Can Adam Smith's Invisible Hand phenomenon be used for the analysis of Fourth Estate's impact and behavior?

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***Abstract*—Paper presents research conducted in order to understand why neural networks from Evolution point of view are developing in such a strange way. When observing development of species, development of consistent neural network is always stopped on certain level and is continued as development of distributed, cooperating neural networks. Such networks are organized into social structures. Adam Smith's Invisible Hand (ASIH) phenomena emerges here as key factor to understand this. ASIH is perceived here as meta-computational process on platform of local neural networks, hosted by agents. ASIH theoretically is able to provide self-regulation for social structures, better than any centralized structure (dictator, government, authority) can do. Contrary to deterministic computational processes in today's digital computers, the computational processes that are behind Invisible Hand are: unconscious, nondeterministic, multithread, chaotic and non-continuous. This research methodology has provided astonishing results:**

- **Understanding of Elementary Invisible Hand, which is ruling so efficiently anthill. On this basis Artificial Invisible Hand can be derived to provide self-control of teams of AI mobile robots for situations when human-supervisor cannot assist them or management is too complicated;**
- **Invisible Hand applied to problem of understanding the Fourth (4th) Estate allowed, for the first time, to point to very clear, well visible real (not abstract) case of Invisible Hand;**
- **The 4th Estate on the platform of modern electronic media (MEM) emerges as a new worldwide governing superpower.**

***Index Terms*—Evolution of neural networks, Adam Smith's Invisible Hand (ASIH), Fourth (4th) Estate, self-regulation, meta-computational process, modern electronic media (MEM).**

I. Introduction

When analysing on how Evolution is developing neural networks (brains of species) there can be found astonishing lack of continuity.

Ants emerged in the Cretaceous period (145 to 66 million years ago) and diversified after the rise of flowering plants.

Single ant with 250,000 neurons only, is mentally too primitive to act (even as a group) as a ruler in the anthill. Ant queen is only stud. Despite this, anthill displays astonishing Collective Intelligence, even creativeness when adopting to new environments of human cities. Evolution provided ants with Elementary Invisible Hand ruling the anthill so efficiently.

Observing, there is no next step in a single ant neural network development. There are no super-ants with super-brains like in some sci-fi horror movies. The same applies to people: the brain size (volume) of extinct Neanderthals exceeded the one of modern Homo Sapiens.

Homo Sapiens, to colonize all the continents and larger islands, arrived in Eurasia 125,000-60,000 years ago. In human brain there are estimated to be 16,340,000,000 neurons, thus 65,360 times more than ant has. It can be said that human is equivalent of several anthills in terms of neurons.

So, the question may be asked: why the Evolution stopped experimenting with ants and started with the human species? Hypothesis proposed by authors is that:

The real reason was to have Invisible Hand more universal (able to work not only on economy platform) and more powerful (able to control "sets of sets" of social structures).

It can be said, that Evolution has discovered Invisible Hand phenomena long time before Adam Smith managed to do this in 1759 and to apply it to rule systems of autonomous neural networks even so big as present human population[1] is (approx. 7,638,579,800 on 24.03.2020).

Such population of autonomous neural networks is now becoming organized and is communicating on the platform of modern electronic media (MEM), thus must be ruled anyway, e.g. with the help of 4th Estate.

What can Elementary Invisible Hand do ruling anthill, can be decoded [1] on the basis of works of Nobel awarded American economist H. Simon, cooperating in 1959 with J. C. Shaw, and Allen Newell (IT specialists). They, together, have built General Problem Solver (G.P.S.) program [2], a milestone in AI development[2]. H. Simon was specialist in *Organizational Economic*. They have used there Means-Ends-Analysis (MEA)

[1]Source: U.S. and World Population Clock https://www.census.gov/popclock/

[2]For this they became ACM A.M. Turing Award laureates - equivalent of Nobel Award in IT.

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[3] and predicate logic (Horn clause) to express problem which G.P.S. was supposed to solve.
Today G.P.S. program will be considered as very obsolete by some, however if:

- Logic (predicate logic suitable for humans to describe problem) will be replaced by inference in shape grammars [4] (much more suitable for primitive ants to describe problem they should solve). Paper [5] demonstrates how artificial neural network (ANN) can synthesize displacements (even overcoming obstacles) of 6-legged, insect-like robot. What such ANN synthesizes, can be easily formally described with the help of shape grammar inferences, describing sequence of robot poses when walking;
- Instead of single processor used to host G.P.S. (what on advent of AI was obvious), here multiple independent processors will be used, analysing, as a social structure, in the same time the same problem.

then methodology used by G.P.S. allowing e.g. to decode social algorithm [6], [1] on how spontaneously, without prior planning and authority controlling the construction process, social structure of ants is able to build bridge structures with the use of their shells/bodies. Such bridge provides higher level of supply routes optimization, thus optimization of anthill economy (welfare). There is anthill economy - if we take into account origin of term economy: from Greek "household" and "manage". There is very well visible *common good* (welfare) there.

More interesting research results in terms of theoretical research emerges when present knowledge about Invisible Hand [7], [8] is applied to the problem of 4th Estate.

Basic reason is, that Invisible Hand on economy platform is masked by at least four layers:

- Commodity layer,
- Organizational layer,
- Financial layer,
- Social layer.

Opponents of Invisible Hand e.g. [11] always can attribute certain sub-phenomena to above listed four aspects of economy, thus Invisible Hand this way is very dissolved in four such thinners. A. Smith, F. Hayek [9] and H. Simon [10] were able to see through social layer, financial layer and organizational layer respectively, thus Invisible Hand for them was much better visible (with the help of their extraordinary minds). Moreover, A. Smith was observing Invisible Hand on area of then British economy and F. Hayek and H. Simon on area of US economy - the best economies around the World at that time.

The situation is changing rapidly when looking at Invisible Hand in case of 4th Estate. Financial layer was send to back, commodity layer has now form of processing and transfer of information on the MEN platform, chaos is dominating the organizational layer and social layer simply does not exist on present development stage of MEN .

Thus Invisible Had is much better/easier visible, what confirms example given in section IV.

II. Adam Smith's Invisible Hand and 4TH Estate

While "power" in the classical sense has been the tradition for thousands of years, "power" on the economic platform did not begin to show its paradoxical behaviour (the phenomenon of the Invisible Hand) in Adam Smith's era. At that time, a relatively democratic Britain was the complete opposite of the many totalitarian European systems built by such outstanding personalities as Frederick the Great of Prussia (1712-1786), Tsarina Catherine the Great (1729-1796) and finally Napoleon Bonaparte (1769-1821). At that time, Britain operations were based on trade[3] in huge areas extending as far as India (implying a delay in providing information) and based on the rapid development of the metallurgical and textile industries (with the associated unpredictability of technical progress and the industrial revolution). The economy, and trade related to such conditions, were completely unsuitable for "centralistic and totalitarian management". Only a company (manufacturer, trading company) and stock market investors could be the decision-making unit. Therefore, self-steering of social and economic structures had to be spontaneously implemented. Adam Smith noticed[4] this phenomenon in 1759. Despite the apparent chaos[5] resulting from the functioning of such a system, Britain was quickly becoming a powerful economic/commercial/military empire. The Napoleonic wars ultimately showed the strength of Britain's system.

In a sense, we have a similar situation regarding the 4th Estate. The power of the media was noticed[6] simultaneously with the phenomenon of the Invisible Hand, as early as 1787 on the platform of the English parliament - the House of Commons. In 1891 Oscar Wilde wrote *"We are dominated by Journalism"*[7]. The phenomenon of the 4th Estate authorities could be revealed in London at the parliamentary level due to the incredible concentration in a relatively small area (in today's understanding) of the legislative, judicial, executive and power of the then-British newspapers based on the intellectual power of the British elite. Nevertheless, the media platform at the time was microscopic compared to the economic platform and limited to liberal Britain.

It is only today, with the existence of readily available electronic media that the stock market value of companies

[3]Presumably the ancient Phoenician Republic of Cartagena, and then the Renaissance Venetian Republic were too small to make this phenomenon visible.

[4]Some researchers question whether Adam Smith was aware of what he said, because the phrase "Invisible Hand" was used by him only three times and there are no studies that would indicate that he actually worked on this issue. However, from the point of view of T. Szuba's work on the chaotic processes of Collective Intelligence [13], this is completely irrelevant. It is important that as a prominent and respected thinker, philosopher and economist, he created this concept, it was not forgotten and other economists around 1925 began to work intensively on it [11]. Christopher Columbus also was not aware that he discovered America.

[5]Chaos it is not the same as indeterminism. Behind Chaos can be hidden e.g. equations. See https://plato.stanford.edu/entries/chaos/#BriHisCha

[6]The author of the concept is considered Edmund Burke - a member of parliament (also considered a philosopher).

[7]Full text is available at https://en.wikisource.org/wiki/The_Soul_of_Man_Under_Socialism.

operating on the media market begins to exceed [12] the value of industrial and commercial companies.

In addition, today the media has become global and none of the states, not even China or Putin's Russia are able to completely "separate medially" from the rest of the world, despite the fact that such efforts are made constantly. The latest initiative by Elon Musk regarding the introduction of the Starlink, global satellite Internet[8], shows that no totalitarian system will be able to separate its inhabitants from global media. While the problem of Adam Smith's Invisible Hand has officially been unresolved since 1759, – [does ASIH exist and function (optimizing e.g. the free market), or is it a harmful myth? [11]] according to supporters of economic interventionism, the issue of the 4th Estate is even more "terra incognita."

However, recently there has been a sharp increase in interest in this phenomenon. Available literature on 4thh Estate has a journalistic style not a scientific one and clearly demonstrates how dispersed this interest is - there is no proverbial "focusing interest".

Book [16] is an exception because it is derived from J. Schultz doctoral thesis. The greatest problem with this publication is, that as a platform 4th Estate activity of Australia is considered. This, to some kind resembles laboratory dish (homogeneous from cultural, economic, organizational, etc. social structure), separated from the rest of the world, similarly like London in 1787 was. Despite this, it is really very important publication, e.g. providing examples of contemporary interaction between 4th Estate and Legislative (1st), Executive (2nd), Judicial (3rd) Estates. Moreover, in 1998 technical level of modern electronic media was restricted to printed media, television, cinema, radio and Internet accessible through "not mobile" devices like PC computer. Today all this is available globally "in one hand" on smartphones media platform.

Therefore, presenting even a simplified model of the 4th Estate functioning would have great importance on many levels (social, economic, political, media theory, media economy, etc.):

- It would increase interest in the topic and intensify research (using an alternative scientific approach);
- It would make it possible to understand the phenomenon, even to control adverse hate-like behaviours. Remember Collective Intelligence - we can consider the 4th Estate as such – it does not necessarily show only positive aspects;
- Understanding the essence of the 4th Estate would allow us to obtain the 4th Estate engineering, which is necessary when, for example, some countries use the media, e.g. to influence election results in other countries, to manipulate social spirit in other countries, e.g. dislike of the European Union etc.

[8]Starlink: https://en.wikipedia.org/wiki/Starlink_(satellite_constellation)

III. Social structure of autonomous neural networks as computational process

The simplest demonstration that social structure, if properly organized, can display surprisingly high computational power and flexibility, is the ability of anthill to perform multi-algorithm calculations which are necessary to optimize food supply routes.

Bridge built by ants with the use of their bodies, e.g. Fig. 1 is in fact the final product of two quite different algorithms.

Fig. 1. Simple bridge structure (truss) built with the use of ants bodies. Source https://www.newsweek.com/.

Such bridges provide the anthill with a higher level of path planning optimization between food deposit and the anthill.

At first social structure of ants takes organizational form proper to implement *blind random search algorithm*, to find one or more food deposit(s) and to find shortest path to anthill for every such deposit. Good example of such algorithm can be found in https://mathworld.wolfram.com/AntColonyAlgorithm.html.

Astonishing is fact that this algorithm is:

- *Conflict-free* in case when more than one food deposit will be found, and problem emerges on how to delegate given number of ants to work with given food deposit;
- Is *authority-free* regarding decision about optimal transportation route.

Next, given group of ants working on given transportation route should analyse if the bridge is feasible. It is necessary to take into account, that bridge can be "socially expensive" because ants locked within the bridge truss will not participate in the transportation effort.

Ants' bridge building social algorithm is incomparably more complex and intelligent than human algorithms, related to bridges localization, construction & reconstruction and maintenance. To the authors, not known is a "bridge CAD/CAM system" which incorporates "all-in-one", i.e.:

1) Artificial Intelligence which on the given *site plan* will find where bridges should be located;

2) Will propose general architecture of bridge truss (e.g. if it is arch bridge);
3) Will provide strength calculations for assumed bridge truss;
4) Bridge assembly plan (e.g. Gantt chart) will be proposed;
5) Real time bridge truss adoption (strengthening or reducing) depending on the present load will be done;
6) Replacement of "mechanically tired" elements of the truss will be performed;
7) Bridge disassembly (recovery of items) when bridge is no longer necessary will take place.

The computational process behind "the ants bridge building social algorithm" can be identified and simulated [1].

For analysis and simulations, very simple model of abstract ant has been used as given in Fig. 2.

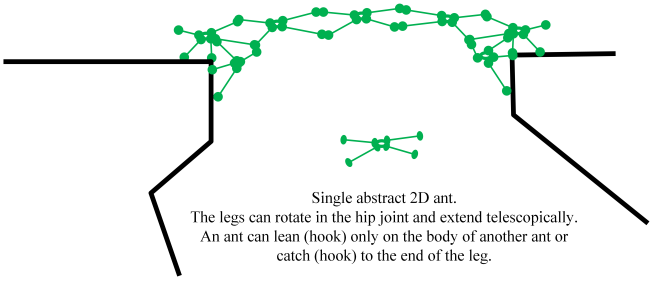

Fig. 2. 2D abstract ants used for algorithm analysis.

Furthermore, Invisible Hand Engineering as a new discipline can be proposed[9] on this basis.

This social algorithm can be hosted by primitive brains of ants (or future AI bridge-span-robots) and has two basic layers:

1) A layer where single computational elements exist (alive) of the bridge truss. It has to perform:
   - Processing tension data;
   - Locally, individual alive elements improve his poses to optimize distribution of forces on the level of legs and bodies;
   - Element has to signal its present state (e.g. over-loaded) and to receive e.g. pheromone (or acoustic) signals from other alive construction elements in the bridge truss. Fig. 3 explains this.
2) A layer, which presents computational elements engaged in a social way into truss construction and maintenance process. Such elements (ants) are observing the truss and look what they can do. Basic strategy for them is to find difference in terms of MEA (Means-Ends-Analysis) and to take action to remove it.

Due to limit of pages, only fundamental components of this algorithm are presented:

- Every difference type is attributed by priority. The difference symbolizing an overloaded ant mounted in the bridge truss, has the highest priority;

Egoism of a single ant, which does not want to be overloaded, is compensated by the willingness of other ants to cooperate. It is the fundamental axiom of the Invisible Hand philosophy. Here it perfectly fits the needs of this algorithm, because an egoistic ant can signal in advance that it is overloaded or tired, when symptoms reach the level of e.g. 30% of maximum allowed. From an engineering point of view it is a perfect implementation of a security factor;

- For every bridge built, a dangerous scenario is the one, where a hidden and neglected element fails due to rust, material fatigue etc., thus exposing the entire structure to catastrophic failure. It is therefore reasonable to assume that, much like an ant leaving a truss to rest and eat, a bridge element is being preventatively replaced and maintenance is executed. In terms of MEA, removing this difference (tired ant) has lower priority, than the previous one presented (being overloaded);
- Finally, when there are no more differences to be removed in terms of MEA, the last difference is to advance bridge truss construction (reduce gap between left and right parts of unfinished bridge).

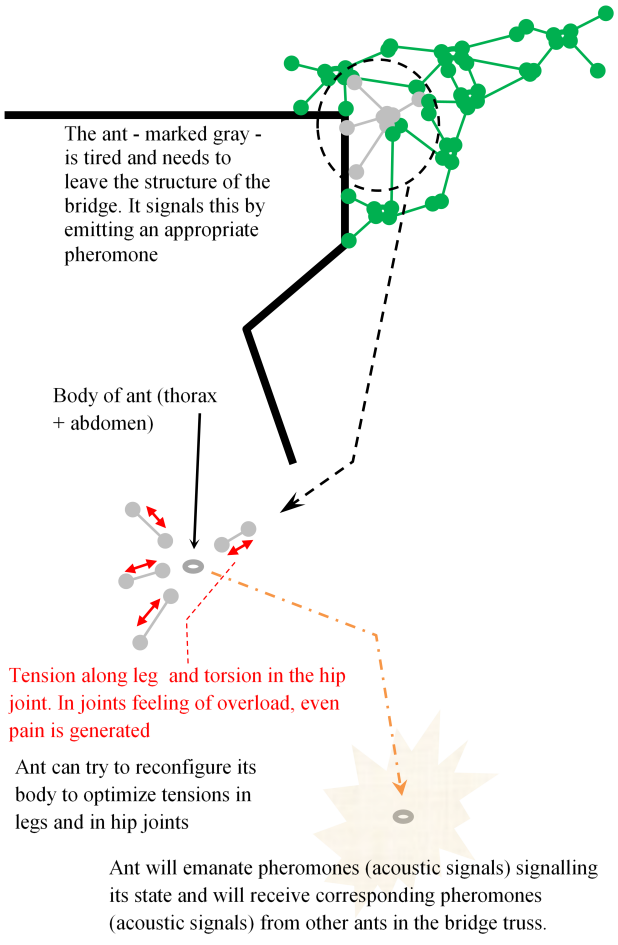

Fig. 3. Basic (single agent-ant) flow of information in social sub-structure of ants which have built bridge with the use of their bodies.

[9]Author is engaged in research project: "Robotized, collective intelligent, self-assembling bridge for civil and military applications"

IV. Proof of Existence of the Invisible Hand on the Platform of Modern Media

In 1974, a prominent American philosopher Robert Nozick (1938-2002) provided the famous and amazingly simple example of the Invisible Hand [14], [15] on the platform of an abstract social structure/market.

Let's assume that there exists a social structure of intelligent and perceptive agents, that functions without any form of government/authority – they are simply self-governing. This social structure does "business as usual.

Let's now assume that for some reason(s), some agents have stopped acting "morally" [14], whatever it may mean. The reason can be e.g. active questioning moral principle(s), technological discovery, etc. allowing to gain undeserved profit at the expense of other agents.

R. Nozick claims, that in the absence of authority to solve this problem, some other agents in response, will discover a chance for fair deal and will start to offer a free market product - "security packages" [14], this way gaining profit on the basis of other agents behaving "immorally".

This way according to Nozick, a so called "minimal state" will emerge. If such "security packages" remain a free market product, we cannot claim that a government/authority has emerged.

Authors of this paper believe that something like this had in fact happened (1971-1972) on the technological platform of recently born modern media. It seems that to-date, nobody has realized this, nor publicized this confirmation of Nozick's theory.

The possible reason that this observation wasn't made, is that aside from research on the Invisible Hand (Nozick's theory), it was necessary to take into account the problem of the 4th Estate as well as having knowledge about IT, computer science and simply, the Internet.

In the case of a modern media platform, let's analyse what can happen if some users act "immorally":

- Some will argue that there already exist three Estates and that they are responsible enough and authorized to react to this immorality.
  The emergence of a new platform and related technology always generates a chance for a new type of crime not yet defined in the Penal Codes. The duty of 1st Estate (legislative power) is to be the first to take action. After this, 2nd and 3rd Estates will be entitled to act to stop agents who act "immorally". It will require a long time, because a sufficient set of cases of this type of crime must be documented, reliable analysis must be done (in parallel to this, specialists will emerge) and finally on this basis, new paragraphs in the Penal Codes will be generated. However, it is not the end - enforcement regulations must be created for the 2nd Estate. We all know that even obvious cases can be subject to parliamentary war(s) and/or become a hostage of parliamentary games;
- Another theoretical option is that on the platform of modern media a local and problem-specific "minimal state" should spontaneously emerge, in terms of R. Nozick. In the early 80-s such process took place and can be documented as given.
  Commercial computer anti-virus systems are a perfect example of such free market product (security packages), responding to emerging social structure/market problems such as in the case of computer malware that affects shipping, banking and even nuclear energy production. In case of the modern media platform, an area of possible activity is the Internet, whereas 1st, 2nd and 3rd Estates remain local, because of nations, borders, conflict of interests of states, cultures, etc. (it is not to say that nations try to control Internet using borders).
  Widely available anti-virus security packages remain commercial, mutually competing products because governments "do their best" to prohibit them from merging into one global product and becoming a monopoly. Recent case of Kaspersky anti-virus security package demonstrates how sensitive issue it is[10].
  Thus, we can claim that "anti-virus security packages" directly correspond to Nozick's abstract "security packages" and in reality, create "minimal state" in terms of R. Nozick example.
  R. Nozick proposed the concept of *minimal state* and *security packages* in 1974, referring to Invisible Hand.
  In 1971 Bob Thomas designed a computer program[11], a prototype of later viruses, called "Creeper worm"[12] .
  This program was not an intentionally malicious software as it caused no damage to data, the only effect was a message it created to the teletype, reading "*I'm the creeper: catch me if you can*".
  Supposedly, the motivation to write this program was to, search out an incompletely shut down computers left by students after class was over.
  This way the author unintentionally opened a "Pandora's box[13]" i.e. provided an idea and technology for computer viruses.
  In 1972 Ray Tomlinson designed[14] a program called the "Reaper" to delete "Creeper worm", which was the first anti-virus software, but also a "security package" in terms of Nozick.
  Surely both authors/programmers were not aware of the future which came.
  The first real computer virus is considered to be the "Elk Cloner", created in 1981 by a high school student, as a joke. The transferring media was a floppy disk infected by this virus, used by several students e.g. to exchange

[10]The United States banned civilian government agencies from using Kaspersky products in September amid mounting concern among U.S. officials that the software could be exploited by Russian spy agencies. Source www.Reuters.com, January 19, 2018 / 12:44 PM

[11]First version was able to move only, next version was also able to self-replicate.

[12]Nice description with all accompanying circumstances can be found here: https://history-computer.com/Internet/Maturing/Thomas.html

[13]https://en.wikipedia.org/wiki/Pandora's_box

[14]https://en.wikipedia.org/wiki/Reaper_(program)

files between computers.

It cannot be said that Nozick was aware and inspired by this example, because at that time, computer science was a very elitist, closed environment. There was neither Internet (first e-mail was sent in 1971) nor PC-computers (IBM PC XT 1983).

This way, the famous Nozick example got practical confirmation and we can claim that the Invisible Hand on the platform of modern media has manifested its existence.

Please note that this example demonstrates a property of Invisible Hand to host "conflicting activities". In case of ants it was egoism vs willingness to cooperate. Two contradictory processes take place: design of computer viruses and design of a tool to remove it. In terms of control theory, it is understandable, there is a design of stimulation and design of corresponding suppression.

V. The 4th Estate as a computational process on the platform of modern electronic media (MEM)

The case of the Invisible Hand given in the previous section clearly demonstrates that the Invisible Hand has spontaneous self-controlling ability, though restricted to a given sub-platform (in this case IT). An outbreak of computer viruses has been stabilized by spontaneous emergence of anti-virus security packages.

The 4th Estate is more powerful than three traditional Estates, because:

- MEM is global in terms of the World, control over them is distributed and it pervades all areas of life. Moreover, it does not depend on age;
- Traditional Estates (legislative, executive, juridical) are dismembered and assigned to nations or to structures like the European Union. Despite the European Union attempting to create substitutes of all three traditional Estates on the EU level, some countries display insubordination[15], even if the relevant treaties were previously signed.

The use of GIS (Geographic Information Systems) description methodology using layers and available simulation software[16] e.g. [18] is proposed for the description and analysis of computational processes, which are behind Invisible Hand and thus the 4th Estate. MEM processes are so heterogeneous, that only the GIS approach can provide a chance to manage the problem. Inter-layer data transfer provides a seamless data conversion opportunity. Let's keep in mind that the structure of digital processor and software pyramid above, we describe also by using concept of layers.

Layers allow us to extract from the global World - perceived from a MEM perspective - the most important classes of actors due to their similarity and to observe and formalize them on a common dedicated layer. Formalization of agents on a given layer is fundamental in order to describe what kind of data processing they perform, in terms of computational processes.

Due to a very high diversity of processes on the MEN platform, two models of computations seem to be dominant:

- Data flow computational model [19] for cases where data processing architecture is clear and deterministic data processing model should be applied;
- Molecular model of computations [20] where data processing is chaotic or even in-deterministic.

Let's now discuss layers proposed by authors.

Layer of 1st Estate (legislative), 2nd Estate (executive) and 3st Estate (judiciary)

In principle, this layer should break up into 3 sub-layers, but due to the "locality" in the sense of the country and very strong interrelationships resulting from the political system, geography, culture, language, etc. they are located on common layer. Thus 4th Estate perceives them from a somewhat higher level. Figure 4 illustrates this situation.

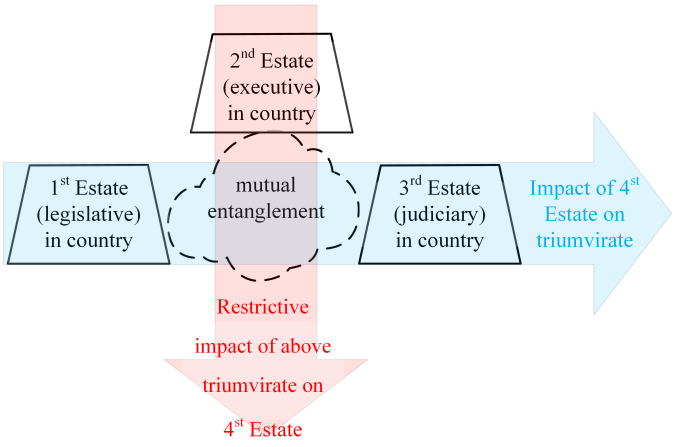

Fig. 4. Three traditional Estates entangled.

Although these three authorities have a rigid framework of functioning (usually constitutional), they are institutions inhabited by people who use, as everyone, both the old (press) as well as MEM. Thus, the following forms of interaction of 1st Estate, 2nd Estate and 3rd Estate with 4th Estate should be expected here:

- Easy and immediate awareness of the state of functioning with the help of MEM, against the background of the same type of Estate in other countries. There is a risk that the information thus obtained will be superficial (because it is easily obtained) or for political purposes information there will be intentionally taken out of context;
- Gaining awareness of new types of crime, legislation for counteracting and its effectiveness in other countries. This is very important, because due to differences in technological advancement, certain pathologies resulting from the nature of MEM may appear in some countries much earlier than in others;

[15]For example recent efforts in Poland to subordinate legislative power and judiciary to executive power. This is against EU treaties.

[16]T. Szuba in the past was using QGIS + MASON + SW Prolog for some Invisible Hand simulations.

- The use of 4th Estate mechanisms for "political games" within the local 1st, 2nd and 3rd Estates;
- Observing the reaction of local public opinion and foreign media to the 1st, 2nd and 3rd Estates activity in a given country, e.g. judicial [16];
- Vice versa, at the 1st, 2nd and 3rd Estates level, there are attempts to influence the 4th Estate, through locally available mechanisms:
  - Passive - such as, for example, anti-podophile activity with respect to internet addresses and servers that are local within the reach of the Executive Authority, activities against the access of pornography by minors, etc.;
  - Active - for example, through "troll farms" paid for by the Executive Authority - both in a negative sense (e.g. an attempt to shape public opinion) and a positive sense (e.g. combating anti-vaccination or disinformation activities).
- **Recent outbreak of coronavirus which took form of global pandemic, is providing fresh data on how interact local 1st, 2nd and 3rd Estates with the 4th Estate. The fight against virus requires drastic social restrictions and social self-discipline, and even martial law. 4th Estate and MEM is becoming in such situation Global Government, however without personality. It simply globally provides information more or less modified by journalists, easy to compare, about governments' actions and resulting situation in countries worldwide. Recent cases of US president and UK Prime Minister clearly demonstrates that no person can contest 4th Estate.**

Human factor layer

It is surprising that by analyzing the 4th Estate we come to the conclusion how important is the "individual man" in the mechanisms of its functioning. For the 4th Estate "individual man" is "kind of a backdoor", through which 4th Estate enters in an unrestrained way and controls e.g. local public institutions, even on parlamentary level.

The description of subsequent layers confirms this observation.

For the purposes of direct analysis of the "human factor" we need 3 layers:

- A layer of passive users of MEM.
  This is the largest group. Such users of MEM use them extensively, this influences their behaviour, e.g. the way they dress, what they buy, even if they participate in street demonstrations, etc., but they themselves do not generate feedback, in the sense that they are silent in the media.

The next layer is divided into two, i.e. the *inspirational layer* and the second layer, where after filtration, some valuable ideas are further processed. The problem of inspiration is a very serious problem. Nobody will say that the genius[17] architect and artist Antonio Gaudi, creator of the Sagrada Familia cathedral in Barcelona "was not creative" - it was quite the opposite. Even genius A. Gaudi was looking for architectural inspirations in the world of nature (e.g. analysing architecture of plants, animal skeletons, etc.), looking for them during his walks.

- Layer of generative users of MEM.
  The term "creative" is deliberately not used here, but the term "generative", just like a random generator of passwords for the Internet, does not deserve the term "creative". The role of the *generative users* is played by users of modern media who post on MEM statements/opinions, provide movies e.g. on YouTube, etc. - on all topics that intrigue, passionate, etc. them. Often, they are completely ignorant of the issue or who will be interested at. Such MEM users generate topics, views, ideas, etc., but do not expect or have time/qualifications/resources to refine and develop the topic in the media. They are simply a *generative layer*. It is important that they do not have "inhibitions", which often block the work of outstanding individuals for fear of its evaluation.
- Influencers[18] and trendsetters[19] layer
  They should be considered as *crème de la crème* in the structure of the 4th Estate, for the following reasons:
  - They are independent and compete with each other;
  - They are the simplest elements filtering MEM and transforming the vastness of media information into a "product";
  - They care about their own profit, so the motives of their business are clear;
  - From the point of view of the theory of Adam Smith's Invisible Hand, they are a spontaneous element that must find a "media theme", then "media clients" and "stay/survive on the market."

  This category also includes "popular journalists" who "hunt for themes" that will attract maximum audience or these topics are "deliberately delivered" to them. The example is the Watergate scandal which is also a demonstration of power of 4th Estate. The anonymous informant has selected two journalists recognized by him as the proper "Watchdog" journalists, guarded by the power of a given medium they represented, here newspapers Washington Post - to fire the scandal.

Layer of modern electronic media platforms

These are platforms such as: Google, Bing, Facebook, Twitter, Snapchat, YouTube, WeChat, etc. This layer should be considered as a supranational transport layer, except that information is transported in huge quantities, not material goods.

The only sensible comparison was the discovery of maritime transport in antiquity. At that time, one 500-ton antique merchant ship (for wheat transport from Egypt to Rome) was carrying the same amount of goods as a caravan of 2,000

[17] Some claim that he was the greatest architect in Human History.

[18] https://dictionary.cambridge.org/pl/dictionary/english/influencer

[19] https://dictionary.cambridge.org/pl/dictionary/english/trendsetter

camels. Today's highways are not as supranational as a sea transport.

That is why today their stock market value is so high as well as their turnover. Business communities invest in profit expectations and create technical layers for their needs, such as e.g. Elon Musk's Starlink[20] satellite network.

A layer of modern electronic media financing

We distinguish the following sources of financing for MEM:

- State (government) sources (e.g. state press and television);
- Large media consortiums based on subscriptions (e.g. electronic newspapers) and advertisements;
- Mass advertisements providers, e.g. some sport associations;
- Large companies investing in technical (hardware) resources (huge servers, fiber optic submarine cables, radio links, etc.) that will ensure profit from use.

VI. Conclusions

Let's provide conclusions which can be derived from present state of our research:

- The Invisible Hand really exists and functions as self-regulative phenomena also on the platform of modern electronic media (MEM) in frames of 4th Estate[21].
  On the present stage of MEM development, an event was found that fits perfectly to Nozick's theoretical example of the Invisible Hand and his concept of *minimal state*;
- Even though more cases are necessary to fully convince fiercest enemies of the Invisible Hand idea, we can claim that after almost 261 years, we managed to provide the first (previously theoretically drafted) example[22] of Invisible Hand activity. Example published in this paper directly points to the case in real history, of Invisible Hand self-regulation activity on the platform where it has emerged.
  It is fascinating that this has also happened on the platform of MEM, not on the platform of economics, where A. Smith has spotted the Invisible Hand so long ago. This confirms another of Nozick's hypothesis; that the Invisible Hand is a universal phenomenon, not restricted to economic/social structures;
- We conclude that the 4th Estate will soon be, most probably a global leading force, because the 1st, 2nd and 3rd Estates are fully[23] restricted by countries' geographic borders. Thus, are highly fragmented, whereas the 4th Estate acts worldwide on the basis of MEM and cannot be predicted possible mechanisms restricting its power in the coming future.
  Recent outbreak of coronavirus will provide excellent data for analysis of 4th Estate, how it functions and how powerful is;
- When working on the theory of the 4th Estate it should be assumed, that the Invisible Hand is a sort of an "engine", encapsulated by present worldwide conditions: economic, social, technological, etc.;
- For further research on the 4th Estate, GIS methodology should be used, combined with some different models of computational processes e.g. molecular model of computations, data flow model, etc. They are driving 4th Estate behavior.

[20] Starlink opis: https://en.wikipedia.org/wiki/SpaceX_Starlink

[21] It should be considered as very young comparing to economy, which started to be mature when money has been discovered by Phoenicians. There is not yet defined a "medial-coin", to code abstract value of information in terms of MEM. Perhaps bitcoin is a prototype.

[22] Two more examples will be soon published in specialized journal.

[23] Some very big countries are trying to impose their law outside their borders.

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