Gardner's Beacon™

CAPE ANN AND SALEM PLANTER

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It has been a busy year: Year to date, 2023. We continue our support for the Heritage Society Community with a major focus being the 250th of the Declaration of Independence. Specific tasks relate to lineage research for successful application to a society as well as to extending information in the history of the involved families.

Two themes bear the most attention:

- origins of Thomas Gardner and Margaret Fryer are being studied as we have more information that was announced in February which will modify the basic story provided by Frank A. Gardner, MD (will be covered in the next issue);
- in February, as well, we became aware of the release by OpenAI of their ChatGPT system.

We will take the OpenAI action first as the organization has recently announced the release of their ChatGPT Enterprise which raises the stakes in the game significantly. However, a few comments are in order before we dive into the details.

Present, Past, Future

Our posts and articles have dealt, and will deal, with the topic of the long reach of New England. From the start of 400 years ago, through the upcoming 250th of the Declaration of Independence, over many generations, we can see the involvement of people (and their families) and the institutions of New England. Of the many possible examples, we will mention two: Ipswich and Ohio; Lawrence, KS as a project of Massachusetts. Too, everywhere in the U.S. there have been improvements in technology as the world progressed.

Another example of far reach is the Institute of Electronic and Electrical Engineers (IEEE.org). As a PR blurb once noted, the IEEE has been everywhere. Think of the U.S. moon landing happening without the IEEE's involvement. And, as we know, there were many other engineering disciplines plus lots of contributions across the sciences and arts that played a role in that program. Of late, STEM has gotten attention: science, technology, engineering and mathematics.

One focus, of many, for our organization is technology which is a broad subject. As we discussed in a last issue of the newsletter, we modeled this choice after the Gairdner Foundation of Canada who chose biomedical research. Are there other fields that could be of interest?

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What the 20th century brought was the computer that provided ways and means to accomplish the goal of influencing life for the better. We have seen lots of progress from systems that were computationally boosted. NASA's work is an example. The Space Shuttle flew in an autopilot mode on the return trip during times that needed precise control which is beyond human attainment. At the same time, we had humans performing algorithmic calculations which equate to computing. This is still the reality. Everywhere there are computers doing things, people are involved in various roles.

Science is not possible now without serious assistance by algorithms. Our culture runs on the computer, perhaps too much. And, choices being made now will make the computer's intrusion into human affairs even more of a fact whether we, the people, like it or not.

Last year, OpenAI, one of whose founders was Elon Musk, released a system with a claim that it was representative of the "holy grail" which is called artificial general intelligence (AGI). Some use "strong AI," as there are many ways to characterize the proposed ability of the computer to match up with humans.

AI? It is a product of New England, too. The term was coined by mathematicians (for the most part) who met at Dartmouth in the 1950s and who continued the work over their career. IEEE Spectrum wrote of the group: The Meeting of the Minds that Launched AI (see image). There is a lot more to the story between this meeting and ChatGPT's release that we will be looking at, in depth.

How do we start to fill in some of those pieces? As we work on presenting a cohesive few of AI, we will include aspects related to **present** choices, the factors involved which includes considerations from the **past**, and some assessment of notions about **future** ramifications. From a technical sense, we will illustrate how many decisions being taken now circumvent influences from the past. This is even done by choice. Partly, the issue of proper decision making relates to limitations of technology; but humans have their limits, as well. Is that not where one could hope that technology will act in a complementary manner?

Expect this theme to continue in our discussion.

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Technology

Our thrust in technology entails that we pay increasing attention to computing as time goes on. Our interest is broad, but we are following our mode of tracing influences of New England. There are many avenues to follow with many focus types at hand. Example: Knowability. New England for us includes the south (Virginia, et al) as well as our northern families. Too, working with families that lived through the frontier (western) experience, we have encountered many situations where someone from the north married someone from the south, either meeting in the south prior to going west or meeting somewhere along the way to the left coast. We have had many posts with the western movement theme. But, computing has always been implied.

Our focus goes beyond the computing part of technology, as we are interested in significant contributions to the world's knowledge along the way. Example: Charles Sanders Peirce (see Gardner's Beacon, XII, 3). Additionally, good old English thoughts come into play as well. Example: Genealogy and Bayes. A common theme has been following New England families as they moved west: St. Louis MO to San Francisco CA (before the Civil War); KATY – western railroad; even, Ipswich, founder of Ohio.

Technology, computing

We heard of ChatGPT from a colleague who was remarking about the responses to the release, two months after the fact. At the time, we had been involved with meeting several deadlines and did not pay attention to what seemed to be a sidetrack. In retrospect, OpenAI's move got immediate notice and resulted in the usual three types of reactions. Technology lovers took off and began to show how this software represented the future. Others saw immediate doom. Turns out that both were right which we will discuss. The third reaction is the "who cares?" type which was not wrong.

Except, we might have seen the largest blunder in the history of the U.S. Again, that is an issue to discuss. Our first use of the system was reported on the 2nd of February.. There are several techniques involved with this approach which we will name as xNN/LLM. We use xNN, as it is an example of the work in neural nets that come from the 1950s and before. The many modes of work seen over the decades will be reviewed as there are many situations to scrutinize. At the same time, the approach brought to bear improvements in handling language which is older than the hills using the large language model (LLM). This technique provides a natural looking interface, but it is an empty promise. There is no understanding involved. We have seen reactions along a wide range, including the claims of having experienced sentience on the part of the system. That got wide attention in the media. Another problem deals with "fakery" as a norm. The output is made interesting, supposedly, through introduction of probability into a mechanism that reads, relates, builds a model, and then pulls words by known sequence. As our intent is to fully describe the various pieces of the algorithmic marvel, we will address issues further.

Technology, issues

We must note, that some of the mathematics is very sophisticated, at the same time pointing out that a lot of the work is more than a century old and was done before we tamed matter in the 20th century in ways that are both good and not so good. Not so good? The "Oppenheimer" movie features James Bryant Conant. On reading an article about him, we were motivated to look at Harvard Presidents and their New England connections.

This is merely introductory as none of the related topics are trivial. Computing might seem easy when implemented well, but there is no application seen to date that does not have underlying issues. Somewhat, one might say, these represent unresolved problems. Will lessons learned over the long 400 years of the US if given proper attention help us to grapple with increasingly complicated situations such as those presented by modern computer models?

In the 1980s, Sperry Univac established its Knowledge Systems Center for the purpose of developing "expert systems" that were based upon knowledge obtained from experts. xNN/LLM represents a complementary approach. We will discuss how the older kin which has received little notice over the years will contribute to current dilemmas. Expert systems have been in use, for the past few decades. These are stories awaiting attention whose time is now.

With respect to the Sperry KSC, our portal provides access to an introductory article by Larry L. Walker who was the Director of the KSC. Expect more discussion along this line.

Sperry Univac Pioneers Application of Artificial Intelligence – 1985-1987 (PDF, blog post).