Primary Water Research

Demonstration Sites and Laboratory Research

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Summary

Conventional hydrology speaks of a static supply of water created once early in the Earth's history constantly being recycled. However, the work of Stephan Riess and others has demonstrated that another source of water, called primary or magmatic water, is generated within the Earth's magma. It flows vertically from beneath the surface, adding to the hydrologic cycle.

According to the U.S. Geological Survey: "The water cycle describes the existence and movement of water on, in, and above the Earth. Where does all the Earth's water come from? Primordial Earth was an incandescent globe made from magma, but all magmas contain water. Water set free by magma began to cool down the Earth's atmosphere until it could stay on the surface as a liquid. Volcanic activity kept and still keeps introducing water in the atmosphere, thus increasing the surface-an-ground-water volume of the Earth."

Primary water is perpetual water. (Arnold, 1960: 5; Burridge, 1954: 21) Unlike conventional aquifers, primary water sources likely will continue to yield water continuously over very long periods of time regardless of climatic conditions. Its springs have been flowing for thousands of years and have not fluctuated over long periods of time (Arnold: 1960: 4). Most primary water is pure and does not have to be treated with harmful substances in order to become useful for domestic and agricultural purposes. (Arnold, 1960: 5)

Primary water wells have been accessed in Africa, Central America, the Middle East and North America for many years. In these areas primary water wells consistently have demonstrated their ability to transform farms and local communities and economies.

Since the 1930s, Stephen Riess, a hydro-geologist and metallurgist, drilled hundreds of primary water wells in the United States, Mexico, the Middle East and Africa, which continue to provide water for communities. In 1959 Prime Minister David Ben-Gurion of Israel invited Riess to find water for the new city of Eilat in the Negev Desert. Riess struck water at a depth of just over 700 feet through solid granite, producing enough water to supply a city of 100,000 people.

In East Africa in 2007 a project called Maji Mengi (Abundant Water) was established to bring clean, safe water to villages suffering extreme water scarcity. Over 82 successful wells have been completed, serving thousands of families. The deep-seated water is bacteria-free and continues to flow throughout the year, even in times of drought.

Pal Pauer, a student of Stephen Riess, has accessed substantial number of primary water wells on several continents. He has maintained about a 92 percent success rate in locating and accessing primary water wells. Most recently, he has drilled over 50 wells in Kenya and Tanzania that produce between 1,800 and 3,000 gallons of water per hour. One well supplies water to 15,000 people and costs each person less than $30 a year.

Applied Research and Demonstration Sites

"Academic support for the existence and accessibility of primary water comes from metallurgists, petrologists, mining geologists and desert rats who know good and well that some spring waters did not originate in the atmosphere." (Rooke, 1954: 28)

Leonard da Vinci, in his famous "Treatise on Water," championed the idea that water comes both from precipitation and from internally generated sources.

In 1896 Adolf Nordenskjold, a Stockholm professor of mineralogy, published an essay, "About Drilling for Water in Primary Rocks," which won him a nomination for the Nobel Prize in physics in 1901, though he died before the prize was actually awarded. His research supported the idea that a new type of water was available, potable fresh water that is distinctly independent of the hydrological cycles of atmosphere water. He called this water "primary" because of its association with so-called "primary rocks," which geologists term magmatic, or those such as granites, basalts and rhyolites, which derive from the molten magma deep within the Earth and later cool to crystallize into igneous rocks. He affirmed that one could sink wells capable of producing such "primary water" year-round along the northern and southern coast of the Mediterranean Sea and the whole of Asia Minor, the best-known part of the world afflicted with aridity.

Shortly after the appearance of Nordenskjold's essay, his ideas about water newly formed in the Earth were echoed by a renowned German geologist, Edward Suess. Speaking with special reference to the thermal springs at Karolvy Vary, in the former Czechoslovakia, he made persuasive arguments to show that waters in this class issue from deep within the Earth, from the fundamental magma itself.

Suess' contribution was noted by Frank Wiggleworth Clarks, a geologist with the U. S. Geological Survey, who wrote that one of the most important questions for geology was whether it is possible to discriinate between terrestrial water and magmatic water.

Dr. Seuss' Bavarian student and protégé, Dr. Stephan Riess, a metallurgist, mining engineer and geologist, repeatedly demonstrated the existence and availability of primary water. He emigrated to the U.S. in the early 1930s where he continued to find abundantly

producing primary water wells for farmers, homeowners, communities and corporations. His applied research shows that primary water is generated in the rock strata when the right temperature and pressure are present. This water is then forced into fractures and fissures in the rock where it transverses over hundreds of miles. He saw new additions of water flowing vertically, from beneath the surface, adding to the hydrologic cycle. This water, in turn, becomes bound up on the surface, partially in plants, sediments and subduction zones on its way back out the Earth's mantle.

The Riess method uses mineralogy, petrology and structural geology precisely to locate high pressure/low temperature hydrothermal systems that have been encountered previously by engineers in mine and tunnel flooding incidents. (Fourlay,2007: 4). The Riess Institute at its Totten Field Laboratory, over the last decade, has drilled, collected and tested waters captured from great depths in a number of bore holes. Totten well 3, at 2,000 meters, indicates that some waters are not part of the hydrologic cycle, or rather from deep-seated geologic interaction within the Earth's interior

Several active Riess wells today are in Escondido, California and Cottonwood, Idaho. Several wells were located in the late 1970s on private property in Escondido. These wells are in operation today. The City of Cottonwood was running out of water and turned to Riess, who located three wells for them, one producing 600 liters per minutes and the others 1,200 liters per minute. All the wells continue to supply water today.

Stephan Riess, Bill Cox and Verne Cameron drilled many primary water wells that produced over 2,000 gallons per minute. Over 50 wells have been created in the Owens Valley in the middle of the California desert. Some of these wells, drilled in hard desert rock, generate 8,000 liters per minute. (FN Conversation with Pal Pauer, March 15, 2013).

The seminal research and work of Dr. Reiss is carried on, among others, by geo-hydrologist Pal Pauer, who is the world's foremost authority on locating and accessing primary water. He carries on the work of locating, drilling and accessing the plentiful availability of earth-generated primary water. Pal has located boreholes in the United States and Africa and currently is working on a project in the Marshall Islands.

Laboratory Studies

The existence of primary water also is supported by other recent research. In 2002 Japanese researchers concluded that there might be more water deep underground than in all oceans, lakes and rivers combined. The scientists first heated "mineral cocktails" to a white-hot 2,900 degrees F. and squeezed them until the pressure reached more than three million pounds per square inch. These experiments, which replicated the environment and conditions deep in the earth, produced water. The researchers concluded that the water produced within the earth is as plentiful as water from the oceans. (Gourlay, 2007: 1-2. For more information, see http://news.nationalgeographic.com/news/2002/03_0307_waterworld.html). This new water is being made all the time.

The researchers concluded that this water produced within the earth is as plentiful as water from the oceans. This conclusion is backed up by the recent discovery of massive fresh water found under the sea. Vincent Post from Australia's Flinders University, found an estimated 120,000,000 cubic miles of low-salinity water buried beneath the seabed on continental shelves off Australia, Chino, North American and South Africa. Dr. Post said that by combining information from seafloor water studies done by scientific or oil and gas exploration purposes, they have "demonstrated that the freshwater below the seafloor is a common finding, and not some anomaly that only occurs under very specifical circumstances." (Agence France Presse, 12/5/13).

In 2006 Dr. Christian Ballhaus and his colleagues of the Mineralogical Institute of the University of Bonn have concluded that if our planet did not have the ability to store oxygen in the deep reaches of its mantle there probably would be no life on its surface. Under close laboratory examination, the researchers subjected the mineral, majorite, which occurs at a depth of several hundred kilometers, to very high pressures and temperatures. They demonstrated that under these conditions the mineral stores oxygen and acts as an oxygen reservoir. Near the earth's surface the structure breaks down, releasing oxygen, which then binds with hydrogen from the earth's interior to form water (FN Gourlay, 2007: 1). This research was published in Nature, (doi:10,1038/nature06183. Further information is available at http://www.eurekalert.org/pub_releases/2007-09/uob-lrf092407.php.)
Dr. Graham Pearson, University of Alberta, Earth of Atmospheric Sciences, found a 1.5 percent water content in Ringwoodite.

In 2012, research by Belousov and Yu relates to coral reefs and magmatic water. This especially pertains to the Marshall Islands because the islands actually are atolls built by coral reefs. Their research revealed that volcanic activity at equatorial latitudes creates the necessary conditions for the formation of the great thickness of the cap rock of coral reefs, which may be as thick as two kilometers. This causes a rise in temperature in the depth of the earth's hyrothermal-magmatic systems. This dynamic's primary volatile component is water and the second is carbon dioxide. FN Belousov and Yu: 2012: 1-3

Existing Primary Water Wells

Fifteen years before the publication of his book, Hydrology, Meinzer wrote a long essay that referred to huge springs in the United States that yield 5,000 gallons or more per minute. This phenomenon is not confined to the United States. One incredibly productive water source flowing out of limestone is the Ain Figeh spring that alone supplies water for over one million residents of Damascus, Syria and is also the principal source for the Barada River. A report on this spring by the World Bank reads: "The principal emergence for the spring which has been enclosed in a structure since Roman times resumes an underground river several meters across which flows up and out of the limestone formation of the mountain. The total flow has averaged about 132,000 gallons per minute. The quality if very good, its temperature and pH are relatively constant, its

taste and color re excellent, and bacterial contamination at the source of practically non-existent (Cite?)

The Riess Institute raised the question of how does one explain the strange phenomenon of various and unexplained sources of water throughout the world that produce in excess of thousands of gallons per minute, often in areas with very little rainfall or in high attitudes. The following examples are particularly noteworthy.

1. Neftalies in the Sahara. In this region it rains an average of once every three years. Springs in Neftalies, however, provide enough water to support a forest of date palms and a population of thousands rendering it a fertile oasis.

2. Jericho in the Jordan Valley. Jericho, the site of the first walled city of antiquity, was built by a Neolithic people thousands of years ago. Jericho's spring supports a city of 24,000 people today. Called "The Sultan's Spring, it is identical to that spring "healed" by Elisha, reported in the Holy Bible in II Kings 2: 19-25.

3. A Figeh Spring, Damascus, Syria. This spring supplies water for over one million residents of Damascus and is also the principal source for the Barada River.

4. Tombstone Silver Mine in Arizona. This huge mine unexpectedly "watered out." At the 800-foot level the pumps were raising 2.3 million gallons of water daily. In 1909 a boiler breakdown had shut down the drainage system and before repairs could be made the entire complex had been drowned.

5. Mount Whitney, the Sierra Nevada Mountain Range in California. At the 13,000-foot level on the slopes of Mount Whitney in the Sequoia National Park and well above all drainage in any direction there is a sheer granite wall with a protrusion on its face that cups a small lake that remains full and constant even in the dry summer months. Its water chemistry and temperature point to deep origins. (The Riess Foundation website. Pages 1–2. Accessed 2/20/13)

Current examples of Riess wells follow.

1. Lakeside, California. Sparkletts Drinker Water was on the brink of disaster because their water source began to fail in 1955. The President of Sparkletts heard of Stephan Riess and invited him to find water. Riess found a new well 500 feet lower than the original well. In 1995 the well was measured to be producing more than 300 gallons per minute of pure high-grade water.

2. Thermal, California. Riess drilled a well into the rocky heights overlooking dry and barren flatland. The well created a small lake supporting a 450-acre citrus orchard and has been replenishing the land for over a quarter of a century.

3. Camarillo, California. In 1945 learned that a family was about to lose their farm due to lack of water. Riess punched a well less than 300 feet deep in 4 ½ days, with a flow of pure water at 700 gallons per minute.

4. Ramona, California. Riess located thee deep wells on a thoroughbred horse farm. The land was formerly arid and barren but was converted to lush pasturage in the 1970s, creating a multi-million dollar oasis for racehorses.

5. Cottonwood, Idaho. In 1955 the city of Cottonwood was running out of water and the traditional expert geologists the city had hired to find water concluded that there was no hope of success. Riess immediately located two wells. The first generated more than 250 gallons per minute, the second, over 500 gallons per minute. At the city's request, Riess came back in 1968 to locate a third well, which produced over 550 gallons per minute. All three wells continue to supply Cottonwood today as they did over 25 years ago.

6. Eilat, Israel. Prime Minister David Ben-Gurion invited Riess to help find water for the new city of Eilat in the Negev Desert. In 1959 Riess struck water at a depth of just over 700 feet through solid granite, producing enough water to supply a city of 100,000 people.

7. Puebla, Oaxaca and Baja, Mexico. In the late 1940s Riess was invited to come to Mexico and he found wells in these three Mexican cities that are supplying water for their inhabitants.

8. Escondido, California. Riess and his successor, Morad, Eghbal, each located several wells in the late 19970s on private property both for the personal use of the owner as well as for the commercial water development for surrounding towns that need to purchase water. These wells are in operation and producing today.

9. Hamilton, Massachusetts. In the early 1980s Riess confirmed well sites and set up the Totten Field Laboratory. Three wells were drilled into granite and related structure and are producing more than 350 gallons per minute from fractures between 200 and 1,600 feet deep. The Hamilton Shear Zone Project at the Totten Field Laboratory has completed wells drilled beyond 1,000 feet in igneous rock producing more than 350 gallons per minute.) (The Riess Foundation website. Accessed March 2, 2013) Well #3 at the Totten Field Laboratory is an ongoing project with a 15 inch diameter hole currently drilled to 2,000 meters, known to be the deepest 10 cm. Cored water research well in the continental U.S. Results from Totten 3 indicate some waters there may not be part of the hydrologic cycle but rather from deep-seated geologic interaction within the Earth's interior (Gourlay, 2007: 5)

Other existing sites include the following.

1. Amboseli National Park, Kenya. Pal Pauer drilled a borehole that pump tested at 65 gallons per minute, with no draw down, however that was only because that was the maximum capacity of the pump used. Also it was only a six-inch borehole. It is possible that it could have produced 1,0000 gallons or more per hour if it were larger.

2.Villages in Tanzania. Lyn Hebenstreit, a member of Clear Water's Advisory Board, has drilled 85 successful boreholes, each of which serves 500 people, in dozens of villages who otherwise would not have water.

3. Elam Tribal land, Northern California. There are four primary water wells on Elam land.

Finding and Accessing Primary Water, Research Methods and Technology and Equipment

Primary water is found in deserts, under lakes and even in mountains (Rooke, April 1954: 28) It is frequently found where there is faulted, igneous and metamorphic rock. A hydrologist experienced in primary water can tell by the general lay of the land what the chances are of finding primary water. The procedure has to do with the angles at which faults and strata lie in relations to one another and to the points of the compass, what the composition of each is in relation to its neighbor and to themselves in depth. (Burridge, April 1954: 21).

Geophysical mapping and field observation are the most reliable approaches to primary water exploration. It occurs frequently where there is fault, igneous and metamorphic rock. It is often found under granite. Every farm and every community in a region of crystalline rocks can usually have its own wells.

Recently, with sophisticated airborne geophysical and satellite data groundwater and primary water can be located in rock using a technique called "fracture trace analysis." Large fractures are identified by satellite photography for exploratory drilling. (Gourlay, 2007: 5. An example of this technique can be viewed at http://ww.eric.com/au/docs.products/assessments/eric_ground_water.pdf.

Primary water can be accessible by drilling boreholes, at times between 50 and 150 feet, and often 200 to 2,000 feet. Wells are usually less than 1,200 feet deep. (Arnold, 1960: 5) Stephan Riess' shallowest well was 232 feet and the deepest was 1,400 feet. In some situations a hand pump can even be used.

Primary water can be produced locally, thus eliminating long and expensive pipelines and often storage facilities. It can be developed above the land where it is used and so can be transported by gravity flow. Because the distribution of primary water is through the force of gravitation, there is no cost to the user (Arnold, 1960: 4 - 5).

Some primary water is contaminated by terrestrial water when it reaches the surface. As Arnold points out: "The relative amount of contamination varies from point to point,… There is no accurate method of determining the relative amount of primary and terrestrial water which may be found at any point, nor how deep the penetration of the terrestrial water will reach. In general, however, further away from sedimentary beds, the primary water are (sic) located, the less the liability of contamination." (Arnold, 1960: 4)

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