A DISCUSSION ABOUT RESEARCH

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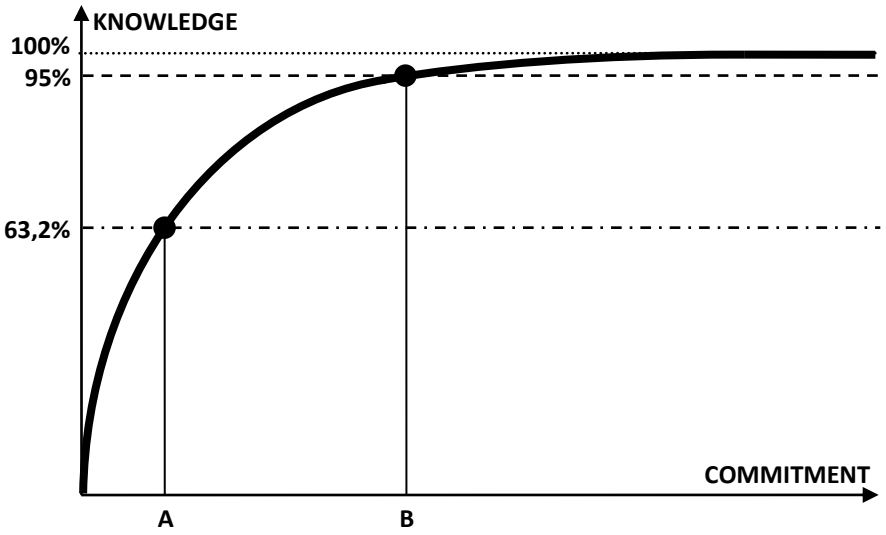
This article evolved from another I had previously written in March 2011 for a conference I held in Bologna on the subject of "Research and private citizens", and is aimed at answering the question: *Can an individual or small group of people do research work under significant budgetary restrictions and still achieve important results?*
Obviously the planning and construction of a huge particle accelerator such as the LHC (Large Hadron Collider) in Geneva requires vast financial resources, greater than the GDP (Gross Domestic Product) of some developing nations. While the purpose of such a construction may be debatable it is nonetheless intellectually challenging.
Less intellectually appealing, but still of great technological importance, are for example the planning and construction of aircraft, missiles, or warships, and these evidently require large financial resources (almost always from taxpayers).
Research in universities is often very intellectually attractive but also needs significant investment, which in some countries comes mainly through public funding for basic research or from private companies for applied research.

Research is a challenge to the unknown, a conquest of knowledge, an aid to humanity and draws many to it but, as the media constantly remind us, it seems to always be hungry for enormous amounts of money, way beyond the means of individuals or small companies. This discourages most from entering the field and for others within the field can lead to flawed planning and implementation. I will now explain why this is so.

Can someone still carry out research work if he/she is sufficiently educated and capable, not employed by any large research centre, not part of the academic world and therefore with no access to any real funding (unless from a wealthy family)?
The "discouragement" comes from the fact that to these people any possibility of work in research and of contributing to human knowledge seems to be undeservedly blocked, because only a few – not always deservedly – have access to the necessary funding.

As I said, the media appreciably worsen the situation by continually hammering us with requests for public funding on behalf of this or that organization, and lead us to believe that without the wealthy *deus ex machina* it's impossible to do anything acceptable. Hence the flawed planning and implementation.
As far as Big Research is concerned, they're undoubtedly correct - nothing happens without huge sums of cash - but this is NOT the whole truth. There's more to the story and here a brief digression is required.

The figure below is a well-known diagram that shows the relationship between the level of knowledge acquired for any subject needing some form of commitment (time, money, people, etc) and the commitment necessary to achieve that level. The exponential curve is always approaching a maximum value (asymptote) that it never reaches.



This type of curve also represents the tendency of many natural events, and therefore the function used to calculate it is called the “natural logarithm”.
The line indicating 63.2% of the maximum is a particularly important part of the curve (1-1/e), defined by “e” (base e = 2.718281828...), which requires commitment **A**.
To reach 95% of the maximum a much larger commitment **B** is required.
To reach the maximum, however, no amount of commitment is enough.

The biggest mistake is in thinking that research is only worthy of the name when it is past point **A**. Usually academic research sits between **A** and **B** (we’ll see why later) and Big Research past point **B**.
This mistake is also compounded by another common flawed belief: overrating the importance of equipment. This is similar to a sedentary person - suddenly learning of the importance of exercise - rushing out and buying a top of the line pro bicycle (such as those used by Tour de France riders) with equally state-of-the-art shoes and attire, only to realize once in the saddle that cycling is hard work and that expensive gear makes no difference without the requisite training. In other words, the best equipment in the world is no match for excess weight and untrained muscles. Similarly many convince themselves, often from arrogance and apathy, that research is not possible without heavy funding, so don’t even consider taking steps in that direction.

A little known but excellent example of this is amateur astronomers.
Professional astronomers have access to space telescopes and the latest terrestrial telescopes of massive proportions, as well as smaller and older instruments, all of which allow them to do a lot, but not everything; in fact they’re relatively few in number and astronomical observations require lots of time and equipment. Therefore amateur astronomers around the world do much of the basic stuff that astronomers are either unable to do themselves or don’t want to do because it’s taxing and does not further their careers. The amateurs use smaller and cheaper telescopes, sometimes even portable ones, but regularly and constantly scan the skies. If one of them is out of action due to either commitments or bad weather, there are always others who can take over with a minimum of fuss because there are many of them and they do it for pleasure rather than duty. Obviously they can’t do a spectral analysis of a quasar 10 billion light years away or discover extrasolar planets, but they can adequately monitor the sky, often having newly-discovered comets named after them, and they regularly spot asteroids and other unusual celestial phenomena. In practice they reach point **A** on the curve, after which the professionals take over with their instrumental analyses and publish their results, thus reaching point **B**. To pass point **B**,

for example by launching a probe to study a comet, more powerful organizations (eg NASA, ESA, etc) and large financial investments are required.
The amateur astronomer example is clear: passion and forethought are essential. Passion allows one to work hard but not stressfully. Forethought assists in deciding what is realistically possible to achieve without frustrating disappointments; the greatest reward for an amateur astronomer is to have a comet or asteroid named after him/her.

For an individual or an entity composed of a small number of people with limited resources it is unrealistic to expect to the same level of performance as a large research centre or a university – appropriate equipment, suitable space, and often specialists in certain fields are all lacking. Therefore there is no point in drafting weighty protocols to cover oneself from potential criticisms by skeptics because they can always say, as a typical example (and not as absurd as it first seems): *For this experiment you didn't use equipment X* (very expensive), *and furthermore it wasn't done in an appropriate setting which must be an anechoic chamber, a broad-spectrum Faraday cage and a perfect magnetic shield all at the same time* (where to find such a thing? Most likely the military, but they won't make it available. And even if it could be found, how much would it cost to use?). *Consequently the work you've done is not scientifically valid*.

As I often say, any general worth his salt knows very well that confronting an enemy on his home turf is a fatal error and so must develop an appropriate strategy to take advantage of the enemy's weak point, for example not using a regular army in battle which the enemy is prepared for. From this come guerilla tactics and something like this is used by individual researchers and small organizations, even though there's no actual enemy to confront, only a powerful adversary that has been persuading them that its own methods are the only right and acceptable ones, that more and more money is needed (that only it can access) and that it is the only one with the truth. NOT TRUE.
I've been saying for years that an open mind and intelligence – something the adversary doesn't always possess – as well as flexibility are necessary, which an official organization (often bureaucratic) has only in limited amounts.

With respect to official organizations and research in universities, it's important to note that the academic world is self-referential and tends to exclude anything (people, ideas and results) that doesn't originate from within itself. In regard to this let's look at so-called "peer review"[*]", which is touted as an incontrovertible guarantee of quality, but is only so for non-fundamental developments in already well-consolidated fields where there are renown experts sitting as judges. These same experts are NOT necessarily the best judges, and are generally already hostile, in cases of REAL and crucial discoveries that could possibly turn a subject upside down or even create a new branch of research.

Here is an example: if we were to ask a Nobel Laureate in Physics an opinion on the development of the Fukushima nuclear disaster, it would be justifiably considered qualified and appropriate. However, if we were to ask this person for an opinion on the latest pre-Incan archaeological

[*] *Peer review consists of the following: whenever there is something new to report from the academic research field, an article about it is sent – in English as per standard procedure – to one of the journals that count; that is, a journal considered so important that whatever it publishes is taken very seriously. The journal's editorial staff chooses two or three researchers who are deemed experts in the subject (referees) and tasks them with reading and (anonymously) judging the article, which is then subjected to a revision by the editorial staff. If it passes all these obstacles the article is published and the content considered to be, to all intents and purposes, likely true, and becomes part of that subject's literature.*

discovery, then we would NOT deem it qualified and would in principle consider an Egyptologist's opinion more reliable who, although not a specialist in the pre-Incan world, is at least in the same field. This is the reasoning followed by editors of journals *that count* (more and more often online) when they receive a REAL development that nobody has come across before: they choose reviewers who, in their opinion, are more or less in the same field and ask them to give an anonymous judgement about it.
But they don't take into account the fact that an Egyptologist, although an expert at reading hieroglyphs, could well be quite ignorant of Andean archaeology and also hostile to revolutionary discoveries. His/her anonymous negative judgement could in reality be unreliable, but would still be considered valid and the article not published despite its author being an academic and its content of great importance.
This problem was identified a while back and has provoked heated reactions by researchers, so much so that new online journals have been created that, when presented with a new article, only examine methodology, and if there are no objections the article is then published. Reviewers are invited to comment publicly and authors can reply to comments, also publicly, spawning an open debate. Examples of these are *F1000Research* (http://f1000research.com) and *The WINNOWER* (https://thewinnower.com).
The worst case scenario is if the author is not in some way connected to the academic world; his/her article in all probability would not even be considered, and to enter academia, especially in Italy, is very difficult and not truly based on merit.

It is important to note that academic research ends up in scientific publications and the results are only given space if positive.
There is therefore interest in unofficial research which produces innovative and repeatable results because academic research draws from it to prepare protocols with a low risk of failure and that guarantee results with a minimal expenditure of time and money, as well as the opportunity to do more publishable research for the same cost.

Unofficial research however is not always known about because it does not have access to journals *that count* and often is not even published in lesser known journals. The latter in fact are not necessarily of a higher intellectual standard and sometimes research is copied and published as original by those wishing to promote themselves.
To protect themselves, those involved in unofficial research must almost always work in secret and remain virtually invisible to academics, therefore personal acquaintances form the link between non-academic and academic research (point **A** on the curve).
This is exactly what happened in our case, which lead to a fruitful collaboration between the University of Padova and our private research organization (EvanLab).

The connection between academic research and Big Research (point **B** on the curve) is, instead, *automatic*, because if a new discovery is pertinent to scientific, military or industrial advancement, there's no need to advertise it given that it has obviously been published and is well-known.

When it comes to a frontier field as opposed by officialdom as the scientific study of parapsychology, individuals and small organizations can be as useful as amateur astronomers: they work at the grassroots level, reaching point **A** on the curve. In practice this means discovering the existence of a phenomenon and identifying a suitable method for studying it.

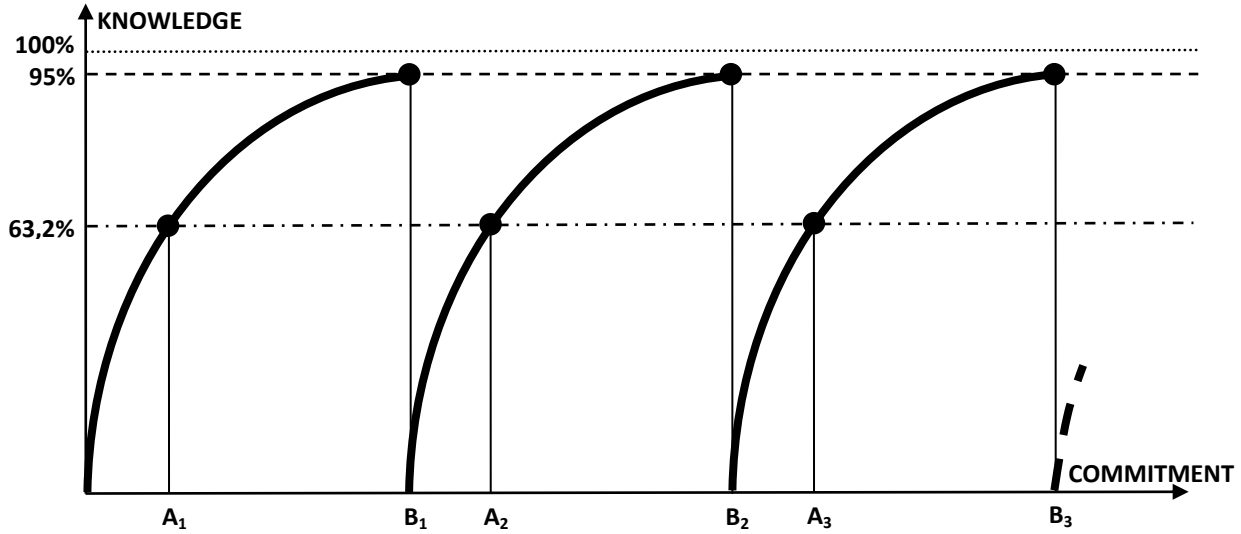
If we approach individuals who may be gifted with unusual abilities as private citizens rather than official organizations, we can develop an informal and closer relationship with them. This requires

time and empathy – something official organizations rarely possess – but we can privately participate in phenomena that official investigation could never hope to do.
A large amount of data collected privately by using basic low-cost equipment, provided such data are accurately and patiently recorded, allows us to gather statistically significant records pertaining to the characteristics of gifted subjects and the types of anomalous phenomena they are capable of.

It's not a new concept and it works well; in fact it was used by ancient Indian and Chinese doctors to develop their diagnostic and therapeutic disciplines. They observed and noted with great attention everything the patient presented with, and in time associated each symptom with a treatment, continuing to confirm their observations without prejudice.
Although the data are not collected using equipment or according to official procedures, they can nonetheless assist us in identifying phenomena and people of particular interest. We can then proceed to work officially with these people, yet still inexpensively, to help then better develop their abilities.

At this point the ball is in the academics' court, some of whom may be tempted by the possibility of vaunting the results – *scientific* this time – now available thanks to the grassroots work done by the private peons. The only way the latter can protect the intellectual property rights of their discoveries is through official publication, but the journals *that count* will only publish work by academics, signed by them and sometimes with the added names of the peons.

This is an unpleasant aspect of our society, but not a true limitation, because a private citizen who wants to do research usually does it for a love of knowledge and at own expense.
But a private individual can achieve much more in the long run.
If it's true that, once point **A** has been reached without much concern over the official nature of the methods used, and going further requires bringing in other more powerful people, be it financial or organizational, it's also true that from this collaboration the private individual can then use the knowledge acquired from these others to reach point **B**. After then proving his innovative abilities, either on his own or with like-minded others, further research can be initiated to once again reach point **A** on a new curve. Applying this principle, each time **B** is reached on one curve, i.e. in one area, it's no longer worth persisting and it's best to begin another curve, i.e. another area, until **A** is once again reached as an individual and then **B** through others (see figure below).



The principle is simple: by becoming an expert in different disciplines, the overall proficiency improves and becomes rarer as the number of disciplines increases.
At this point what was considered a limitation for the private individual – the peon of science – becomes his strong point, because one who was able to reach point **B** in many curves won't be afraid of the next discipline. On the contrary, a new world of knowledge will open up which is unavailable to those who have only ever worked within a single curve, even if they managed to pass point **B**. This individual will have acquired a sufficiently open mind to be able to see what others can't and to then begin the study of it.
Applying these concepts to EvanLab's research team:
We have reached point **A** with much care and little work, having repeatedly noticed the effects of human emotions on electronic devices.
We are now working to reach point **B**, requiring a much greater effort, to produce and publish scientific proof for our interaction between mind and matter project (See, in Articles section, **INTERACTION BETWEEN MIND AND MATTER**).
To go beyond point **B** is outside our scope and at this level electronic devices for common use (eg those that can be used in smartphones) and sensitive to human intentions can be developed and produced for communication without the need for EM radiation.
We can then proceed from mind to matter interaction and begin theorizing about the interaction between minds, which we are currently working on aiming to also reach point **B** (See, in Articles section, **MIND TO MIND INTERACTION AT A DISTANCE**).
Furthermore, if the human mind is capable of influencing matter and other minds, it leads us to wonder if it is situated *inside* or *outside* the physical body. This is another interesting subject to study and from this we developed out project on the bidirectional (two-way) control of an OBE (Out of Body Experience) while under hypnosis (See, in Articles section, **BIDIRECTIONAL CONTROL OF AN HYPNOTICALLY-INDUCED OBE**).
There are other fields in which we have reached point **A**, but due to money, time, and available people constraints we are for the moment concentrating our efforts on those mentioned above.