary 'suicidal' crash into the sea. There is no reasonable explanation for the MH370 pilots to become suddenly deranged after flying for an hour from Kuala Lumpur towards the Vietnam coast, and then make a sharp left turn towards Palau Langkawi, and finally (supposedly) make another sharp left turn to fly the aircraft to the southern Indian Ocean. The prevailing social psychology of the MH370 pilots is not known to have been examined in detail.

Any persons intending to commit suicides along with many unwitting victims would have customarily made their views known, i.e., leaving written suicide notes, making recorded video messages, etc., in a public place (Olson, 2005; Rogers et al., 2007; Lester, 2015; Lester and Stack, 2015). There was nothing to suggest that the pilot (and/or the co-pilot) was planning to commit suicide by plunging the airliner into the sea. The final voice communication was "All right. Good Night. Malaysia Three Seven Zero", not *Allahu Akbar* (Arabic: God is great) or *Tawkalt ala Allah* (Arabic: I rely on God). If suicide was indeed planned, there is no logic for MH370 to continue flying for several more hours only to plunge into the southern Indian Ocean off Western Australia due to the lack of fuel. In the suicide proposition, the pilot and/or the co-pilot could have merely changed the air-lift control causing the aircraft to crash instantly into the Gulf of Thailand, shortly after the airliner had left the air space under Malaysian flight control. It has been reported that the flight-simulation computer owned privately by the captain of MH370 was seized by the Malaysian authority, shortly after the disappearance of MH370 (Hunt, 2016). But what Captain Zaharie Ahmad Shah was practicing? In mid 2016, Australian officials announced that the search of the Captain's computer has shown "someone had plotted a course to the southern Indian Ocean" (Hunt, 2016). But the exact content of the computer simulation exercise has yet to be disclosed publicly. What were the motive(s) if either the pilot or and/or co-pilot had intended to commit suicide? Leaving no known suicide note by either pilot or co-pilot is an oddity.

Crashing the MH370 in the vicinity of Diego Garcia might indeed be very plausible. But why would MH370 be flying in the vicinity of Diego Garcia? The underlying reason could be simple; the two pilots of MH370 were devout Muslims. They might have became increasingly frustrated by the continued demonisation and incarceration of

innocent Muslims worldwide as led by the USA in its endless GWOT. In practice, GWOT continues to be directed against Muslims in general, and 'radical' Muslims in particular. The pilots might have planned to draw global attention to the atrocities committed under aegis of GWOT by landing the aircraft on Diego Garcia. It is obvious to those skilled in the art that crashing a single large civilian aircraft such as Boeing 777 into the Diego Garcia military base would not be able to cause any permanent devastating damage to anything. Thus an intentional suicidal crash would have been an ineffective exercise.

In the realm of English-language literature, Voltairine de Cleyre first advocated this means of high-profile civil protest against societal injustice in the early 20th Century (Goldman, 1932; DeLamotte, 2004; Presley and Sartwell, 2005). Witness that the high-profile protest of concerned citizens against nuclear weapons testing in the Aleutians Islands (Alaska) in the late 1960s (Hunter, 2004). These Greenpeace protesters had no intention of self-destruction during their intrusion of the nuclear bomb testing zone in Amchitka (Alaska). In retrospect, the Greenpeace protest did contribute crucially to the beginning of the end of nuclear weapons testing by the USA government decades later. It is also recognised that there have been numerous incidences of intentional self-destruction during highly publicised protests against societal injustices (see, for example, Biggs, 2005; Patler, 2015). The planned landing of MH370 at the Diego Garcia military airport might have been such a publicity event.

MH370 might never had reached its planned destination of Diego Garcia. The aircraft could have been shot down at some distance from Diego Garcia. With the full cooperation of Australia and Britain, the search could easily have been diverted far in the southern Indian Ocean to allow time for the clandestine cleanup of shot-down aircraft debris. The time needed for total clean up would have taken many months. What was found in Réunion and Mozambique coast might probably be errant debris that have escaped the initial scavenging operation.

Moreover, if an airliner had simply crashed into the sea on purpose, floating debris such as destroyed aircraft parts and personal belongings of passengers would usually manifest without exception, within hours and days after the crash, even if the sea was very deep. Compare Air France Flight 447 crashing into the Atlantic Ocean in June, 2009 (BEA, 2012). The Brazilian Navy recovered the first major debris within 5 days of the accident. The area in which the Air France aircraft crashed had a depth of as much as 4700 m.

Curiously Diego Garcia (7.31° S; 72.41° E), an atoll of the British Indian Ocean Territory, was never mentioned in public news media as a possible destination of MH370. The only notable exception was the article written by Chuckman (2014) in the April 18, 2014 issue of the Pravda. Chuckman mentioned Diego Garcia only obliquely in connection with American satellite surveillance capabilities. Why is there such international silence? This atoll is well within the flying range of the missing MH370, shorter than the distance from Kuala Lumpur to Beijing. The non-stop flying time from Palau Langkawi to Diego Garcia would have been about 5 h. Public record shows that Diego Garcia is heavily fortified with the most advanced military armament and surveillance technologies. Any prospective intruders by sea or air would have been detected instantaneously, perhaps even at a distance of many thousands of kilometres away, by omnipresent military reconnaissance ships, aircrafts and satellites. The radar signature of the Boeing 777-200ER aircraft would have been very distinguishable. It would thus be improbable that the flight path of MH 370 could have gone undetected for

many hours after its abrupt change of flight path in the Gulf of Thailand. The possibility of MH370 having been shot down 'inadvertently' by American surface-to-air missiles had been raised by others previously (see, for example, Barrell, 2014; Cawthorne, 2014). Moreover, there are precedents of impulsive wanton killing in military operations (see, for example, Turse, 2013). One can recall months of official denial through the State-influenced EUSAC (European Union, USA, Australia and Canada) news media on the purposeful destruction of Iran Air Flight 655 in Iranian air space by an American missile in 1988 (Huynh, 2003; Ghasemi, 2004; Chomsky, 2014). Eight years later, the United States settled this tragic incident with the Islamic Republic of Iran, without issuing an apology or admitting guilt, by paying financial compensation to the families of the 290 innocent victims travelling from Banda Abbas (Iran) to Dubai (United Arab Emirates) on the ill-fated Iran Air Flight 655 (Fisher, 2013; Kaplan, 2014). In the same context, the mid-air destruction of Pan Am Flight 103 over Lockerbie (Scotland) in 1988 has the same overt political influence on the subsequent criminal investigation (see, for example, Koechler, 2003). There was considerable geo-political pressure to secure a pre-determined outcome.

In the pre-planned flight of MH370 to Diego Garcia, all electronic communications emanating from MH370 were turned off purposely by the pilot(s) after the final voice communication with Malaysian air traffic control. Even if the electronic communication system was switched on again to emit relevant identification during its final approach to the Diego Garcia runway, the renewed radio communication could have been ignored by the military command at Diego Garcia, on the belief that this secretive air base is under attacked by 'Islamic extremists', viz., civilian aircraft pilots who are Muslims. Thus, the intruding aircraft would have become a target to be destroyed in mid-air by missiles fired from the military base. This situation is similar to that of the downing of Iran Air 655 by American missiles in 1988 in which the operating principle was "shoot first, ask question later". If MH370 was allowed to land at the Diego Garcia air base, the event could become a publicity management fiasco for the resident militaries as too many secrets of the air base would have to be revealed to the 229 passengers and 12 crew members of MH370, and subsequently to investigative journalists.

It may be added that a parallel situation also exists in the politicised technical investigation of the crash of MH17 in eastern Ukraine in March, 2015. It could be accepted that Dutch government should lead the crash investigation, as most of the passengers were of Dutch nationality. But because of vested geopolitical interest of the Netherlands, there is considerable suspicion that the investigation was tilted to reach a certain pre-set conclusion (see, for example, Cartalucci, 2014; Lantier, 2014). *Cui bono?* In essence, Russia is usually blamed as the 'villain' because of the ongoing civil war in eastern Ukraine (Anon., 2017b). Inexplicably, certain electronic surveillance data including those from American military spy satellites were never requisitioned and analysed by the Dutch investigating authority. Relevant operations at the flight traffic control centre in Kiev were also never examined diligently.

The mainstream media might have been coopted by Officialdom to remain silent about the possible involvement of the Diego Garcia site. Few suggestions about the possible nefarious role of the Diego Garcia site were raised in 2014 shortly after the disappearance of MH370 (Chuckman, 2014; Spaeth, 2014). Questioning State pronouncements has continued to be extremely rare to this day.

3.2.3 Some unresolved issues

Reported sighting at Maldives

Sighting of a very large aircraft flying at low altitude near Kudahuvadhoo (2.6° S, 73.0° N; Addu Atoll, Maldives) by numerous local inhabitants in the morning of March 8, 2014 was reported (McIntyre, 2015; McNab, 2015; Shears and Calderwood, 2015). The distance between Kudahuvadhoo and Diego Garcia is approximately 1100 km. On a sight line to account for the curvature of the Earth, the height[16] over Diego Garcia (sky) would need to be about 13,000 m, in order for a person situated at sea level in Kudahuvadhoo to observe the flying object. Note that the reported Kudahuvadhoo sighting in the northern Indian Ocean is coincident the area suggested independently by Daniel (2016) and by Duncan et al. (2014a). Despite these uncertain 'eye-witness' reports, these leads should have been followed rigorously as in any forensic investigation. In connection with the above reported sighting, some debris were found in the Maldives in mid-August, 2015 (Anon., 2015d). However, just a few days later, Malaysian authority quickly declared that the debris were not from the disappeared MH370 (Anon., 2015e).

Last moment of MH370

If MH370 had crashed because it ran out of fuel at any location, a large aircraft such as Boeing 777-200ER could theoretically glide for 20–30 min (from a height of about 10 km) into a 'soft' water landing in a complete shutdown of the two jet engines. In this scenario, the cabin crew could have time to open the 8 emergency exit doors and evacuate the passengers quickly into on-board automatically-inflated life rafts. Furthermore, passengers and cabin crew might have had time to put on inflatable personal life jackets. Such highly-visible life rafts drifting in the open water could have easily been spotted visually by over-flying civilian and/or military aircrafts, and/or military surveillance satellites.

The other possibility is that MH370 had entered the water almost vertically, i.e., a smooth nose-dive as described by Finkleman (2014) and Chen et al. (2015). In such a scenario, the aircraft entering the water, at example 70 m/s, would have caused the air-sealed aircraft cabin to implode within a depth of 100 m, resulting in considerable generation of floatable as well as sinkable debris. Certainly if the aircraft was considered as a solid object, the nose-dive entry would have permitted the object to sink to the bottom of the ocean without any debris formation. In view of the limited amount debris found to date (Government of Malaysia, 2016), these last-moment scenarios remain speculative.

New analysis of satellite reconnaissance data

Interestingly, ATSB had only recently ordered a technical study of satellite reconnaissance photographs in the period shortly after the disappearance of MH370. There was no credible answer given to explain such a delayed investigation. Nevertheless, Minchin et al. (2017) suggested that the debris examined from *Pléiaides h-1A* satellite[17] photographs were likely to be non-natural and *could have been* from the disappeared MH370. The critical question is whether there are still secret higher-resolution images from military satellites of various military powers to be analysed in aid of the search of the disappeared MH370.

Possibility of geo-political cover-up

If MH370 was shot down in mid-air, there would surely be debris scattered in this region of the Indian Ocean. A coordinated effort to direct publicised search of the missing airliner in an entirely different region of the Indian Ocean would certainly be the most effective approach to allow the perpetrators sufficient time to clean up and sanitise the area where the airliner was shot down with the loss of 239 innocent lives. Could British and Australian government information be trusted? Both Britain and Australia might be parties to this deceptive pursuit as both countries are members of the Five Eyes, an exclusive secretive geo-political intelligence-sharing alliance which includes US, Canada and New Zealand. Although INMARSAT Plc is an independent company listed on the London Stock Exchange, it is certainly not immune to be coopted by bribes or by threats by EUSAC governments. There are many examples from recent geo-politics in which seemingly compelling evidence disclosed to the public was indeed manipulated or fabricated purposely to fit the desired outcome.

3.3 Path forward

The official Australia-led search for the missing MH370 was terminated in mid-January, 2017. The relatives and friends of MH370 crash victims have since frantically trying to continue the search (Phillips, 2017). But how and where? The course of action for the relatives and friends of the MH370 crash victims is limited as Officialdom is routinely adamant in withholding critical information for hackneyed reasons of national security. Denial of the existence of official record is another frequently-used excuse to deter any public demand for disclosure. Finding more aircraft debris in the southeastern coast off Africa does not lead to the identification of the probable crash site. In retrospect, the previous search strategy, i.e., location and intensity, might have been designed to deter inquisitive citizens who are interested in finding the actual cause of the crash.

In early 2016, Mrs. Jennifer Chong (of Melbourne, Australia), whose husband was a passenger of the ill-fated MH370 flight, had filed to sue the Malaysian Airlines in the Supreme Court of the Australian State of Victoria (Russell, 2016). Her principal claim was that the Malaysian Airlines was negligent in providing safe air travel. Her lawsuit might have been more purposeful if she had sued the Australian Government instead for the release of all electronic records pertaining to the disappearance of MH370 and its immediate aftermath. Record of all pertinent secret communications with foreign powers should also be requisitioned. Hopefully, the official record has not been willfully destroyed for the concealment of State misdeeds. Perhaps then the truth could be revealed for the start of an earnest search for the MH370 crash site. However, there is no assurance that the subpoena of official government records would be successful, under the prevailing regime of ‘national security’.

In early January, 2018, Ocean Infinity, an American company had apparently made a deal with the Malaysian Government to continue the search for the missing MH370 (Smith, 2018). The financial basis was to be ‘no find, no pay’. It is unclear where this American company would be searching. Nevertheless, after more than 6 weeks of search, nothing has been found (Zhou, 2018).

4 Concluding remarks

The oceanic search for the missing aircraft had continued in the southern Indian Ocean (off the coast of Western Australia) for more than 3 years, with an expenditure of more than A$200 million. Curiously, the mainstream media in Australia and elsewhere had never raised any questions about Australia's exceptional eagerness to lead and to direct the search for MH370. It appears that money is no object when there is a serious task of cover-up to be undertaken. To date, no tangible evidence of the suggested crash site has been located.

Many critical factors appeared to have been ignored or omitted in the official investigation of MH370 made to date. For example, in considering the scientific plausibility of various claims and conjectures, it is technically impossible that MH370 could have made so many acute directional changes without human intervention, in the Gulf of Thailand and flying past Penang, before it was supposed to have turned sharply near the north end of the Malacca Strait towards the southern Indian Ocean. Malfunction of electrical-mechanical equipment would not be a credible explanation. Another example is that there has been no discussion of the possible reason for the pilots flying the aircraft for nearly 6 h just to ditch the aircraft in the southern Indian Ocean. An examination of the 'reason' might provide a clue as to where MH370 might have gone. Indeed, the social psychological element of the pilots may be of considerable importance. In the absence of suicide notes, self-destruction of pilots could be ruled out as a plausible reason for the ill-fated flight. It could be deduced that the pilots might have long planned to fly the aircraft away from its originally-scheduled destination. As devote Muslims, the pilots might have a simple motive to expose the secretive malevolent military operation in Diego Garcia.

Suspicion and distrust of government-led search activities continue. There is no conspiracy theory about the disappearance of MH370. There is a conspiracy of willful silence by some parties and artful misleads by others. What is needed is to start the search *de novo* with the consideration all clues and evidence by qualified technical experts from such disinterested countries as Cuba, Democratic Peoples Republic of Korea, Bolivia and Zimbabwe.

Conflict of interest

The author declares no conflict of interest. The author is not associated with any of the parties involved in the search for the disappeared MH370.

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Notes

[1]A ping is a short burst of electronic signal sent by an emitter (e.g., INMARSAT network) to a target receiver (e.g., terminal on board MH370); the echo (reflected signal) is indicative of the existence or viability of the target. The identity of the emitter nor the target is not revealed. Moreover, the ping does reveal the exact geographic location of the target; it only provides a general region. See, for example, Cenciotti (2014), for further description of aircraft telecommunication system.

[2]ACARS = Aircraft Communications Addressing, and Reporting System. Electronic transmissions to and from the aircraft deploy very high frequency radio signals that are received and sent by a global network of land based radio stations and satellites.

[3]UTC = Universal Time Coordinated; for most practical purposes, it is identical to the commonly used Greenwich Mean Time.

[4]Straight-line flight distance calculated using the NOAA Latitude-Longitude calculator (http://www.nhc.noaa.gov/gccalc.shtml).

[5]https://www.malaysiaairlines.com/content/dam/malaysia-airlines/mas/PDF/MH370/Malaysia%20Airlines%20Flight%20MH%20370%20Passenger%20Manifest_Nationality@10Apr.pdf).

[6]*DGA Techniques hydrodynamiques* is a naval hydrodynamic and hydroacoustic testing and research centre, operating under the direction of the Direction générale de l'Armement (DGA) of the French Ministry of Defence.

[7]Flaperon is a part of the wing structure which acts both as a flap (elevation) and aerilon (roll or bank) control. The object discovered in late July, 2014 measured ~3 m x ~1 m, with a maximum thickness of <50 cm.

[8]The 'secret' DGA Techniques hydrodynamiques report may be found on the internet at http://031C074.netsolhost.com/wordpress/wp-content/uploads/2016/05/pierre-daniel-report.pdf

[9]Only 6 items were considered officially to be or likely to be from MH370, as of 15 August, 2016 (Government of Malaysia, 2017).

[10]CTBTO = Comprehensive Nuclear-Test-Ban Treaty Organization operates hydroacoustic monitoring stations in Diego Garcia, Crozet Islands (46.4° S, 52.0° E; in the very southern Indian Ocean, just north of Antarctica) and Cape Leeuwin (32.3° S, 115.0° E; southwestern Australia). Additional details are available from Anon. (2014b). www.ctbto.org

[11]The explosion caused by the entry of the Chelyabinsk meteor into the Earth's atmosphere over Russia on 15 February, 2013 was detected by numerous CTBTO infrasound monitoring stations around the World. This specific infrasound was detected as far away as 15,000 km in their Antarctica stations (CTBTO, 2013).

[12]Commonwealth Scientific and Industrial Research Organisation, a quasi-government Australian institution

[13]The over-the-horizon radar technology has been advancing substantially over the past 60 years (Sales, 1992). It is based on the propagation of high-frequency radar signals by the Earth's ionosphere to detect and track objects beyond the line-of-sight horizon. Detailed description of the contemporary over-the-horizon radar technology may be found in Fabrizio (2013).

[14]Boeing Commercial Airplanes, 2008. *777-200/300* Airplane Characteristics for Airport Planning. http://www.boeing.com/assets/pdf/commercial/airports/acaps/777_23.pdf

[15]Legal challenge for redress by the deported Chagossians is still being fought through the UK court system and the United Nations General Assembly to this day (Anon., 2007, 2015a, 2016; Doward, 2015; Bowcott, 2017a, 2017b).

[16]Horizon, km = $3.57 \times (\text{height. m})^{0.5} = 3.57 \times (13{,}000\ \text{m})^{0.5} = 407$ km.

[17]A dual purpose civil/military very high-resolution Earth-imaging satellite, operated by the Centre national d'études spatiales (CNES) under the supervision of the French Ministry of Defense and Research.