Giza Great Pyramid

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"Heretic" models of the Great Pyramid of Giza as an energy machine

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Abstract

In the first of a series of reports on the possible reverse engineering of the Great Pyramid - or other pyramids and their complexes - as power plants, we first examined the hydraulic models of the Great Pyramid that were proposed by Kunkel (suction pump) and Cadman (ram pump). We find that neither hydraulic model fits the structural data of the pyramid. Further, their proposed engineering could not have resulted in a plausible hydraulic pump. Next, we examine Dunn's model of the Great Pyramid. This is a complex hybrid hypothesis that claims the pyramid amplified some fundamental geo-acoustic signal which Dunn has persistently failed to identify. The hypothesis further claims that the Queen's Chamber housed a chemical generator of hydrogen, with the hydrogen being driven by the acoustic oscillations of the Grand Gallery (Vawter's acoustic model) to set up a maser receiver and emitter in the King's Chamber. We find that all three claims are at odds with the pertinent structural data of the pyramid; they lack operationality and the fixed-angle maser has no apparent utility. Further, the required hydrogen cannot be generated by the proposed chemical reactions, nor can it be simply driven by undefined acoustic oscillations. On the basis of Freund's research into petroelectricity, Dunn's model further claims that the Great Pyramid harvested the electrons and "holes" released from compressed granite to generate electromagnetic radiation which he abusively compares to the output of a Tesla coil, and of the unfinished Wardenclyffe Tower. Yet, his model fails to explain how its claim that the Great Pyramid generated some 25GW of power at some 100kV of potential could be technically achieved

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with the 1.97 eV photons of the "Freund effect", while providing no engineering that could harness electrons from rock for that purpose. There is, however, much that can be learned from the failure of these engine models of the Great Pyramid - beyond the fact that they brought a much needed window of fresh air into the very stale vistas (no less erroneous) of conventional archaeology and Egyptology.

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Communication

1. Situating the problems addressed by the present series of reports

The present authors are not archaeologists or Egyptologists, and the present series of reports is not an archaeological study or an architectural description of the pyramids of Giza, nor a study in Egyptology or Pyramidology. When it comes to whether the Great Pyramid of Giza (abusively named the Cheops Pyramid) was, or not, an energy machine or a power plant - all we have to offer is a speculative, science-based hypothesis, which we shall detail in the second essay of this series. We are not saying that it was a power plant, or that we believe it must have been one. We are saying that it could plausibly have been a power plant, and proposing what form it likely had.

Our study uses data mainly from the pyramids of Giza and Saqqara to propose a new hypothesis regarding their possibly hydraulic, acoustic and electric energy functions that become apparent once these are analyzed with the scientific tools of the aetherometric method and employing present-day knowledge of energy technologies. It further proposes the resulting model as a gauge to identify the unity of function behind the identity of structure posed by the existence of sophisticated megalithic pyramids dispersed all over the world. Indeed, there is nothing particularly Egyptian about any pyramid - much to the discomfiture of conventional Egyptologists. In effect, conventional Egyptology has largely overdone the tenets on which it rests - starting with the problem of dating these megaliths.

Whatever historical timetables have been proposed by over 3 centuries of Egyptology for the original construction of the pyramids of Saqqara and Giza are most likely deeply flawed. The geologist and scientific researcher R. Schoch demonstrated [1] that the weathering patterns of the Sphinx and its enclosure wall could not be attributed to wind-driven sand erosion having occurred during the Old Kingdom (ca. 5,000 years ago) and thereafter, but resulted instead from prolonged water erosion beginning at a time when "there was more precipitation in the area, and more moisture, more rain in the Giza plateau" [2]. In his estimation, the water erosion may have began as far back as 10-12,000 years ago and lasted thereafter for a few more millenia, well before the desert dryness of the Old Kingdom set in. The result was that Egyptologists the world over denounced his findings as pseudoscience. His retort was to the point: "many people have the mistaken idea that all Egyptologists are archaeologists, and that archaeologists are scientists" [3].

Neither is the case. The question of how old are the pyramids of Giza or Saqqara remains one to which there is to this day no capable answer. They are certainly much older than 5,500 years - apparently even older than some 10-12,000 years. If their builders knew of the Great Platonic Year and passed that knowledge to the hellenic Greeks, they may well be older than 60,000 years. There is some kind of Manetho-inspired [4] malignant British influence in archaeology and Egyptology - a mental colonialism systematically vehiculated by *Nature*, the Cambridge University, *Britannica* and the BBC - that constantly shrinks the age of the past and conflates distinct sets of events so as to keep up some darwinian myth of a linear evolution culminating with European Man. Yet, there is hardly any other subject as nonlinear as archaeology and history. Social formations of all types come and go, and many leave little trace of their existence.

What by now has become evident is that all the geographic parts of the planet where pyramid structures were built became occupied by hydraulic societies managed by priest-engineers (rather than by warriors or priest-warriors) who had a substantial knowledge of hydraulics, mechanics and astronomy. What is not so evident is whether these priest-engineers were the original creators of that knowledge and the builders of those pyramids, rather than the inheritors (the hermit crabs) who occupied the buildings and retained fragments of a much more ancient and profound body of knowledge - not just of hydraulics, mechanics and astronomy, but of many diverse fields of scientific endeavour ranging from geology and geodisy to acoustics, electricity, gravity, medicine, etc. The question is relevant to the problem of the origins of the State as a social organization: "underneath every Black and every Jew there is an Egyptian, a Mycenean underneath the Greeks, an Etruscan underneath the Romans. And yet, what oblivion falls upon their origin, a latency that lays hold of the State itself, and where their writing system itself disappears" [5]. Everywhere an "Asiatic formation" serves as the base social structure at the origins of monumental and written history.

The more one delves into the construction of the megalithic pyramids and explores possible and plausible explanations for their usage as energy machines or power plants, the more apparent becomes the likelihood that the original builders had a profound scientific and technical knowledge of most aspects of physics - from physical chemistry to biophysics and electroacoustics. This reverses any linear scheme of evolution: "It may be, as some indeed suspect, that the science we see at the dawn of recorded history was not

science at its dawn but represents the remnants of science of some great and as yet untraced civilization" [6].

A civilizational collapse may well bury much of the science and knowledge that kept the civilization alive, leaving behind scattered traces that survening occupiers assemble in a mix of confused memories and more primitive techniques, all glued together by magical and imaginary connections. On the other hand, it is always possible to make a religion out of science - and divide knowledge into realms, esoteric and exoteric, as so many societies of *illuminati* have practiced. Just as it is always possible to turn knowledge into a source of despotic power, or turn technology into forms of socio-political control. One can even argue that this must have been so in these proto-ancient civilizations on the basis of circumstantial evidence. For, indeed, these megalithic pyramids are most often found near river estuaries or lakes, where hydraulic societies practiced sedentarian agriculture and nearly everywhere presented a stratified Despotic State structure with a heliognostic religion that priviledged the notion of an afterlife for the rulers. Generally, despots and their dynasties were culturally perceived as demi-gods typically "sired" by the Sun and the Moon gods, and there is little doubt that the funereal and mortuary rituals of these societies played a central role in the social organization of castes and their power structure. But does this mean that these gigantic megaliths were erected for the express purpose of burying human demi-gods and insuring their "afterlife" by protecting their mummified bodies? Highly unlikely.

This much is clear: thousands of such megalithic pyramids exist all over the world, side by side with other ancient megalithic structures, including palaces, temples, obelisks, water reservoirs, quarries and astronomical observatories, not just in Egypt, but in China, southern Russia, Indonesia, Japan, Peru, Bolivia and Meso-America. Within temperate latitude limits, they are found all over the planet. Most of these megalithic pyramids, or what is left of them, have remained totally unexplored. It is equally clear that in the same regions and in still others (e.g. Mesopotamia, British Isles, Iberia, Azores, Canarias, etc) non-megalithic step-pyramids and ziggurats were also built, but using very different stone techniques. What is *far* from clear, however, is how valid is the still central tenet of Egyptology and conventional archaeology - that the purposes of the pyramidal structures were to entomb for all eternity demi-god despots - and, in particular, to bury those whose names have become rather abusively associated with being the original builders of such

constructions - as it has happened with the pyramids of Giza and Saqqara. Careful examination of actual sarcophagi, tombs and sepulchres frequently found around proto-ancient pyramid complexes all present rather more recent datings, from just a few millenia ago. With very few exceptions, the granite coffers (erroneously but generally called sarcophagi) that have been found inside major Egyptian pyramids, as well as in the Serapeum of Saqqara and other locations, have never been used as burial coffins. Even the corpse-free "sepulchre" found at the bottom of the subterranean oval gallery of the Step Pyramid of Saqqara presents a very different type of construction than the rest of the pyramid, suggesting a posterior hermit-crab-like occupation of its giant underground chamber as a tomb.

If dating the origin of the Giza pyramids may appear to be a pointless task, one may, however, glean something about its temporal scale by understanding exactly what they might have been good for: what was the fundamental use or social utility of such structures? How did a society justify the apparently enormous work involved in erecting such megaliths with so much precision in astronomical alignments, in the fitting of megaliths, in the way they were cut, etc? Can one plausibly reverse-engineer them if they were once energy machines?

Over the past 75 years, investigators from different backgrounds - scientists, engineers, archaeologists and laymen - have ventured diverse heretical ideas of how, in particular, the Great Pyramid of Giza might have operated as an energy source. This would provide an evident socio-economic rationale for its construction. Unfortunately, only rarely have these ideas been scientifically grounded - especially when they contain aspects that are rather provocative or insightful. Too many "pyramid claims" are not worth addressing. Most are so hyperbolic and facile they boggle the mind. But a few are worth the trouble - because, despite their errors, they intuited and sketched some plausible features of these ancient energy sources. Yet, even those models that are worth addressing fail to provide a coherent diagram of the proposed "pyramid machine". There is always too little (of substance) or too much (of nothing). Too many assumptions are made, and very little is gleaned.

The few hypotheses that deserve scrutiny mainly fall into two groups: the hydraulic models of the Great Pyramid as a water pump (E. Kunkel's and J. Cadman's models), and C. Dunn's model of a "seismically-driven", or "Earth pulse-driven", resonant acoustic

transducer that powered an hydrogen maser and worked as "an electron harvester". Others, at different times, have loosely suggested that the Great Pyramid functioned like an electrostatic generator. Though I. Sanderson never stated this much, he was one of the first investigators of what he called "frightfully ancient electrics" [7] - by putting together a comprehensive argument to the effect that ancient peoples, and Egyptians in particular, possessed an electric technology that included batteries, vacuum tubes and lamps, capacitors and electrostatic generators analogous to the van der Graaff machine. The original interpretation of the frequently-depicted *djed*-pillars as one such generator equipped with a stack of insulators - which was provided by one of Sanderson's collaborators, M. Freedman - remains one of the most cogent cases one can read. Yet, it is equally possible to develop the analogy as if it depicted a Tesla coil equipped with insulator baffles, or capacitances and tertiary coils. Thus, in what follows, we will also examine the possibility that the Great Pyramid might have functioned as an electric generator. In effect, this is an essential part of the model that we will propose in the second paper of this series. Lastly, in the context of models deserving scrutiny, we should mention the excellent acoustic and forensic analysis that R. Vawter - a long-standing associate of Dunn - made of the Ascending Passage, the Grand Gallery and the King's Chamber. The acoustic model he proposed can be seen as an hypothesis that is distinct from that of Dunn's, as one which stands on its own. Dunn coupled it to his own model, but there is no reason why Vawter's model - or part of it - could not just as well be coupled, specifically, to a water ram model of the Great Pyramid.

In the present series of essays, we will take some of the intuited ideas put forth by the models that are worth considering, to run with them in a rather different direction than taken by anyone else before. Of course, we are still discussing hydraulics, acoustics, electricity, etc - that is, the physics of the natural world. But we will be doing so under the light of the systematic new physics and microfunctionalist algebra that our own work of discovery has proposed and developed. After examining in our first report the most relevant models of the megalithic pyramid as a power generator, we will show in a second report how, through a concerted analysis of the hydraulics, acoustics and electrodynamics of the Giza pyramids, their technology was likely ambipolar and centered on the operation of massfree sonoelectricity and its direct connection with the manipulation of gravity. We have already laid the groundwork for that ambipolar connection, both in our Volume II of

AToS and in our study of acoustics in chapter 8 of Volume VI on thermodynamics [8]. Particularly, in the latter, we proposed a new theory of tuning sound by the electrogravitic frequency of light leptons - which is, in effect, the free-swing frequency of every electron. We also proposed a 20-tone octave distribution of sounds resonant with that elemental free-swing frequency. We will see below how this will become relevant to the present inquiry. Still, more fundamentally, we will draw on the conjunction of three critical features of ambipolar radiation - its electric massfree properties [9], its role as the sound frequency carrier in every medium [10], and its control designed to counteract gravity [11]. With reference to the latter feature, we showed - in chapter 8 of our Volume VII on the solar system - how every planet rides a defined kinetic energy in near-equilibrium between two apposed energy fluxes - the gravitational work of the entire system and the *counter-acting* ambipolar radiation emitted from the Sun - i.e. from the "cold" and "dark" fusion reaction ongoing in its core [12].

In the context of *the new physics we have discovered*, sophisticated megalithic constructs, including pyramids, seem to have been left behind - in the wake of some series of planetarian cataclysms - to remind us that there was once a civilization which already knew of this new physics, i.e. *ambipolar massfree* physics. Post-modern humans may continue to see those megaliths as signs of slavery or slave-labor in a despotic society - yet they, and how they were built, seem to point entirely elsewhere, neither toward slavery nor toward despotism, but towards a degree of technological sophistication well beyond the present capabilities of human society. We will end up suggesting that the original pyramid builders had a technology with which they could carve (in straight or round surfaces), lift and displace with high precision, multi-ton blocks of stone using acoustic power ambipolons formed into beams at high density and potential. Sometime in a rather far away past there was some form of aetherometric science - and a whole ambipolon-based sonoelectric technology. In the last essay of this series, we will examine some of the intriguing mathematical relations between fundamental physical and geometric constants as they relate to the building of megalithic structures, pyramids in particular.

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2. The water pump hypotheses of Kunkel and Cadman

2.1. General context

The notion that the pyramids of Giza may have an hydraulic function is a logical one in socio-economic, historical and engineering contexts. The location of the Giza plateau (and likewise of close-by Saqqara) at the apex of the fertile delta of the Nile is rather indicative of the hydraulic purpose of these pyramids. In *Our Inheritance in the Great Pyramid*, Piazzi Smyth topographically localized the Great Pyramid at the exact apex of the delta (see **Plate 1**) without having even traced the branch of the Nile which has recently been proven with radar to have flown right by the end of the three causeways of the Giza pyramids [13].

The Great Pyramid is usually referred to as the Pyramid of Cheops (*Egyp*. Khufu), since Egyptology believes it was built by this King of the IVth Dynasty. It consists of some 2.3 to 2.5 million stone blocks with the mean weight of 2.5 tons, and the largest up to 80 tons.

The hydraulic function of the Great Pyramid comes down to its possible use as a water pump. Either of the pump hypotheses - Kunkel's [14] or Cadman's [15] - requires that the Great Pyramid, if not the entire Giza plateau, would have been surrounded by a water reservoir that served as the pump *sourc*e. One might object to either hypothesis on the basis that if the pyramids were surrounded by a higher-elevation water reservoir, this would have left biological and chemical traces on the outer faces of the pyramids near their bases, as well as on the floor of the plateau. But the actual outer faces of the pyramids are long gone, and the sand and wind erosion of any exposed surfaces would have, for the most part, removed any such traces.

It is possible to argue that the Giza plateau served as a source-reservoir of water - brackish or pluvial - that naturally flowed to it. A geomorphological study and simulation of the "original hill" at the base of the Giza pyramids [16] - though biased by the conventional archaeological timeline - nonetheless suggested that the "original hill" descended from the west towards the pyramids from as high as 20 m above the plateau. A water body at that height could conceivably serve to directly replenish the above-ground *source reservoir* surrounding the Great Pyramid in either the Kunkel or Cadman hypotheses, even if such a reservoir would require rather tall walls and a high volume of water - both unlikely propositions. Curiously, both hypotheses also failed to identify where

the highest-elevation *collector reservoir* would have resided. Hydraulically, it would make little sense for the source reservoir to collect water flowing from the original western hill only to pump it back up to it. However, if the water pump function was used for energy conversion (as in hydroelectric dams), the circularity of the flux would not be an objection.

The context for the water pump rationale is also geologically and archeologically plausible within specific time frames of the past. In early Late Pleistocene, ca. 130,000 to 120,000 years ago (Barbados III period), when sea level was higher by some 15 to 20 m than at present, the Mediterranean sea occupied a much greater southern area [17]. This is a definite candidate time frame, one that G. Deleuze suggested to these authors in a personal communication regarding the origins of the proto-State (Urstaat). There are, of course, other candidate time frames that could sustain the water pump rationale for the Great Pyramid, all of them being more recent. C. Hapgood has suggested that the end of the Ice Age in North America and Europe occurred ca. 17,000 years ago [18]. This was followed - sometime around 12,000 to 10,000 years ago (Dryas periods at the end of the Late Pleistocene) - by a very rainy and cold period referred to as a "Pluvial" that lasted until ca. 6,000 years ago (according to the geologist E.S. Deevey in [19]), when it was succeeded by a warmer and drier period, during which the Sahara Desert was rather fertile and presented many rivers and lakes [20]. Note how the notion of this Pluvial entirely fits with Schoch's contentions regarding the dating of the Sphinx, as mentioned already. During the Pluvial and as early as 14,000 years ago, the Sahara was occupied by various peoples who practiced hunting and fishing, and left behind thousands of rock paintings and engravings of chariots [20-21]. Irrespective of the Sphinx's age - and assuming that the age of the Giza and Saqqara pyramids does *not* date to the early Late Pleistocene (when, in our view, the best rationale for the water pump hypothesis may be found) - one can contemplate a threefold set of other alternatives to more posteriorly date those pyramids: (1) if they were built between 20,000 and 12,000 years ago (during the most intense cold at the end of the Würms Ice Age, and thus at the end of the Late Pleistocene), when sea level was near its lowest at -120 m from the present, they would have belonged to a drier and much colder epoch than the Pluvial; (2) if they were built before that, say, between 60,000 and 30,000 years ago (still within the Würms Ice Age) when the sea level was higher at ca. -40 m, they would have belonged to a warmer and wetter epoch; and (3) if they were built in the mid-Holocene, sometime around 6,000 to 5,000 years ago (as

official archaeology claims - for ex. ca. 4,650 years ago for the step pyramid "of King Zoser" at Saqqara) when sea level was where it is today, then they also belong to a still warmer and wetter epoch.

It follows that the best time-frame candidates for dating the Giza and Saqqara pyramids by the rationale of any water pump model, would be - in decreasing order of likelihood:

1. Early Late Pleistocene;
2. 6 to 5 thousand years ago (mid-Holocene);
3. 60 to 30 thousand years ago; and
4. 20 to 12 thousand years ago.

Egyptologists will immediately discard the first hypothesis (but not us) and pick the second one. But in either case, including even the third hypothesis, there is reason to support a water pump model for at least the Great Pyramid. In the first two hypotheses, the tides of the Mediterranean sea would seasonally combine with the yearly floods of the delta by the river Nile, and a water pump system that could sequester the excess brackish water would be necessary to permit some degree of flood control, water purification and managed irrigation of the surrounding agricultural fields. Likewise, water retention reservoirs would make sense to counteract the cyclic periods of drought. The Nile itself results from the conjunction of two rivers - the White Nile flowing from the African lakes in the south and bringing "with it decaying vegetable matter", and the Blue Nile from the tall Abyssinian plateau that "carries soil rich in potash" [22]. For the control of flood and drought, there was also the need to purify the water and manage its salt concentration. The plausability of this context - in which the hydraulic function of some pyramids at least would consist of pumping up water *from* the Nile - may permit, as we have just seen, some limiting dating for the construction of the Giza pyramids - wide as the time frame between the first two hypotheses of choice may be. However, this scenario is not compatible *ab initio* with either Kunkel's or Cadman's hypotheses, since it would require that their proposed *source* reservoir functioned, instead, as the higher-altitude *collector* reservoir.

2.2. Kunkel's "Pharaoh's Pump"

In a 1962 self-published book [14], E. Kunkel first suggested the idea that the Cheops pyramid was formed as a water pump system where the Queen's and King's Chambers, plus the Subterranean Chamber, all worked as water and air compression chambers. Though later re-edited in 1973 with modifications and additions, Kunkel's books have disappeared from circulation without leaving behind even an internet archived copy! One is largely left with having to rely on S. Myers' "Pharaoh's Pump Analyzed" (2023), since he claims to have access to Kunkel's original publications. However, one must be cautious in doing so, since Myers often mixes up his own erroneous and nonsensical views with Kunkel's ideas.

Kunkel assumed that water from the ancient wide area of the presently largely dried-up and salty Lake Moeris (Lake Birket-Qarun) in the Lybian Desert, located SSW of Giza and 80 km distant, fed the source reservoir surrounding the Great Pyramid. We note that, at some point, this would have involved the "original hill" described already. In Kunkel's hypothesis, the entire interior system of conduits and chambers (the Subterranean Chamber, the Queen's Chamber, the Grand Gallery and the King's Chamber) would have to be filled by water, with air being trapped and compressed in the upper part of all chambers. The descending passage that leads from the original hidden opening on the northern wall to the Subterranean Chamber would function as the water inlet (see **Figure 1**). On the lower part of the south wall of this chamber there is a dead end tunnel that runs southward for some 53 to 57 feet (as reported by different sources at various times). Kunkel theorized that at its end there would be a valve connected to a drain - though neither a valve nor a drain, or markings coadunate with it, has ever been found there. In fact, the tunnel seems to terminate in the natural bedrock, having been carved out of it (see, for ex. [23]. Upon closure of the drain valve, water would flood the Subterranean Chamber and compress its high volume of air, with the water column rising up through the so-called "well shaft" when a second valve - placed where the "Grotto" lies - would be open. The water would flood the Queen's Chamber and its corridor, and rise up along the Grand Gallery.

Without some ram pump action located above the height of the Grotto, one would be hard put to see how water could rise as high as the Queen's Chamber, let alone the Grand Gallery. No aspiration or suction pump (akin to Savery's pump) could have done

the job (see below). In the absence of such a ram pump, a passive rise of the water would require the source reservoir surrounding the Great Pyramid to be at least as high as one-half to two-thirds of the length of the Grand Gallery. This is a tall order of height, at some 45 m or 148 feet above the plateau - a rather unlikely supposition .

Furthermore, Kunkel's model requires that a source of intense heat - located at the top of the Grand Gallery just before the triple portcullis - heated the trapped air to pressurize the water present in the gallery's lower part when the Grotto valve would be closed. The action required the portcullis to be closed. Charring of the walls and the ceiling of the Grand Gallery near the portcullis was interpreted as evidence for the presence and location of the heat source. With all communication between the Subterranean Chamber and the Queen's Chamber blocked, the heat-pressurized water would compress the air in the latter and flow past it to rise further in height until it would fill the King's Chamber, from which it would be delivered via the two internal shafts abutting on its outer walls to end up on opposite faces of the pyramid. Notice that, in order to fill the King's Chamber, the hypothesis requires the existence of a vertical communication (shown in blue in **Figure 1**) between the Queen's Chamber and the King's Chamber that has never been found. Once enough water had been expelled from the pyramid and the compressed air in the Grand Gallery and the King's and Queen's Chambers had expanded suficiently, a third valve separating those two chambers from the Grand Gallery would close, while the Grotto valve would now be opened to receive water from the reservoir inlet and again fill the Grand Gallery.

One might circumvent the above-suggested necessity of a tall-walled source reservoir by venturing, like Myers does, that once the heat-pressurized and heated water flowed out of the Great Gallery and the trapped air expanded, a vacuum was created that sucked up the incoming cold water (when the second valve was closed and the Grotto valve opened). But it is unlikely that such a substantial vacuum could be generated by the expansion of heated air since no steam was anywhere directed to a lower condensation chamber. Moreover, lift suction is limited by atmospheric pressure to raising a water column to a maximum height of 10.3 m. Putting the entrance to the descending passage at ca. 20 m above the pyramid platform means that the maximum height to which an internal lift suction could raise water would be ca. 30.3 m, well below the required >45 m.

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Seemingly, the Kunkel hypothesis did not address the existence of the pit in the Subterranean Chamber. This could more likely correspond to a possible drain function than the dead end tunnel can. Kunkel would also have to assume that the chamber's pit leads nowhere (its present state of excavation and clearing of debris has only reached a depth of some 41 feet).

It is also unclear to us whether Kunkel's original hypothesis called for yet another valve, a fourth valve (an inlet valve that Myers wrongly calls a "check valve") placed near or at the entrance of the descending passage. In the context of Kunkel's scheme it would not appear to be required at all. However, there is evidence suggestive of the existence of a pivot-swinging stone door at the entrance to the descending passage.

It is disputable what the real merits of Kunkel's hypothesis are besides drawing attention to the likelihood that the Great Pyramid might have been an hydraulic pump. Without access to any of his engineering calculations, if he made them, it is not possible to evaluate any of its proposed details. It is shameful that original work can be so effectively "disappeared", irrespective of its definitive value. There are a few positive traits of Kunkel's model that one can point to. It could explain why the so-called Grotto conduit(s) or "well shaft" between the Subterranean Chamber and the horizontal corridor that leads to the Queen's Chamber were an original feature - even though their irregularity in structure and path suggests otherwise. It may also explain why the ascending passage that leads to the Grand Gallery was blocked from communication with the descending passage by three granite plugs (see **Figure 1**. Likewise, it seemingly addresses the soot deposits at the top of the Grand Gallery. But these positive features are hardly enough to validate it, even remotely.

In counterpart, there are only too many objections to Kunkel's hypothesis:

1) To begin with, it supposes a source of intense heat located either behind the portecullis, or inside of its system, and yet, other than the already mentioned charring of the upper walls and ceiling, no traces of a source of heat can be found there. The supposition entirely and gratuitously begs the question of what is the energy source for the supposed heat - and at that, one that would be of a very significant power: what was it - some kind of combustion? Where in the pyramid was it located? How was any "fuel" introduced and controlled? The heat source itself would have to be intensity controlled

(alternatively heated and cooled) in synchrony with the cycle of the water intake and pressurized discharge, but no evidence for such control or its technology exists.

2) It requires that most of the Grand Gallery be exposed to water, but there are no vestiges of water penetration or erosion marks on its walls - and the same can be said about the King's and Queen's Chambers.

3) It supposes a necessary connection between the King's and Queen's Chambers, where none has been found. This is a critical defect, since without that connection the whole model collapses.

4) It requires that water be expelled from the pyramid via both King's Chamber shafts. But neither of these shafts presents water erosion marks. Furthermore, the northern shaft with its initial ascending bend over 70° would be grossly inefficient as a water conduit.

5) One can hardly see the point of moving water out through the King's shafts if that water ended up running down the two pyramid faces back to the source reservoir! Yet, there is no evidence of any external piping connecting to the outlets of these shafts. Of course, one could suppose a merry-go-round that just drove a pump, as if the intended purpose was to create a continuous fountain devoid of any social utility.

6) It requires that the Grotto conduit must play a critical role, whereas this conduit is the only *irregular* shaft found inside the pyramid that is not directly ascribed to an actual intrusion. Yet, it is rather doubtful that the Grotto and its upper and lower conduits were part of the original design (more on this below).

Finally, we come to a negative feature that is common to all hydraulic models - ours included: the absence of any identifiable valves and their postulated locations. But whereas our hypothesis - as the reader shall realize - readily explains why that would be so, neither Kunkel's or Cadman's hypotheses do. Thus, depending on the suggested model of the water pump, this objection may or may not be critical. Necessarily, there cannot be any scientifically definitive models of the Great Pyramid as an energy machine. The best models, whether hydraulic or other, will have to venture the existence of undiscovered features beyond the known internal structure of the pyramid.

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2.3. Basic principles of the ram pump

In modern times, the water ram pump or "hydram" was first invented by John Whitehurst in 1772 and later developed by Joseph Montgolfier in 1796 into an automatic version [24]. It is a gravity-driven water-hammer mechanism that can pump water against gravity and employs three distinct water reservoirs placed at different heights. It uses water to fight gravity with gravity, if you will. The *source* reservoir must be placed at a height intermediate the other two - the highest-elevation *collector* reservoir and the lowest elevation *wastewater* reservoir (see the schematic of **Figure 2**). Most importantly, the ram pump requires no external power. It is truly a natural, non-polluting free source of work and energy.

The kinetic energy of the water flux mostly depends on the height and length of the drop between the source and the waste reservoirs. The relationship of the cross-section of the input pipe to the drop height and length parameters is another critical dependence. The tensile strength and elasticity of the piping materials is one more limitation, since the sonic hammering causes periodic vibrations that will be dissipated by elastic materials.

The operation of an hydraulic ram can be succinctly described as follows (refer to **Figure 2**): water first flows from the source to the waste reservoirs through the *drive pipe* while the *waste valve* is open. When the flux reaches a given velocity, it pushes up *the hammer of the waste valve* with a high-pressure spike (creating the hammer wave or shock wave) and shuts off the flux to the waste reservoir. The considerable weight and momentum of the water now forces open a second valve (the *check valve*), allowing the water to enter the *compression chamber* and the pressure spike to travel through it. When the air in the compression chamber is maximally compressed, the check valve closes and the waste valve re-opens to restart the cycle. As the air in the chamber decompresses back to atmospheric pressure, the water is pushed upward through the *delivery pipe* to the collector reservoir.

Typical cycle rates vary between 1 and 1.6 pps - which is the frequency of the hammer's high-pressure spikes (HPS) - but can be as high as 8 pps. For each particular ram design there is a limited range to the beating frequency of the hammer valve. The greatest amount of water that can be pumped occurs at the maximum frequency of each pump [25]. The HPS are assumed to travel at the speed of sound in water, which is much greater

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than that in air for the same temperatures [8, 26]. We shall return in detail to the HPS topic in the second report of this series.

As we said, the ram pump power and water flow rates depend on the size of the drive pipe - its inner diameter (ID) or cross-sectional area, length and height. Technical reports on ram pumps often neglect the limitations imposed by the ID or cross-sectional area of the drive pipe. Constant slopes are best for drive pipes in order to minimize loss of flow rate and momentum, as well as decrease turbulence. Optimal slopes seemingly lie at 20% - a meter drop per five meters of length [24]. This translates into a 11.5° slope. Though costly, hydraulic rams can be homemade with simple and cheap designs.

It is worth noting that ram pumps can be designed to incorporate moving turbines that generate literally free electric power - even though no none seems to have thought about exploiting this. The turbines can be placed at different locations after the check valve, and they will undergo periodic acceleration and deceleration of their rotors. Of course, placing such turbines inside a ram system will increase turbulence and decrease the power of the ejected (delivery) water. Pertinently, we found a way to practically eliminate this problem by eliminating the turbulence. In our laboratory, we have designed and sucessfully tested a *laminar-flow* turbine *with no moving parts* that can directly extract significant power from direct currents, as may be obtained with either any continuous flow in ram drive pipes or the compressed pulsed flow in ram delivery pipes. The combination of the two technologies (hydraulic ram pump and electric laminar turbine) is an obvious opportunity to develop free electricity that our epoch has ignored. Accordingly, we have kept this proprietary information confidential.

2.4. Cadman's Ram Pump model

Without being systematic in his deconstruction of the Kunkel hypothesis, J. Cadman [15] suggested a different hydraulic scenario where the water pump of the Great Pyramid would be a ram pump - which he redesigned and named "pulse generator". Cadman understood that the fundamental Achilles' heel of the Kunkel hypothesis is the absence of any evidence for the power source required by his hot suction-pump mechanism. Cadman realized the obvious - that, with a gravity-driven ram pump, there was no need either for an external power source or for the hypothetical role of heat. That was a fundamental insight into the possible nature of the Great Pyramid's machinery.

In Cadman's scenario (see **Figure 3**), the water intake was accomplished in a manner identical to that of Kunkel's - by the descending passage connecting a surrounding water reservoir (source) to the Subterranean Chamber. The Grotto with only its lower conduit (what he designated as the stand pipe) plus the Subterranean Chamber would together form the pressure chamber, with the waste valve operating on the pit of the Subterranean Chamber and the check valve located somewhere further along the 53-57 feet horizontal shaft that exits that chamber. Air compression would occur both in the Grotto and the upper portion of the Subterranean Chamber whenever the pit valve would close, leading to the opening of the check valve and exit of the flux via some unknown delivery pipe. The waste reservoir would have the pit as its drain conduit to the Nile. Cadman pointed out to Dunn in a 2022 email [27] that "the wastegate line should exit east of the Sphinx temple's midpoint (...) 30 feet below the surface". Without knowing what exactly Cadman meant by surface, if the latter referred to the pyramid's platform, the height of the drop appears to be woefully insufficient.

Notice in **Figure 3** that for a good reason Cadman placed no valve along the descending passage that would stop the water intake from the source reservoir. This would create a vacuum on the upper part of the descending passage and completely abrogate the ram action. However, once the stand pipe would be pressurized with the waste valve open at the pit of the Subterranean Chamber, there would be no reason for its trapped air to expand and eventually return to atmospheric pressure once the waste valve would close. All that his ram design could then do would be to divert the flux through the Subterranean Chamber past the check valve.

The fundamental difference of the Cadman design to the usual ram pump is that he placed the stand pipe or actual compression chamber *before* the check or delivery valve - whereas typically the compression chamber is placed *after* the check valve (see **Figure 2**). Cadman apparently took the trouble to build small models of ram pumps per his design, and operate them from a shallow river intake by encasing the compression chamber in concrete and rock. Eventually he appears to have succeeded in demonstrating his design principle. Pulsing at 1 pps, he could feel the sonic action of the ram on the ground as far as 100 feet away from the pump. As described in [28], Dunn witnessed this demonstration in 2005. However, Dunn objected to the applicability of Cadman's model to the Great Pyramid. Correctly, Dunn pointed out that the dead-end tunnel ends in the bedrock. But,

seemingly, Dunn confused what would be the function of this tunnel in Cadman's model, conflating it with Kunkel's: as shown in **Figure 3**, it would lead to the check valve in Cadman's model, not to the waste or hammer valve. Instead, Cadman's hammer valve lies in principle below the pit - and Dunn later comes to the same conclusion: "the only other place where a connection might exist is the deep well shaft in the chamber floor" [23]. Yet, for Dunn, the absence of an obvious waste valve is sufficient to conclude that: "I'm disappointed that Cadman's model has not held up under the scrutiny of existing evidence" [29], as if there several pieces of "incriminating" evidence. Whereas, in reality, the only solid objection that Dunn could address to Cadman's model is that the dead-end tunnel indeed appears to have no continuation. We write "appears" because, to be fair, no actual survey of this tunnel has actually been carried out to this day.

When compared to Kunkel's model, the Cadman hypothesis presents a series of positive features, that we can enumerate as follows:

1) It does not require an external source of power.

2) There is no need to submerge any of the upper chambers of the pyramid, as is the case with the Kunkel pump scenario. This also explains why the ascending passage would have been blocked from the descending passage.

3) It explains how the lower Grotto conduit (or well shaft) and the Grotto itself *might* have been original construction features.

4) It explains the concave mounds present on the celing of the Subterranean Chamber. Cadman argued that they are evidence for compressed gas bubbles likely resulting from cavitation generated by the hydraulic compression pulses.

5) It explains *in principle* why a 6-foot wide pit exists at the bottom of the Subterranean Chamber.

6) It may explain why the Subterranean Chamber presents fin-like E-W parallel walls to control water vortex formation.

Before we proceed to a technical analysis and any examination therein of other objections to the Cadman model, we will summarize the evident objections that can already be made to it:

1) The tunnel carved in the natural bedrock wall and forming the 53-57 ft shaft horizontally exiting the Subterranean Chamber, is a dead end that terminates in the bedrock. This remains, indeed, a critical objection.

2) There is no confirmation that the pit of the Subterranean Chamber leads anywhere, let alone to an unidentified waste reservoir - though it is conceivable that it could and should, and that such an underground reservoir might have existed, including a drain connection to the Nile. Note that the pit has been filled with tons of debris from a variety of intrusions, apparently including al-Mamoun's.

3) Obviously, objections 1 and 2 further apply to all the other mentioned pyramids - of the Giza plateau, of Saqqara and Snefru. None of their subterranean chambers present check valve or waste valve conduits. Only for the Dashur pyramid has an horizontal conduit past the corbelled subterranean chamber been theorized to exist by archeologists.

4) The Cadman model requires the existence of a source reservoir surrounding the Pyramid, with a water height *greater* than the face opening of the descending passage. It inherits this problem from the Kunkel model, though with a less extreme height requirement (20 m vs. >41 m).

2.5. Technical analysis of Cadman's model of the Great Pyramid

The descending passage corresponds to the drive pipe in Cadman's model and has a length of 345 ft or 105.156 m, at a non-optimal inclination of 26.5°. This means its vertical drop has a height of h_{dp} = 46.9 m or 153.9 ft. Note how this differs from the lesser height from the opening of the descending passage to the pyramid's platform, which is 20.25 m or 67.5 ft.

The quasi-square opening and channel of the descending passage has the dimensions of 3ft 5in * 3ft 11.5in, or 1.0414 m*1.2065 m, with a cross-section area of A_{dp} = 1.256 m^2 and a diagonal distance of 1.585 m. Accordingly, the volume of the descending passage is

$V_{dp} = L_{dp} * A_{dp} = 132.123\ m^3$

This is the volume of water present at any time in the drive pipe. A mole of water at 1 atm and 20°C has a volume of $1.815728*10^{-5}$ m^3, so that the water volume of the descending passage contains $7.27659*10^6$ moles. We chose 20°C because this is conventionally taken as being the mean temperature inside the Great Pyramid all year round (before HVAC systems were installed in it).

Employing the lawful aetherometric value of g [30] experimentally discovered by W. Reich [31], the *peak velocity* of water falling (near the Earth's surface) over a drop equal to h_{dp} is

$$v_{H2O} = \sqrt{(g\, h_{dp})} = 21.519 \text{ m sec}^{-1}$$

or 77.47 km/h. The moment of the water flux - often called "rate of drive flow" - can then be calculated as

$$M_{dp} = A_{dp} * v_{H2O} = 27.038 \text{ m}^3 \text{ sec}^{-1}$$

or 27,000 liters per second. Since we know the volume of the drive pipe and the rate of drive flow, we can calculate the optimal (sometimes called "natural") frequency of the hammer pulses resulting from the fall of the water as it slides down along the drive pipe:

$$F_{Ram} = M_{dp}/V_{dp} = 0.2047 \text{ sec}^{-1}$$

- or one hammer pulse every 4.89 seconds. The kinetic energy of a single water molecule at the end of this drive pipe is

$$E_{H2O} = m_{H2O}\, v_{H2O}^2 = \int = \lambda_{H2O}\, v_{H2O}^2 =$$
$$= 0.181245985 \text{ m } (21.519 \text{ m sec}^{-1})^2 = 83.9324 \text{ m}^3 \text{ sec}^{-2}$$

Per mole, this corresponds to

$$N_A\, E_{H2O} = 5.0545*10^{25} \text{ m}^3 \text{ sec}^{-2} \text{ mol}^{-1} = \int = 8.393 \text{ J mol}^{-1}$$

so that a flux of $7.27659*10^6$ moles every 4.89 seconds yields a ram power of:

$$P_{Ram} = [(7.27659*10^6 \text{ moles})/4.89 \text{ sec}]\ (8.393 \text{ J mol}^{-1}) =$$
$$= 1.2489*10^7 \text{ J sec}^{-1} = 12.5 \text{ MW}$$

This is what in the Cadman model is spent by the ram to pump water from the source reservoir surrounding the pyramid, to some collector reservoir at an undefined height and location. The delivery flow rate M_{out} will be less than M_{dp} and depend on (1) the efficiency of the ram (some experimental values place it at 60%, but this depends on the details of design) and (2) the elevation h_{out} from the ram to the water outlet, as per

$$M_{out} = 0.6\, M_{dp}\, h_{dp}/h_{out}$$

Since Cadman does not know what h_{out} would be in his model, we cannot calculate the likely delivery flow rate.

Though the sloping angle of 26.5° of the descending passage is far from the ideal angle of 11.5° for the drive pipe of a ram pump, if we assume that its efficiency would be optimal, those 12.5 MW of power would correspond to an efficiency of 12.5% relative to the total power of the water flow through the drive pipe. That means that 1 liter of water

would be pumped up the delivery circuit for every 8 liters that flowed through the hammer to the waste reservoir.

What this technical analysis suggests is that there is a more substantial set of objections that can be made to the Cadman model than those already enunciated. By placing the source reservoir around the Great Pyramid, Cadman ended up with a drive pipe that has an inclination steeper by more than twice the optimal. By taking the descending passage as the drive pipe, he arbitrarily limited the possible power of the ram pump. The terminal problem posed by the dead end tunnel flows from these two assumptions. The result is that Cadman ends up with a very weak power plant - a pale outcome when compared to all the massive work that went into building a monumental megalithic construction of the size of the Great Pyramid.

3. The acoustically-driven maser power plant hypothesis of C. Dunn

For over 25 years, C. Dunn has put forth a kind of an evolving patchwork hypothesis regarding the Great Pyramid of Giza, that was much promoted by D. Kenyon's *Atlantis Rising* magazine. An engineer and machinist by profession, Dunn has claimed his hypothesis to be scientific. Yet, it also contains plenty of erroneous assumptions, side by side with rather pertinent observations and intuitions. His latest book (2024) is perhaps the worst rehash of his hypothesis - titled "*Giza - the Tesla connection*". In these days of green and clean, all things are Tesla. Pity that Tesla *never once mentioned any pyramid whatsoever* in all his writings, patents and lectures. The irony can be extreme: in a video by "*Universe Inside You*" productions, a set of wires descending from the secondary in a Tesla patent were named "Tesla's electromagnetic pyramid" as if the caption had been present in the original patent... It is not just the pyramid bit that is ironic, but the adjective "electromagnetic", since Tesla claimed to have discovered that the "aether electricity" was *not electromagnetic*, but could be converted into electromagnetic energy. Nothing escapes disinformation by advertising fads.

So what is the would-be Tesla-like basis for Dunn's hypothesis of the Great Pyramid being a power plant and "electron harvester"?

To provide a fair answer, we must first understand what the Dunn hypothesis puts together, and how. But before we do so, let us remind the reader that Tesla considered his invention (made at Colorado Springs) of what he called "the magnifying transformer" as

his greatest. With it, he purported to have been able to engineer standing electric waves on the Earth that were resonant with the Earth's own "electrical vibrations". The claim - as he made it in his *Colorado Notes* - is clearly distinct from his other inventions regarding resonant transmission and reception of power through the ground. Specifically, it refers to a system of *energy capture* - where one or more natural oscillations present in the ground would be selectively magnified by a positive feedback system so that electric power could be directly extracted from the Earth's electric field by a capacitative-inductive coupling. In essence, Dunn claims that the Great Pyramid did just this - amplified the natural oscillations of the Earth. Yet, since he really does not know how Tesla did it, or how it can be done, he instead stitches together a series of different energy converters that he couples one after the other: an acoustic Earth resonator, a chemical hydrogen generator, an hydrogen maser receiver and emitter, plus a petroelectricity collector. With this series of couplings, he claims that the Great Pyramid could capture the constant vibratory activity of the Earth to release electrons. Let us see how he articulates the steps of his model.

Dunn's hypothesis begins with a notion somewhat borrowed from Cadman - that the Subterranean Chamber is a kind of acoustic pulse generator. But whereas Cadman's hypothesis was at least grounded in some amount of hydromechanical engineering (the acoustic pulse was the result of the hydraulic ram pulse), Dunn makes the unverified claim that this chamber vibrates with the seismic frequencies of the Earth: "(...) the Earth's vibrations could be a source of energy that we could tap into" [32]. His notion encompasses not just ongoing low-frequency seismic oscillations that he largely attributes to tidal action, but also contributions from earthquake activity - going as far as employing the concept of an "Earth's pulse" as if he was defining a modal oscillation (which, for his purpose, would have to be substantial in power). Without explaining how, he states that "once the pyramid was vibrating in tune with the Earth's pulse it became a coupled oscillator" [33]. Just what is the frequency of this pulse he does not provide. Perhaps it is the Schumann frequency near 8 cps, perhaps not. We shall address this in a separate communication regarding this frequency. In a rather poor paper written by E. Wilson as Appendix C to Dunn's 2024 book, the frequency is stated as ranging from 3 to 6 "Hz" (or rather, cps) with "the thermoacoustic machine" requiring "a hammer-force shock to start the reaction" [34]. However, there is no mention in this context of an hydraulic ram action.

Note in passing that we write cps for *cycles per second* - that can just as well be counts per second - and not "Hz" for Hertz, because Hz is by definition a frequency measure of the oscillation *of an electromagnetic field*, not of acoustic or electrosonic oscillations. Unfortunately, Hz is today applied indistinctly to both. One may indulge in theories of the harmonic resonance of pure sine-like sound waves, and claim that the perfect electromagnetic wave cycle is no different from the perfect sound wave. This reasoning by analogy may well fit a science of quantum acoustics where "phonons" ("sound particles") are treated quantically as if they are photons - an accepted situation today - and where there exist waves disembodied of energy and power. Worse still, the Earth's acoustic signals "that are called seismic but appear not to be seismic" (see separate subsection below), are theorized to form gravity waves that travel at c, the speed of light. But the physics of sound, as we have amply proven [8], is different from that of light and heat, i.e. from the physics of photons. It involves, not the interaction of photons with electrons and molecules, but the interactions of *sonic ambipolons* with electrons and molecules.

Be this all as it may, Dunn suggests rather glibly that his pulse generator requires some priming: "the equipment that provided the priming pulses was most likely housed in the subterranean pit" [33]. What priming means in the context of capturing "the Earth's pulse", Dunn does not say. Presumably, the undefined pulse generator would strike at the frequency of the undefined Earth's pulse, but had to be fed the same signal before resonant amplification set in. Whatever the "equipment" was that did the priming, and how, Dunn does not tell us in any of his publications we have read.

Once primed, the Earth's pulse would travel through the stone to the Queen's Chamber. To explain the 1/2 inch layer of salt found covering the walls of this chamber, Dunn suggested that chemical solutions were pumped down its northern and southern shafts, filling them until they made contact with the copper electrodes found by R. Gantenbrink's robot in 1993 on a wall "door" or slab blocking the passage of the northern shaft of the Queen's Chamber. Later, Dunn argued that the east and west pits found outside the pyramid were the ultimate source tanks for these chemical solutions, which would have to be pumped up from the pits and then flow down the northern and southern shafts into the chamber. One obvious objection to this idea is that despite the controversies discussed by K. Hamilton in his "*The Great Pyramid - a layman's guide*" (part 2, pp. 61-

63), the southern shaft was originally found closed and the northern shaft only partially open.

Dunn originally claimed that the solutions consisted of "diluted hydrochloric acid" and "hydrated zinc" (a poor term for zinc hydroxide since zinc hydride is highly unstable), and that their mixing resulted in the liberation of hydrogen gas. Though Dunn nowhere states it, presumably if his reaction actually took place, the salt covering the chamber walls would be "butter of zinc", i.e. zinc chloride, $ZnCl_2$. If so, it would have been a rather easy matter to chemically and spectroscopically confirm its presence before the Egyptian government cleaned the Queen's Chamber (it could even be done today with any residual material). In reality - that we know of - no chemical analysis of this salt has ever been carried out. Further, in all likelihood, the salt in question is sodium hydroxide - which is generated from sodium chloride or sea salt by electrolysis (see the second communication of the present series) - and/or potassium hydroxide if the Blue Nile were the source. Whether formed in solution or at the cathode, sodium (or potassium) hydroxide in a gel state is easily transported by electric currents - as can be seen on current-carrying wires that belong to the cathode branch of a circuit where the electrodes are immersed in a variety of salt solutions, including sea water. We suggest this on the basis that, if an hydraulic ram existed inside the Great Pyramid, the upwardly propagating electrosonic currents of electrons would transport salt if the ram's water was somewhat brackish.

However, in his more recent book, Dunn ventures the possibility that his proposed chemical reaction may not necessarily have been the case. In Appendix D to that 2024 book, he reprints a paper by the chemist B. Cohen which suggests two alternative reactions different from that which Dunn proposed [34]: (1) if the reaction employed sulphuric acid rather than hydrochloric acid, it could react with the calcium carbonate ($CaCO_3$) component of limestone (that also contains CaO) to release hydrogen gas from the dissociation of the acid; (2) if instead of either acid it employed a saline solution of ammonium chloride (NH_4Cl, aka sal ammoniac, well known and mined by the Egyptians), this could react with zinc chloride to also release hydrogen gas. In the first case, calcium sulfate (gypsum) would be deposited on the walls of the chamber, and in the second, metallic zinc plus zinc chloride again. Notice that none of these reactions generate *atomic* hydrogen, but hydrogen *gas*.

Essentially, Dunn's model needs a chemical reactor inside the Queen's Chamber because it argues that the King's chamber is actually a maser cavity operating in resonance with the microwave hydrogen line (21.1 cm). However, this line is emitted from atomic hydrogen, not from hydrogen gas or molecular hydrogen - leaving us with the quandary of how hydrogen gas was *homolytically* dissociated into atomic hydrogen (a free radical, not an ion), which it cannot do via ionization (heterolytic dissociation). It is worth noting that hydrogen gas requires at least a photon energy of 4.5 eV to cleave into atomic hydrogens.

To further buttress his claim that hydrogen was generated in the Queen's chamber and transited to the King's Chamber (which implies that the portcullis had to be open), Dunn goes as far as suggesting that cracks on the granite roof slabs of that chamber and the damage to its coffer may have been due to "an hydrogen explosion that probably followed a cataclysmic event that overcame the Earth and destroyed most of the existing civilization" [35]. We note that, without any invocation of an hydrogen explosion, the sustained damage can be simply explained by a series of cataclysmic events, which could be just the cumulative millenary result of violent earthquakes such as the one which struck the plateau in the XIIth century AD.

In his first (1998) book [32], Dunn thought that the Earth acoustic vibrations would generate a piezoelectric effect on the granite slabs of the Queen's Chamber and that, induced by the priming action, the vibrations would increase in amplitude until they "energized" the released hydrogen inside the chamber to diffuse across the Grand Gallery where it was "acoustically amplified". Upon realizing later (in his 2024 book) that the red and brown granites used in the Great Pyramid were poor in quartz (ca. 12%), Dunn embraced instead a different hypothesis - that the Earth vibrations resulted in pressure waves responsible for the effects of petroelectricity - which he termed the "Freund Effect", as if Freund had discovered them or the unique source of petroelectricity.

Freund - a NASA scientist - and co-workers investigated the development of crystallization defects caused by the incorporation of H_2O and CO_2 during the formation of igneous rocks in the context of searching for pre-earthquake signals. Freund proposed a new hypothesis regarding the source of petroelectricity. Water incorporated into rocks would become oxidized into peroxide anions, O_2^{-2}. Petroelectricity resulted from the splitting of the oxygen-oxygen bonds of these anions in compression-deforming and

grinding of rock [37]. Rock fracture had been previously suggested to be the mechanism responsible for the electron excitation and optical emission associated with the formation of plasmas in rocks, and with their emission from rocks to the atmosphere [38-39], even though it is difficult to see how fracturing could sustain prolonged chemical luminescence in the surrounding atmosphere. Freund's hypothesis filled this gap by invoking semiconductor physics.

Freund's thermoacoustic model proposes that when granite is subject to seismoacoustic pressure at 3-6 cps, it releases "positive electron holes" (an euphemism for ion-shared electron vacancies in semiconductor theory) from its peroxy bonds. At the Ames Research Center, Freund mechanically stressed bars of granite and demonstrated IR (infra-red) emission from their surfaces. By connecting across a current meter the opposite ends of the granite bar, Freund showed that the stress provoked a current of electrons. He explained it in terms of semiconductor theory - and in a rather glib and confusing manner. Essentially, while electrons flowed in the external conductor circuit, "holes" propagated in parallel inside the rock, at "about 100 meters per second" [40]. Freund thought "they are very fast", yet we can formally demonstrate that their velocity is 5 orders of magnitude slower than that of the electrons exiting the bar - which must also be their velocity inside the bar. This casts severe doubt on the validity of the hole currents borrowed from semicondutor theory. Instead, it suggests that the first electrons that are emitted by the rock come from volumetric layers closest to the rock surface, with those further inside coming out later. But since Freund polarized his bar, the first electrons will flow from layers closest to the cathode, and the last from layers closest to the anode. The hole velocity he reports is simply the *retrograde rate* at which "shared valencies" become vacant in his polarized rock bar.

Appendix B to Dunn's 2024 book reprints a 2016 lecture of Freund where he shows the release of 630 nm IR photons (in the 1.97 eV range) from a mechanically compressed granite bar. He explains how this happens by arguing that when the "charge carriers" (presumably the peroxide anions) come to the surface of the rock, they recombine: "during this recombination, these charge carriers release energy, and these two oxygens, they become suddenly about 20,000 degrees hot vibrationally and they emit [a] burst of infrared radiation" [41]. We can confirm this temperature with the aetherometric method [42] based upon our analytical and experimental [43] discovery that

$$kT = h\upsilon$$

We find the temperature of these 630 nm photons to be exactly 22,838 °K.

As mentioned already, the next appendix in Dunn's 2024 book - poorly written by E. Wilson - suggests, somehow, that in a rock formation comparable to that of the Great Pyramid, the "Freund effect" could establish a potential of 100 kV "and up to 6 million amps". No technical details, speculative or otherwise, are given to buttress this extraordinary double claim: how do we go from 1.97 eV photons to electron potentials of 100 kV? We shall return to this and the "Freund effect" in a separate, more technical section below. It suffices for now to state that while there are other more fundamental oxygen-oxygen bonds present in rocks than those of peroxide anions formed from trapped water, disruption of such bonds in igneous rocks is not the only source of petroelectricity, not even the primary one.

But let us return to the Dunn hypothesis regarding the Great Pyramid. The central notion is that "seismic-like" or geo-acoustic vibrations in the Earth - in the infrasonic frequency range - trigger electron release from rocks via the "Freund effect" with attendant generation of IR photons. These, somehow, are capable of ionizing air - even though they are not ionizing photons proper since they do not have sufficient voltage for ionization! But never mind that, as the atmosphere inside the pyramid is supposed to be hydrogen gas and the release of electrons from the granite rock surfaces would have sufficient voltages to ionize the gas, though we are never told in concrete terms what these voltages are, can or must be. In effect, not even the quantum frequencies of the kinetic energy of those electrons are mentioned. Dunn resolves these unknowns rather glibly, by saying that "the energy that filled the King's Chamber at that point became a combination of acoustical energy and electromagnetic energy" [44]. We may assume that in his model the acoustic energy is somehow transmitted by petro-electrons at 3-6 cps travelling at the speed of sound in rock, and that the electromagnetic energy comes from the IR oxygen lines with a quantum frequency of $4.75*10^{14}$ Hz. Now, the latter could only be amplified in an IR laser, not in a maser operating with microwave oscillations (maser is an acronym that stands for "microwave amplification by stimulated emission of radiation"). In reality, a maser operating with the hydrogen line of 21.1 cm would *require a much, much lower quantum frequency of electromagnetic oscillation*, on the order of 1.42 GHz. Such problems may be the reason why Dunn so downplayed the maser claim in his most recent book.

However, in fairness to Dunn - since he failed to spot the problems of his maser argument - it is entirely possible to build a maser that uses an IR signal to switch covalent electrons from low to high energy states - thus playing the role of the "pump radiation" in the maser cavity - whereas the tuned reception captures instead a lower frequency signal ("excitation radiation") to be amplified, such as microwave radiation. The IR signal could provide the pump energy needed for the electrons to transit into an intermediate energy state from which, by returning to the lowest or ground energy state, they could amplify the incoming photon signal (e.g. microwave) by stimulated photon emission, without amplifying any other "electromagnetic noise". This accords with conventional theory and engineering of masers - where the pump energy increases the number of electrons in the highest energy state over that which, by quantum distributions, corresponds to temperature equilibrium (or is permitted by it). The amplified emission exiting the maser cavity is then collimated into a beam. The amplification is seen to simply result from the predominance of intermediate states and their tendency to decay to ground states. That is how the maser is explained as a receiver-amplifier (even if to our minds much is left physically unexplained with respect to the amplification part, as it relates, precisely, to its production of photons). The relation between the strength of the applied magnetic field and the chemical nature of the paramagnetic cavity suggests that the critical tuning aims at the amplification of specific intermediate energy states, and that the pump energy is just a power input, only a part of which will be converted into the tuned amplification.

In prior publications, Dunn argued that the northern shaft of the King's Chamber was metal-lined and served as waveguide to input "a microwave signal into the King's Chamber" [45], which he calls "the resonant cavity of the Power Center" [46]. The "microwave receiver housed in the south wall" of that chamber was coupled to a "crystal box amplifier" (the actual maser cavity), so that the incoming signal "increased in power as it interacted with the highly energized hydrogen atoms inside the resonating box amplifier and the chamber" [46]. It then output a collimated beam which was "directed through the metal-lined southern shaft to the outside of the pyramid". Of course, the "crystal box", whether inside the coffer or otherwise, is long gone.

An obvious objection to Dunn's interpretation of the northern shaft as a microwave guide is Gantenbrink's finding that Block No. 23 of the shaft was found "partially unfinished", severely constricting the lumen of the shaft [47]. A similar objection can be

made to Dunn's idea that the southern shaft served as guide to the collimated exit beam. It, too, presents an unfinished ceiling that constricts the lumen at Block No. 5.

The maser claim component of the Dunn hypothesis looks somewhat "*rocambolesque*" in its science-fiction-like fantasy. Why, or what for, would the pyramid builders point due north, at a fixed angle to the skies, a microwave antenna waveguide for the hydrogen line - and at that, one with a substantial bend near 70° at the exit from the Kings's Chamber - and then, at a comparable fixed angle but pointed due south, emit amplified radiation in the same microwave line?

First off, it would make better sense to use some other line than hydrogen's if such an arrangement were desired - to select and amplify some constant stream of incoming weak signals, as if the pyramid's maser belonged to some kind of astrophysical energy-amplification relay. But, if that were the case, would one not want to use instead *moveable*, directional waveguides for the incoming and outgoing signals? Dunn simply glosses over these absurd paradoxes that surround the apparent uselessness of the proposed maser. Instead, he concludes that the width (that he gives [48] as 8.4 inches, corresponding to 21.336 cm) of the waveguide connecting that bent portion of the northern shaft to the chamber *is* confirmation of the hydrogen microwave line at 21.105 cm: "Amazingly, this waveguide leading to the chamber has dimensions that closely approximate the wavelength of microwave energy [at] 1,420,405,751.786 hertz [sic!]. This is the energy emitted by atomic hydrogen in the universe" [49]. More to the point, 1.42GHz is the marker of neutral *atomic hydrogen* (a free-radical) in the universe, whereas the truly universal electromagnetic marker of *ionized hydrogen gas* (i.e. protons) is 2.1 MHz, as discovered by G. Reber and fully explained by ourselves [50]. But, precisely, none of the proposed chemistries for the Queen's Chamber hydrogen-generator yields atomic hydrogen...

Irrespective, Dunn throws in for good measure the vague notion that the hydrogen atoms are also excited by the unknown "primed" acoustic oscillations, and that these propagate - as does the hydrogen - from the Queen's Chamber to the Grand Gallery, which Dunn calls "the acoustic amplifier". There, "only frequencies in harmony with the resonant frequency of the King's Chamber were allowed to pass through an acoustic filter, which was housed in the antechamber" [44]. To justify his claim of "energy amplification" by standing waves (a vague bit actually taken from Tesla), Dunn constructs a rather interesting hypothesis that could explain the periodic, regular square holes in the floor

ledges found right against the two walls of the gallery: these holes would support a series of vertical frames of Helmholtz-type resonators designed to respond to some input tone coming from the Queen's chamber and - we may add, since Vawter claims it so - from the Ascending Passage.

H. Helmholtz, a physicist and physiologist, described his invention of the resonator in his study of tones entitled "*A physiological theory of music founded upon the study of auditory sensations*" (1863). It consisted of a bulbous or spherical bottle where the air in the neck behaves like an oscillating piston and the air in the cavity, being relatively immobile, undergoes periodic compressions and expansions. Each resonator is tuned to a fundamental note or frequency to which it responds by vibrating and capturing energy from the incoming acoustic signal [51]. One can think of them as energy and frequency transducers. Dunn ingeneously claims that the main function of the corbelled Grand Gallery was that of a resonator "orchestra". He proposes that the latter consisted of some 26 sets of resonator frames, each frame proceeding upward, as the corbelling contracted upwardly, from larger to smaller volume spheres or Helmholtz-type resonators. After the Grand Gallery was cleaned of its "dust and soot" in 1998, burn marks showed on its limestone roof. Dunn claimed his model could explain the burn marks: "intense heat created by burning resonators had left an indelible signature etched into the limestone tiles" [52]. We fail to see how Helmholtz resonators "burn", or why they would do so. Incidentally, Vawter's analysis of the acoustics of the Grand Gallery proceeds as if the resonances were produced in air rather than in an atmosphere of atomic hydrogen.

As Appendix A to Dunn's 2024 book, Vawter presents a novel acoustic analysis of the corbels of the Grand Gallery as an octave E_3 to E_4 resonator that is tuned (in air) to a C_4 at 254.6 cps. Assuming the wide spectral range of any sound shockwave produced in air, there could be subharmonic resonances for many other different tonal families. In the second report of the present series, we will conduct our own aetherometric analysis of the acoustics of the Grand Gallery and the King's Chamber, and address in detail Vawter's findings. It suffices for now to stress - with respect to Dunn's hypothesis for the Grand Gallery - that resonant transposition of the frequencies of harmonics (sonic transduction of energy) does not necessarily imply "energy amplification" - or rather power amplification, as what can happen in a tube or transistor amplifier.

As to what was the function of the rather plausible system of acoustic resonances and frequency transpositions formed by specific chambers of the Great Pyramid, Dunn leaves the reader with the vague notion that sound was employed to excite atomic hydrogen. How that can be technically brought about, Dunn does not say. There are sound-controlled lasers today that employ "sound waves" with a controlled frequency to deflect the direction of the laser beam. But why would that matter if the input and output waveguides were directionally fixed?

Beyond a nebulous notion that the Great Pyramid acoustically tapped the "Earth's pulse" - with some positive feedback system that was primed - to generate petroelectricity, there is little that evokes Tesla in the sequence of energy-converters that Dunn put together. The reader is left wondering how exactly the petroelectricity is collected; and how it is made to polarize its energy into a cathode and anode of some charge-storage system - as Dunn's explanation for the "copper handles" found in Gantenbrink's door definitely requires. In a chapter with the hyperpromotional title "*The ultimate old and new green energy machine*" [53], Dunn reveals a completely improvised tidbit: "positive electron holes that are squeezed out of the igneous rock and flow upward to and through the electron harvester [sic] will combine with negative electrons in the Tesla dome, where it will radiate out in the same manner Tesla imagined, except [that] unlike Wardenclyffe Tower, which received power from a conventional power plant and distributed it wirelessly, the pyramid electron harvester dome is receiving electrons directly beneath its location on the earth's surface" [54]. This is what the reader waited for through 250 pages - the connection to Tesla that *outdoes* Tesla. But when it finally comes, it requires (for no good reason) that a dome for which there is no evidence whatsoever it existed, made of some material "yet to be determined" [55], be placed over the Great Pyramid, so that holes and negatrons will recombine "in the dome" to emit the same radiation coming out of Tesla coils. This is a big mouthful. One even doubts whether Dunn actually knows what a hole is supposed to be, let alone some path whereby a recombination of a hole with an electron results in the production of *Tesla radiation*.

Semiconductor theory holds that most recombinations of holes and electrons occur in recombination traps *without* emitting any *electromagnetic radiation*. But electrons and holes *may* recombine directly *with* attendant emission of photons - with the photon energy resulting from a little less than the energy of the band gap [56]. Since Tesla claimed that

the waves generated by the "transformer coils" he invented were *not electromagneti*c, we are hard put to see how the recombination of holes and electrons could generate Tesla waves or Tesla radiation at all! Dunn has not even understood that, theoretically, "holes" are valence vacancies shared by a group of atoms such that, when each of them "holds the hole", it momentarily becomes an ion. Any more than he has understood that when an electron finally comes to occupy such a vacancy and this happens to generate some photon, this electromagnetic radiation is *not* what Tesla coils or, for that matter, any induction coil emits, whether at the different or indifferent poles - which, as we proved through a rigorous experimental inquiry, is ambipolar radiation that travels through both the media of air and ground [57-58].

This pseudo-Tesla turn of Dunn really is nothing but a cheap publicity stunt. He wishes to hammer in some connection of his "green" model to the name of Tesla, and comes up with the "Tesla dome" in the hope it will help marketing his books, *Atlantis Rising*, and some nebulous investment into replicating the "ultimate green machine". The world is filled with pseudo-Teslas, and one more will not make any difference. One is reminded here of the puerile antics of P. Flannagan (famous or infamous for his *Pyramid Power*) placing a frame-pyramid over a vertical Tesla secondary and receiving on his insulated body a long spark discharge at a distance. Meaningless showmanship. As if there was something special to the mere geometry of a "sacred" pyramid... Any object just about could do the trick, from the original capacitative aluminum donut often used by Tesla himself, to a cube or a sphere or whatever. That is what Dunn re-edits as a "Tesla Dome" - the capacitative element that can be connected as a floating load to a Tesla secondary - which, unfortunately, he draws [55] as reaching down to the ground... Tesla must have surely jolted in his grave.

We see no need to enumerate the many objections - all of a scientific nature - that we have already made above to Dunn's hypothesis, or his particular grouping of hypotheses. Throughout the 2024 book, he claims to lay the scientific foundations for reverse engineering the Great Pyramid as an energy machine. But every bit of science is distorted into fantastic notions and connections that barely hang together. It is embarassing to remark that the pretention to connect the Great Pyramid to Tesla turns out to be an exercize in marketing. A keen example occurs when one expects Dunn qua engineer to come up with some physico-mathematical analysis of the magnitudes of power

and energy input and output in his model of the pyramid machine but, no, no such technical speculation is forthcoming. In its place, Dunn performs a quasi-economic study of what would be the cost today of building a pyramid and frog-leaps from this cost to what would be the output power corresponding to such an investment: 25GW [59]. Instead of science, we get scientism and marketing. They inevitably date Dunn's model by a corny complex of "post-modern" social fads: "Resonating with the life force of Mother Earth, the Great Pyramid of Giza quickened and focused her pulse, and transduced it into clean, plentiful energy" [60]. Instead of a solid scientific speculation, the reader gets poetic shreds of green-faddist superstition. That is the worst objection one can make against Dunn's hypothesis regarding the Great Pyramid of Giza: it fails to be a scientific hypothesis, and it fails in the details of the proposed engineering. Yet, the original impulses of his work were filled with promise.

4. A basic note on the concepts of holes and phonons

The concept of a hole arose from the post-WWII work of Brattain, Schockley and Bardeen at the Bell Telephone Laboratories that led to the invention of the transistor. The concept is closely associated with the treatment of electron and neutron scattering and with Landau's theory of phonons and rotons [10]. One central notion is that the electric resistance of a current - and the resistivity of materials - results from the *scattering of electrons* caused "by anything that gives a deviation from perfect periodicity of the lattice potential" - which can be factors as diverse as lattice imperfections, the thermal motion of the atoms of a crystal or a metal, grain boundaries, etc [61]. The theory claims that, at microwave frequencies, the "anomalous skin effect" that affects conductivity in thin wires and films is due to the *diffuse scattering* of electrons at the metal boundary, rather than to the classical specular reflection of electrons [62]. The other central notion is how Landau modified Debye's theory of elementary excitations, which were taken to be both transverse and longitudinal sound waves. Landau restricted these waves to longitudinal modes called phonons, and introduced "a new type of excitation called rotons, corresponding to rotational motions of the liquid" [63]. For the aetherometric deconstruction of the analytical concept of the phonon, the reader is directed to reference [10].

The energy-band (lattice) theory of solids assumes that the nuclei of atoms undergo small oscillations that constitute characteristic *phonon modes*. It holds that in pure

metals most of the heat is transported by electrons, whereas in high resistivity alloys and nonmetals (dielectrics, semiconductors), heat is mostly carried by *phonons*. To quote from the horse's mouth, the theory further assumes - as justified by the Born-Oppenheimer "adiabatic approximation" - that covalent electrons that are tightly bound to nuclei oscillate with these nuclei, whereas covalent electrons of the "outer orbitals" present orbital overlaps that distort the nuclear vibrations [64]. In this manner, a crystal is taken to be a system of ions and "valence electrons", and the "total wave function" of the system becomes the product of the "nuclear wave function" by the "electronic wave function". When a valence electron leaves *an ion* (which is generally treated, not as an ion, but as a group of ions, see below), to quote H. Callen, "the total magnitude of the exchange charge is [or becomes] equal to one positron" and "this effective positive charge which surrounds any electron really represents a region of electronic depletion (...) where there is less than the normal probability of finding other electrons. This region is called the *Fermi hole*" [65].

A positive charge is now associated with the vacant lattice region, so that if a free electron approaches it, it may become *trapped*. Its "electronic wave function", "similar to that of an electron trapped in an atom in a vacuum" [66], will spread over "many atomic distances" and thus involve more than just one ion. Thus, the positive charge is shared by a group of atomic nuclei with their tightly bound electrons - that is, ions - and "one can think of the electron as describing an "orbit" through [a number} of positive ions" [66]. In this manner, the "anion lattice" hole is no longer a single positive ion or a simple valence vacancy, but a positive charge (a positron, says Callen) shared by a number of ions (really, quasi-ions). Conversely, if an actual positive ion leaves a lattice region, a negative hole will form. Most recombination traps occur on free surfaces of solids, but electrons and holes *may recombine directly with the emission of photons*, with the photon energy resulting from a little less than the energy of the band gap [56].

5. The limitations of the "Freund effect" as source of petroelectricity

Granite is a rather beautiful igneous rock with many varied combinations of metal and other oxides (silica, alumina, potassium oxide, soda or Na_2O, calcium oxide, iron oxides, magnesium and titanium oxides). The intercalation of these oxides does not have to be explained by the presence of holes - as per semiconductor theory. Trapped water may work as a lubricant of igneous rocks, but it is not the major source of valence vacancies

("holes"). In these oxides of granite, oxygen-oxygen bonds exist along with double bonds of oxygen to metals (as they do in maghemite, hematite and magnetite). Though the chemical structure of these complex oxides may not be resonant - like the pi bonds of carbon-based benzene are - it may function as an electron trap and even, as we found in our study of maghemite and magnetite, allow electrons to "flow through" the molecule, that is, function like a channel. Or, still more to the point as we ourselves discovered - allow electrons to move through noncovalent, resonant hexagonal structures of molecules that evoke the Kekulé model for the benzene ring. An electron lost from maghemite turns it into hematite, but a flux of electrons through the resonant structure stabilizes the molecule. Furthermore, any lost electron can also be trapped noncovalently between oxides, just as the oxides also trap water. Likewise, the unpaired "outer" covalent electron of superoxide anion, just as well the paired "outer" covalent electrons of peroxide anion, can couple magnetically and form ("weakly attractive") stacks with other such electrons of these anions in a manner that cancels their electric repulsion and results in very strong double (pi) bonds forming between the different oxides. Paramagnetic granite is composed by multiple such bonds.

When granite is compressed mechanically or acoustically, some of these stacks may extrude two kinds of electrons as the rock increases its diamagnetism: those that were trapped noncovalently in stacks formed between different oxide molecules, and those that, though part of a stack, were covalently bonded to an oxide molecule. The latter typically result from the dissociation of an oxygen single bond, leaving behind mostly *oxide anions* and atomic oxygen as the bonds of the rock are severed and the latter turns into oxide dust. Aside from these electrons, of course, there are also the two populations of intercalated *free electrons of state* which our work in thermodynamics has identified [67]. It follows that petroelectricity - including the electron, proton and oxide anion plasmas that it produces and injects from the ground (from the rock) into the atmosphere - has a complex source. In major seismic events, the rock compression, mechanical and sonic, is intense enough to break the covalent oxide bonds of rocks and enlist its electrons. But less intense compressions tend to mobilize only *free electrons of state* and noncovalently bonded electrons. Thus, the "Freund effect" - even redefined - cannot be the sole source of petroelectricity.

Irrespective of whether electrons or so-called "positive hole electrons" are mobilized by acoustic shockwaves in rock, be it granite or limestone, the question is what causes these waves, and also - whether they are real shockwaves or not. Elsewhere, we have put forth a novel theory of the seismic and pre-seismic waves involved in earthquakes [68]. We identified a precursor anti-gravitational (AG) ambipolar wave responsible for a variety of pre-seismic events or signs, and capable of displacing energy in the keV range. Conversion of the AG-wave into primary P-waves would occur at the *subcrustal hypocenter*, where transverse transfer of speed to longitudinal pressure waves that cause slippage and sliding of tectonic plates will be maximal, whereas transfer of energy itself will be maximal at the *crustal epicentr*e, to create the slower secondary S-waves responsible for transversal adjustments and most of the surface damage. Our first task at the time was identifying the source of the electric effects of the AG wave. We quote:

> "We begin by noting that the atmospheric lumination is a phenomenon coextensive to IR emission, and to any anomalous local increase in heat - not just blackbody heat, but sensible and latent molecular heats. According to our general theory of Aetherometry, no such blackbody emission and molecular heats are possible without release of kinetic energy from electrons and other ions in the atmosphere. The likely source of this kinetic energy, according to our general theory, is the electric field acceleration imparted by an altered flux of ambipolar radiation - in the atmosphere and in the ground. Such a flux would have to reach [many] kiloelectron volts of energy if it were to generate visible and IR emissions. Ground and atmospheric emission of ambipolar fields in the keV range would attain levels comparable to those of solar ambipolar radiation impacting the Earth's atmosphere, and would therefore be perfectly capable of interfering with the transmission of radio signals - increasing broadband noise and attenuating the signals without having to invoke any ionization mechanism per se. In fact, whereas solar ambipolar radiation is largely attenuated and absorbed by the ionosphere, mesosphere, stratosphere, etc, such that the interference at ground level is minimized, ground emission of keV ambipolar radiation would impact ground-transmission directly. Since in our general theory all 'propagation' of electromagnetic signals is an indirect epiphenomenal result of the propagation of ambipolar radiation, emission

> of ambipolar radiation in the keV energy range would directly interfere with the lower-energy ambipolar waves involved in the transmission of radio signals.

Thus, the actual source of petroelectricity is not the rupture of oxygen-oxygen bonds or of the hydroxyl bonds of trapped water - which do not of necessity have to happen - but the emission of sonic ambipolons in the keV range that mobilize free and bonded - noncovalently at first, and eventually covalently - electrons from rock oxides. We identified acoustic AG wave velocities between 500 and 18,000 m/sec (see table 4 of [68]). We will show, in the second report of the present series, how these correspond to sonic ambipolons in the keV range.

In this aetherometric context, let us again consider Wilson's claims in that Appendix C to Dunn's 2024 book: the 1.97 eV photons of the "Freund effect" are taken to be just a mechanical result of the granite compression, nothing else. Yet, it is easy to aetherometrically demonstrate that they can only be explained as an emission from electrons that acquired the kinetic energy of 37.8 keV - which implies these electrons had to have been energized by 37.8 keV sonic ambipolons. Freund remained woefully ignorant of this determination. Moreover, unless some other capacito-inductive coupling were to be employed to reach 100 keV - or 100 kV, no matter - as claimed by Wilson and Dunn, the *maximum voltage* of the petroelectrically-emitted electron plasmas responsible for the Freund photon signature may well be only ~38 keV.

6. Conclusion

We have succinctly examined the hydraulic models of the Great Pyramid as an energy converter that were proposed by Kunkel (suction pump) and Cadman (ram pump), and found them to be rather dubious because of their technical inoperability and details that are inconsistent with the data of the surviving pyramid structure.

We next examined Dunn's model - which is an hybrid complex hypothesis that cobbles together an acoustic "terrestrial" resonator, a chemical hydrogen generator, an hydrogen maser receiver and emitter, plus an undefined petroelectricity collector. We failed to see what geo-acoustic signals his model amplified (on the Schuman frequency question, the reader is directed to [69]); found that his chemical generator of atomic

hydrogen, no matter what chemistry was suggested, just could not operate in the Queen's Chamber as described and required; that the latter fact negatively impacted his model of a King's Chamber maser, which, besides, had no apparent utility, nor could be implemented properly by its existing shafts; and that, finally, Dunn provided no technical details either as to how his model would harvest the electrons from the petroelectricity of compressed granite, nor exactly how granite would be compressed - let alone how the Great Pyramid would function to generate non-electromagnetic Tesla radiation.

In our view, Dunn neglected the acoustic features of the Great Pyramid and the other pyramids of the Giza plateau. He could have taken advantage of Vawter's acoustic analysis to figure out that he needed something other than seismo-acoustic or "earth-resonant" frequencies to develop a power plant operating with acoustic impulses and sonic power. He took the failure of Cadman's ram model too much for granted to realize that only a ram, properly engineered and compatible with the data of the Great Pyramid, could have provided the needed power and the acoustic impulses.

Where these models failed is where we will pick up the thread in the second report of this series, which is also Ch. 1 of the last volume of AToS [70]. We will venture a totally different hypothesis for the integrated power-plant and acoustic functions of the pyramids of Giza. And we will provide the computations and physics to back up this involved hypothesis, along with a survey of other pyramid complexes found all over the planet, with the objective of finding out whether our hypothesis may have a more generic claim of applicability.

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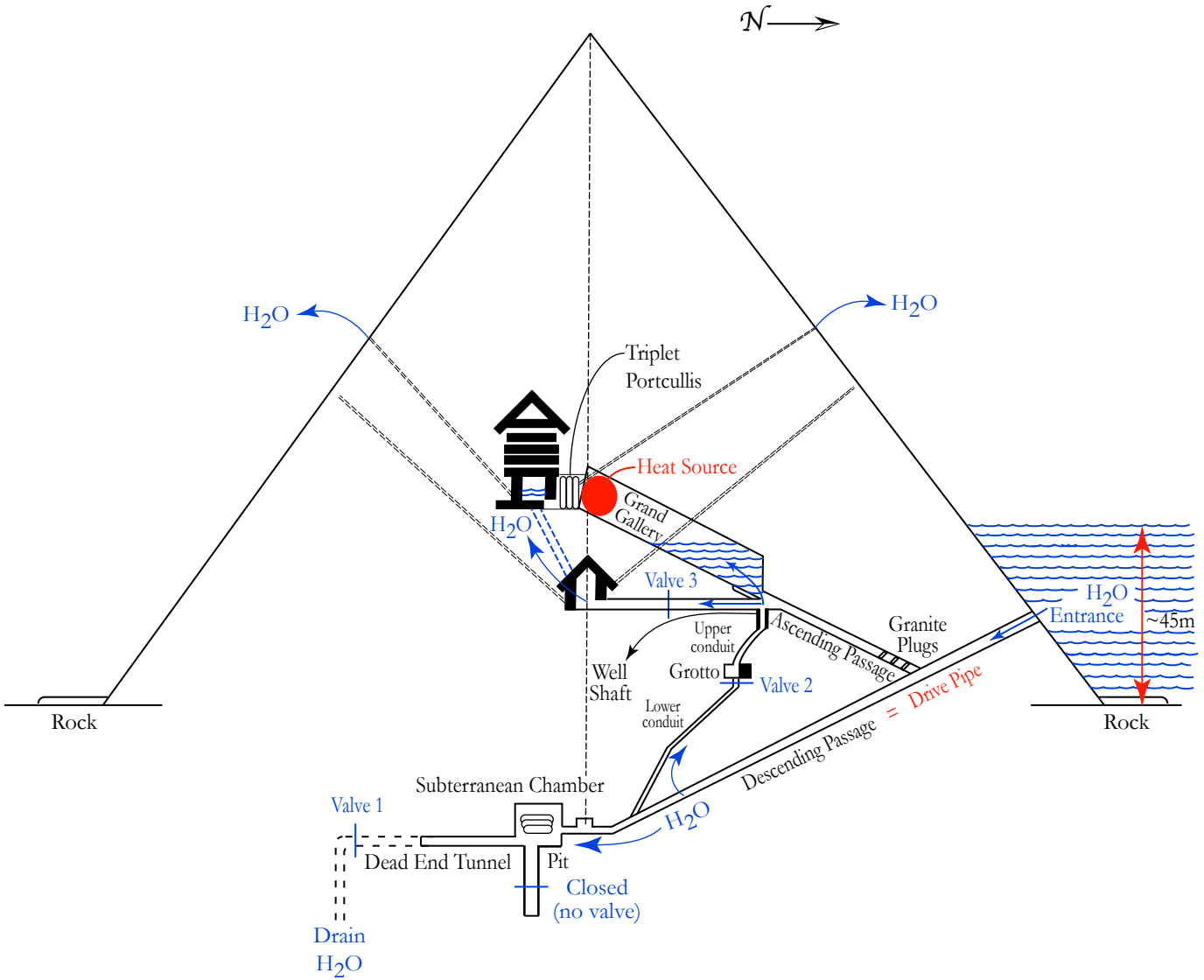
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Figure 1



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Figure 2

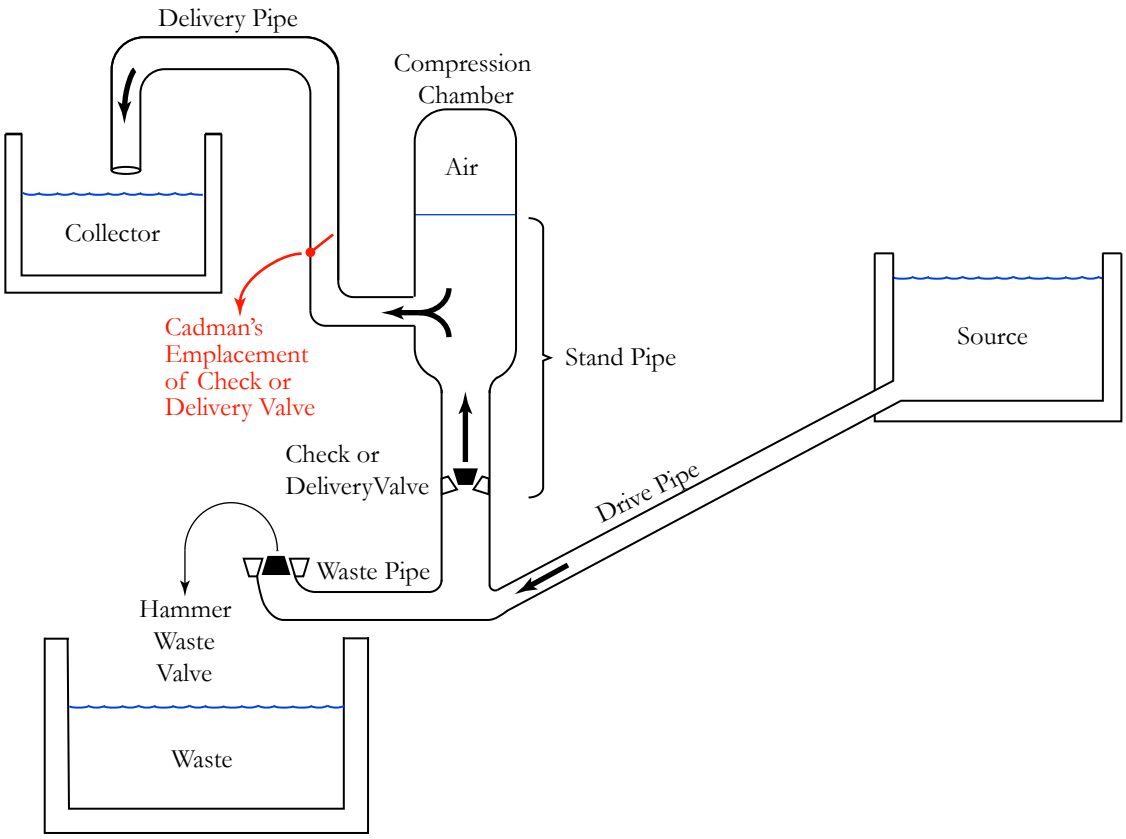
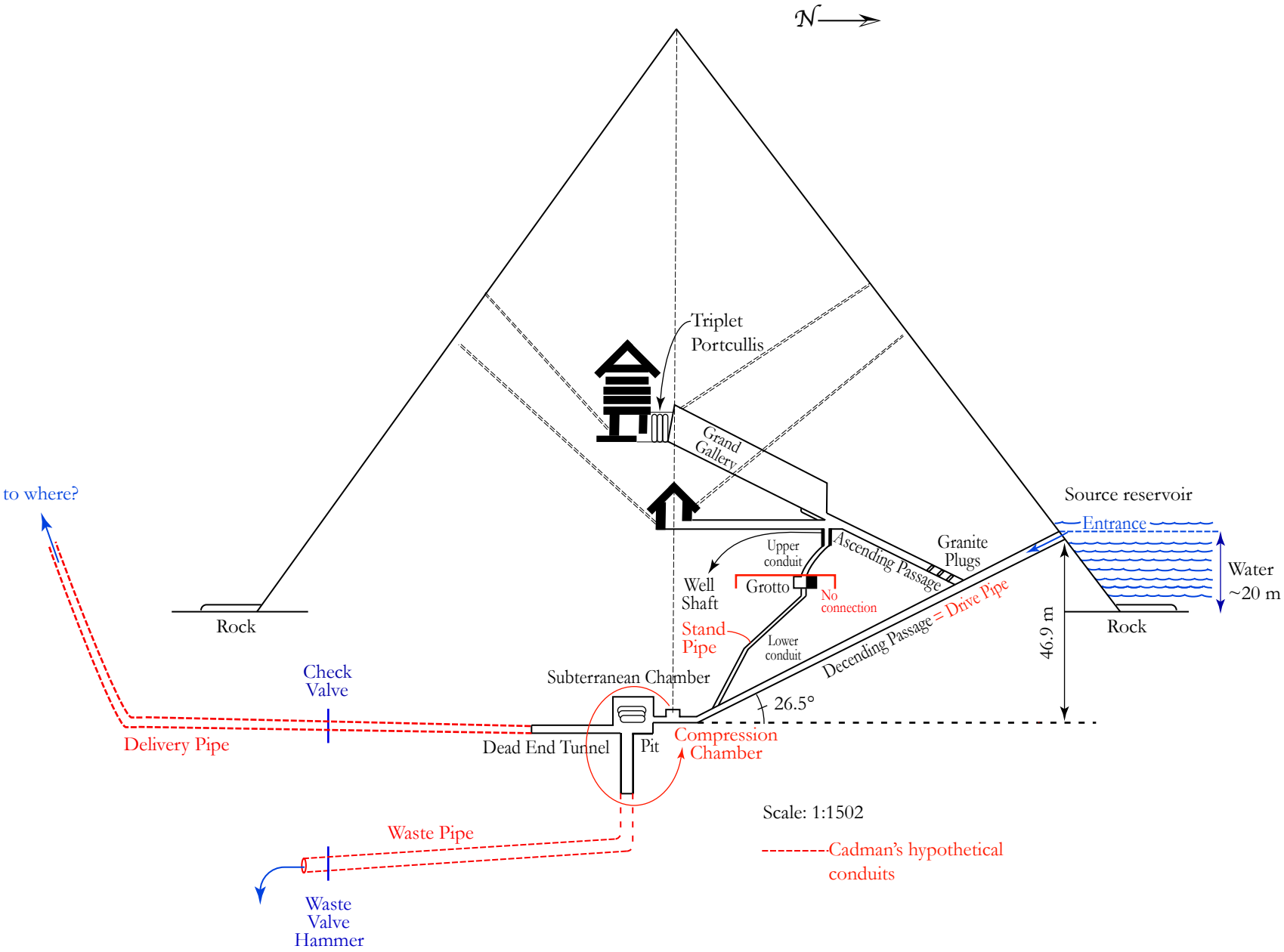

Delivery Pipe
Compression Chamber
Air
Collector
Cadman's Emplacement of Check or Delivery Valve
Stand Pipe
Source
Check or DeliveryValve
Drive Pipe
Waste Pipe
Hammer Waste Valve
Waste

Figure 3

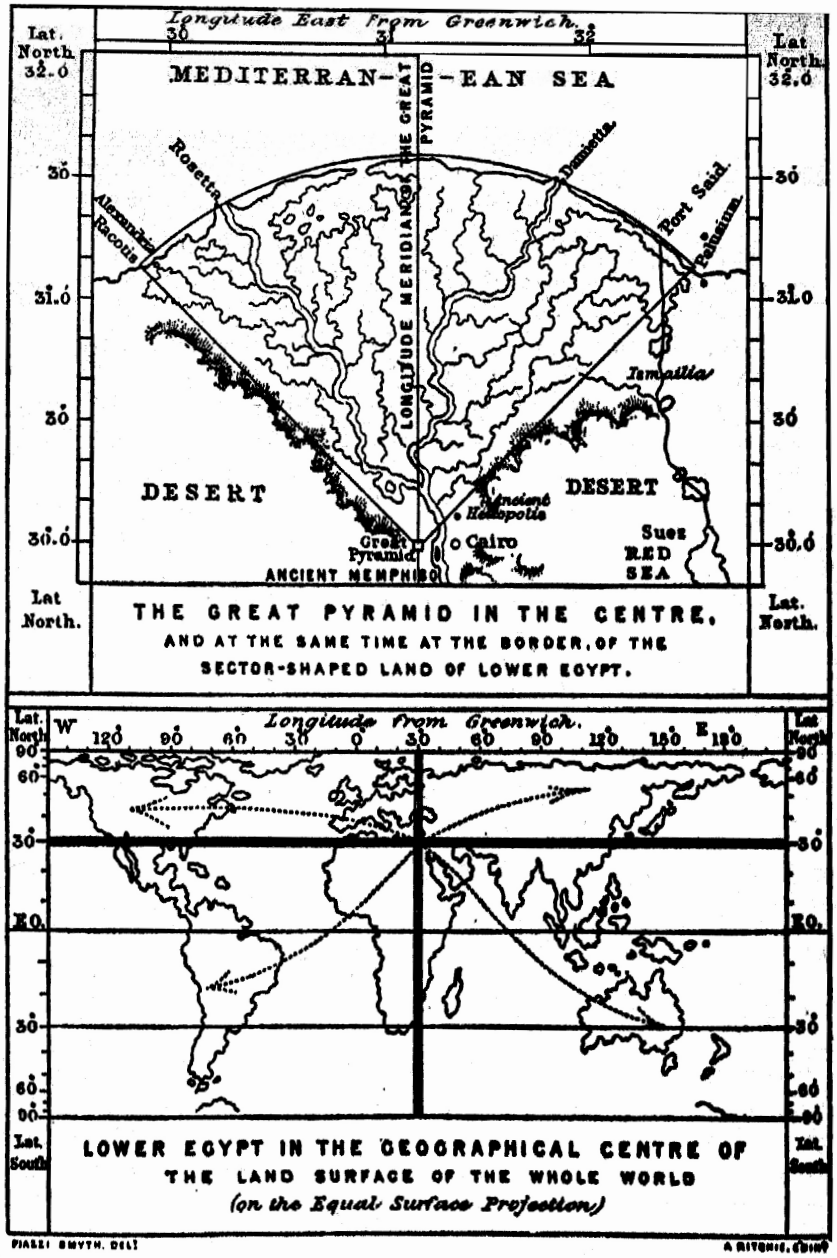
Cadman's Ram Pump



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Plate 1



The Great Pyramid at the centre of the earth's surface. Illustration from Piazzi Smyth's *Our Inheritance in the Great Pyramid.*