

This text, that pretends to give scientific-mathematical-probabilistic and universal rigorousness to epistemology, is a “very personal” tribute to thinkers of the importance of Carl Menger, Karl Popper, and Friedrich A. Hayek, “very intimate intellectual friends”, that I believe would be very satisfied to consider this work as a continuation of their huge contributions to the methodology of the sciences

**CURVE**  
**Of**  
**HUMAN EVOLUTION**  
**C.H.E.**

**(Continuation)**

By Carlos A. Bondone

## CURVE of HUMAN EVOLUTION

### C.H.E.

#### ABSTRACT

The *curve of human evolution*:

- Gives epistemology mathematical-probabilistic-universal rigorousness.
- Rejects the *invisible hand* and the *prisoner's dilemma* explaining the correlation between individual and collective interests.
- It renders unnecessary the concepts of "*spontaneous order*" and "*disperse knowledge*".
- Gives scientific rigorousness to the process of decisional delegation, and professional rank to the activity of the social representative, considering that the *increase of knowledge* and of the number of *individuals* imply the feasibility of an *increase in individual ignorance*.

# CURVE OF HUMAN EVOLUTION

## C.H.E.

### SUMMARY

The *Curve of Human Evolution* – CHE<sup>(x)</sup> pretends to be an analytic tool to explain the correlation between the evolution of individuals and their societies (species), applicable to all spheres.

With CHE several goals in the sphere of knowledge are attained:

- It will no longer be necessary to resort to concepts such as: the invisible hand, spontaneous order, disperse knowledge, complete-incomplete information, and similar ideas.
- CHE proves that since any knowledge can be measured probabilistically this shows the universal nature of epistemology.
- The existence of a decision theory based on the generation of knowledge in minority environments, apt for decision making, and the ignorance of these when deciding in majority environments, allows us to focus on human evolution from a point of view that is present in the whole of human knowledge. In this manner we are in the presence of a comprehensive theory that includes the attempts to explain in one field of knowledge based on the findings of another (example: Public Choice: explains the political based on economics).
- Human evolution is positively correlated with the validity of the twin freedoms: freedom for the formation of minorities that generate knowledge, and freedom for majorities to make use of this knowledge.
- The curve of human evolution bathes capitalism in humility –twin freedoms-, in so far as it postulates it as the maximizing method of human evolution, not as a virtuous circle with an axiomatic tinge.
- The evolution curve allows us to show that the best path for backward countries is to join globalization enthusiastically
- CHE gives decision making a scientific professional rank: in so far as it establishes that both the increase of knowledge and that of the number of individuals, imply the possibility of an increase in individual ignorance, ergo an increase in the responsibility of the delegate to decide in the name of majorities.

With this new tool you can explain with adequate rigorousness the evolution of the different civilizations, countries and/or cities through time. In this manner, there are no “incomprehensible” comparisons of countries with the same ethnicity and different evolution (the two Koreas); countries with high and similar population density and different evolution (USA vs USSR), countries with low population density and different evolution (Switzerland and Argentina); the Argentina of progress (up to 1930) and that of the later underdevelopment up to our time; etc.

The Curve of Human Evolution confers probabilistic rigorousness on epistemology in the same way probabilistic theory eliminated deterministic strictness from (quantum) physics.

**CURVE**  
**Of**  
**HUMAN EVOLUTION (\*)**  
**C.H.E.**  
**(Continuation)**

(\*) Based on a *Theory of Decision Making* supported by *knowledge and ignorance*:  
[www.carlosbondone.com](http://www.carlosbondone.com)

*Metaphysical terms can be defined by means of empirical terms* (Karl Popper)

*Epistemology is a “general theory of the method of empirical sciences”* (Karl Popper)

*Epistemology is a “general theory of scientific method” with mathematical-probabilistic rigor.* (Carlos Bondone)

*...objective knowledge i.e., objective problems, objective arguments and objective theories... -a knowledge we can place outside ourselves and therefore, can be converted into knowledge that can be “discussed and criticized” – (Karl Popper). With freedom* (Carlos Bondone)

*“... our theory..., is a theory of evolution emerging from problem resolution. The emergence of an evolutionary novelty is explained by the emergence of new problems. Theory considers that all organisms and species are constantly occupied in solving problems...”* (Karl Popper)

*“Progress consists of the few convincing a majority. New visions must appear somewhere before they can become mainstream... it is always starting from a minority that acts differently from the majority that the latter ends up learning to do something better”.* (Friedrich A. Hayek)

**Subjective value and objective knowledge, of which it is a function, are the evolutionary links between the individual and his society.**

*Carlos A. Bondone*

## EPISTEMOLOGICAL-MATHEMATICAL MODEL

Based on the epistemological foundations presented here the *Curve of Human Evolution* (CHE) appears, deduced from *Decision Theory*, based on the fact that man needs action to overcome problems, given his condition of fallibility, which he carries out with his capacity to generate *knowledge* apt for action, arising from specialized minorities and that can be used later, or be plunged into *ignorance* by the representatives of majorities at the time decisions must be made.

The model reached presents *multivariate causal hypothesis*: it presents *human evolution* as a subordinate variable, in so far as it is the result of the interaction of *independent variables*: *knowledge* -positively correlated with the subordinate variable-, and *ignorance* – negatively correlated with the subordinate variable.

Working with *conceptual variables* that become *measurable operational*, allows us to apply mathematical calculus of differentiation and integration, which provides *universal scientific rigor to epistemology*.

The proposed model makes the operational variables proposed measurable, in so far as it considers the knowledge reached, avoiding the problem of considering what is unknown, an epistemological problem always present, with paralyzing effects. I.e., the receptacle that we need to analyze is always limited, not infinite. Nevertheless, it establishes a framework of knowledge that has to be generated, considering the problems that must be solved. In this manner, the *Curve of Human Evolution*, that arises from this work, presents an approach of *qualitative investigation* that will serve as a framework for the *quantitative approach* applied in each unit of investigation, which is in line with the fact that qualification comes first and then quantification.

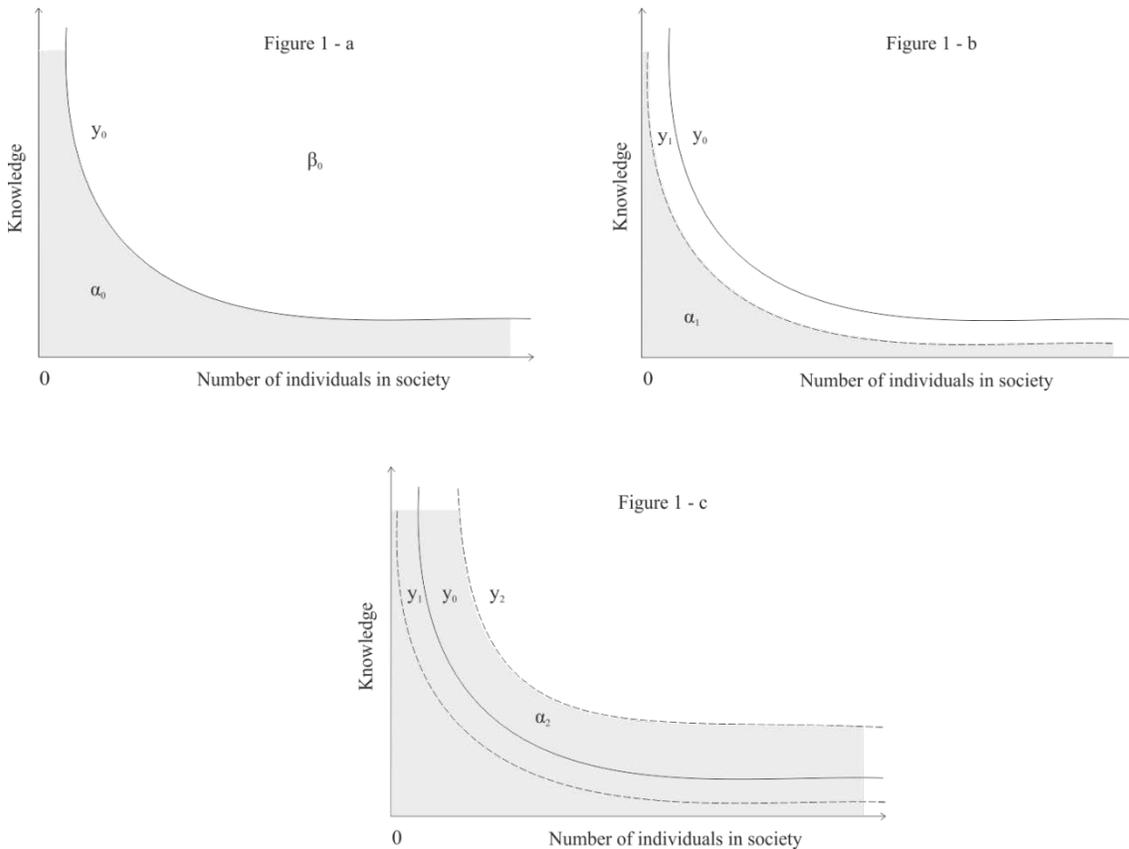
Finally we stress that the *unit of investigation* is human society starting from the individuals that compose it. Considering society as all the spheres of human association (economic, political, academic, cultural, sport, trade-union, corporate, professional, etc.).

## Curve of *KNOWLEDGE*

We can establish a causal relation between the origin of *knowledge applicable to decision making* ( $y$ ) –from here on *knowledge*-, generated in a society, according to its subsets of specialized individuals.

We represent the *curve of knowledge* ( $y$ ) as a variable decreasingly and negatively correlated with the number of individuals that form the society. The knowledge generated in specialized minorities implies a descending slope of knowledge generated as the number of individuals increases.

### Curve of *knowledge*



In figure 1-a) the curve of knowledge we propose is represented by  $y_0$ , which shows a decreasing relation relative to the number of individuals (abscissa) that compose the society where knowledge is generated (ordinate). In this manner we observe a curve with greater generation of knowledge weighted in small groups, that decreases as the number of individuals in the society increases.

This figure must be seen in its two essential aspects, that of the curve generated by the  $y_0$  function, that by definition is a *conduct variable*, and that of the surface that is created under it from the start, which constitutes the *stock* of knowledge that is accumulated according to the increase in the number of individuals that generate knowledge, stock that we will call  $\alpha_0$ . In other words, the curve  $y_0$  is the derivative that explains the incremental manner in which the stock of knowledge ( $\alpha_0$ ) is generated, and the stock of knowledge is the *integral* of the incremental function of knowledge. We can also say that the surface above  $y_0$  is the surface of *fallibility* ( $\beta_0$ ).

Figure 1-b) shows a downward displacement (due to changes in its fundamentals) in the curve of knowledge, which implies a lower level of efficiency ( $y_1 < y_0$ ) in the generation of knowledge at the same level as  $x$ , which explains that with the same amount of individuals a smaller stock of knowledge ( $\alpha_1 < \alpha_0$ ) is generated.

Figure 1-c) shows us the inverse situation, when efficiency in the generation of knowledge is greater, the case of  $y_2$ , you can observe  $y_2 > y_0 > y_{01}$  y  $\alpha_2 > \alpha_0 > \alpha_1$ .

It is important to stress that it is pertinent to have this graphic considering the absolute or percentage values of  $x$ , a situation that will be useful to study the comparative efficiency between different societies and the behavior of a society at different times.

Having established the available stock of knowledge, apt for human decision making in society, and the way it is generated, now we must study the greater or lesser use of this stock.

## Curve of *IGNORANCE*

It is very appropriate to confront the knowledge available with the degree of use of the same. A study that does not imply saying we are studying the glass half full from the point of view of the empty part, an inconsistent situation since we would be in the presence of complementary-dependent variables. In other words, here we study the use of the part of the glass that is full (the *stock* of knowledge), the only datum we have, since we do not even know the size of the “glass”. It is very realistic, adequate and pertinent to stress that each individual that composes society is 99,99% ignorant of the stock of knowledge available for decision making in that community, knowing the 0.01% pertaining to their specialty. *This situation is enhanced with increasing the stock of knowledge and the number of individuals.*

We can establish a causal relation between the use of available knowledge and the knowledge not used when deciding, that we call the *curve of ignorance*. It is important to reiterate the *need* to consider ignorance in the use of available knowledge, since it allows us to quantify based on what we know, and in this manner avoid “studying” based on what is unknown, which would only lead us to desperation.

Knowing that the *ignorance* –of what we know- grows along with the number of individuals, we can draw the following *curve of ignorance*:

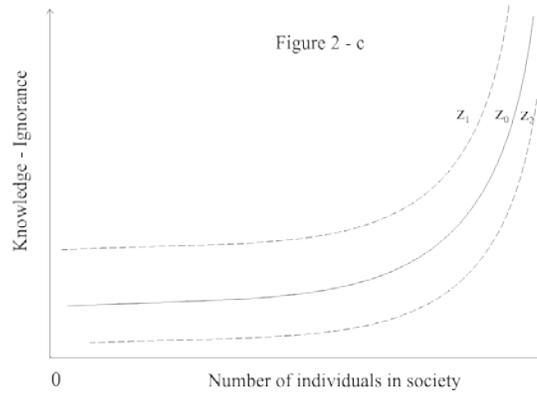
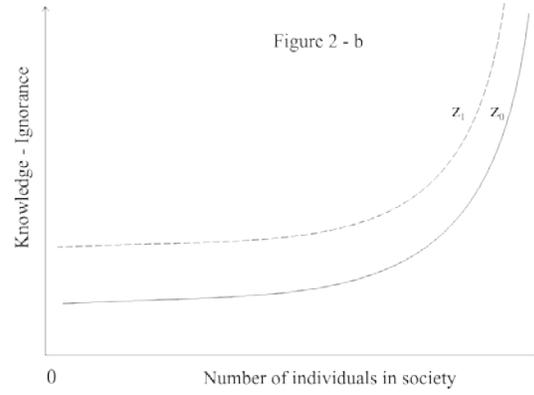
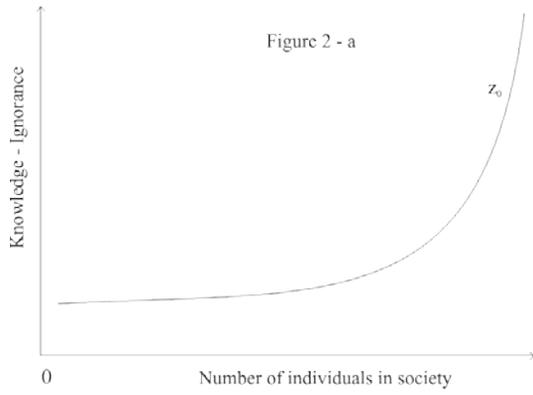
In figure 2-a, the curve of ignorance we propose, represented by  $z_0$ , moves upward as the number of individuals that compose the society increases. As we move to the right the quantities of individuals and of ignorance increase at the same time, i.e., we will have more individuals that are more ignorant of available knowledge.

Figure 2-b shows an upward displacement of the function of ignorance, that indicates that  $z_1 > z_0$ , at the same level as  $x$ , which expresses a greater ignorance with the same number of individuals.

Figure 2-c shows the inverse situation, with a downward displacement of  $z$ , to  $z_2$ , that indicates that  $z_1 > z_0 > z_2$ , at the same level of  $x$ .

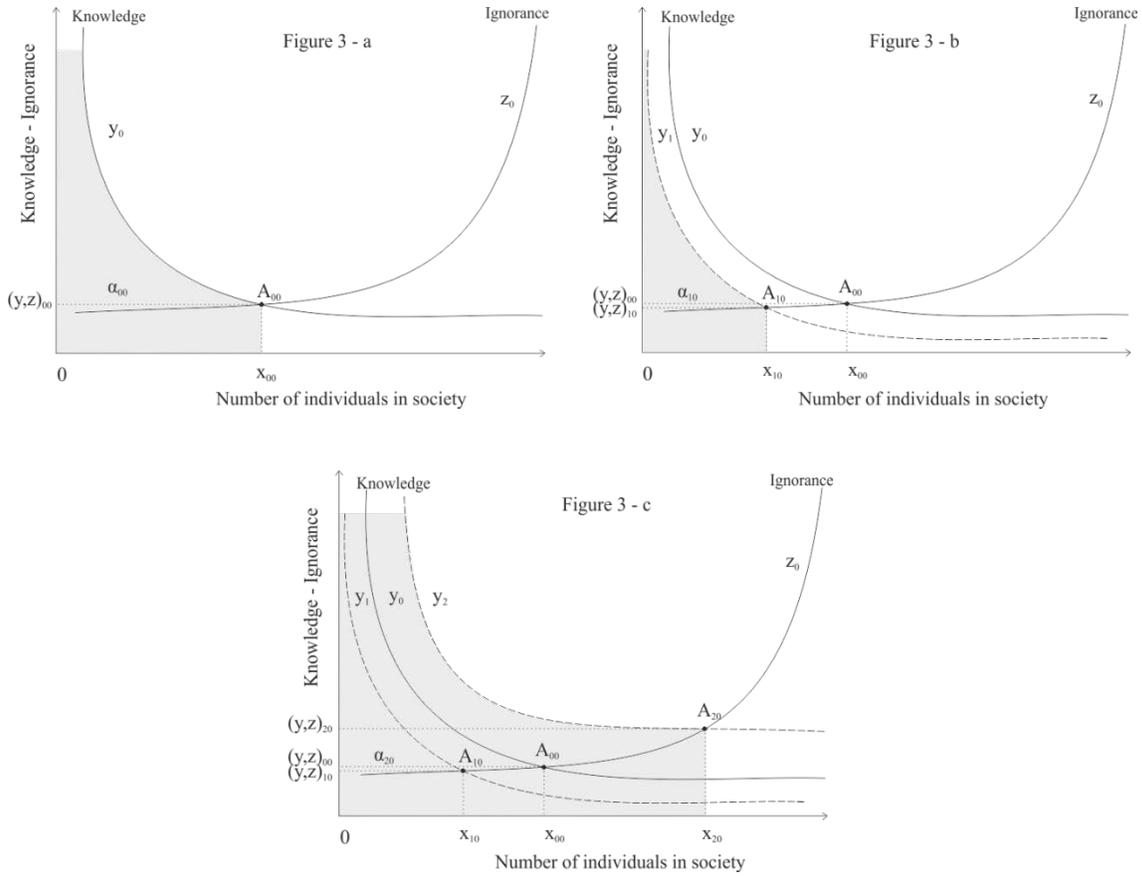
We can conclude that ignorance has three origins: 1) not having obtained the knowledge, the *world  $\beta$* ; 2) Having obtained the knowledge, the actor does not know of its existence; and 3) having knowledge of its existence, the actor ignores it. The curve of ignorance used in our development refers to cases 2 and 3, i.e., when deciding we ignore what is known by omission or by action. Case one is included in the curve of knowledge, and the other two in the curve of ignorance.

## Curve of ignorance



### Curve of *HUMAN EVOLUTION* (CHE)

If we “confront-match” the (available) *knowledge curve* and the *ignorance (disregard) curve*, we can obtain an interesting graphic to show the mathematical rigor we can obtain from epistemology and its consequences for explaining-analyzing human evolution:



In figure 3-a we observe the enormous relevance of the point  $A_{00}$  — the sub-indices refer to the respective curves  $y_0$  and  $z_0$  from which they come — that appears as the intersection of the two curves. Said point, that we call *effective point of used knowledge*, tells us:

- The point that implies the degree of use of knowledge. It is not possible to think of a point to the left or right of  $x_{00}$ , since it is not possible to consider its occurrence, knowledge is or is not used, which does not mean disregarding the idea underlying the exercise.

- The area  $\alpha_{00}$  will be indicating the stock of disposable knowledge used, with what appears to the right of  $x_{00}$  being the knowledge ignored.
- On the other hand, the level  $(y,z)_{00}$  is indicating the median level of knowledge used by the  $x_{00}$  individuals that dispose of it, instant in which  $y = z$ .

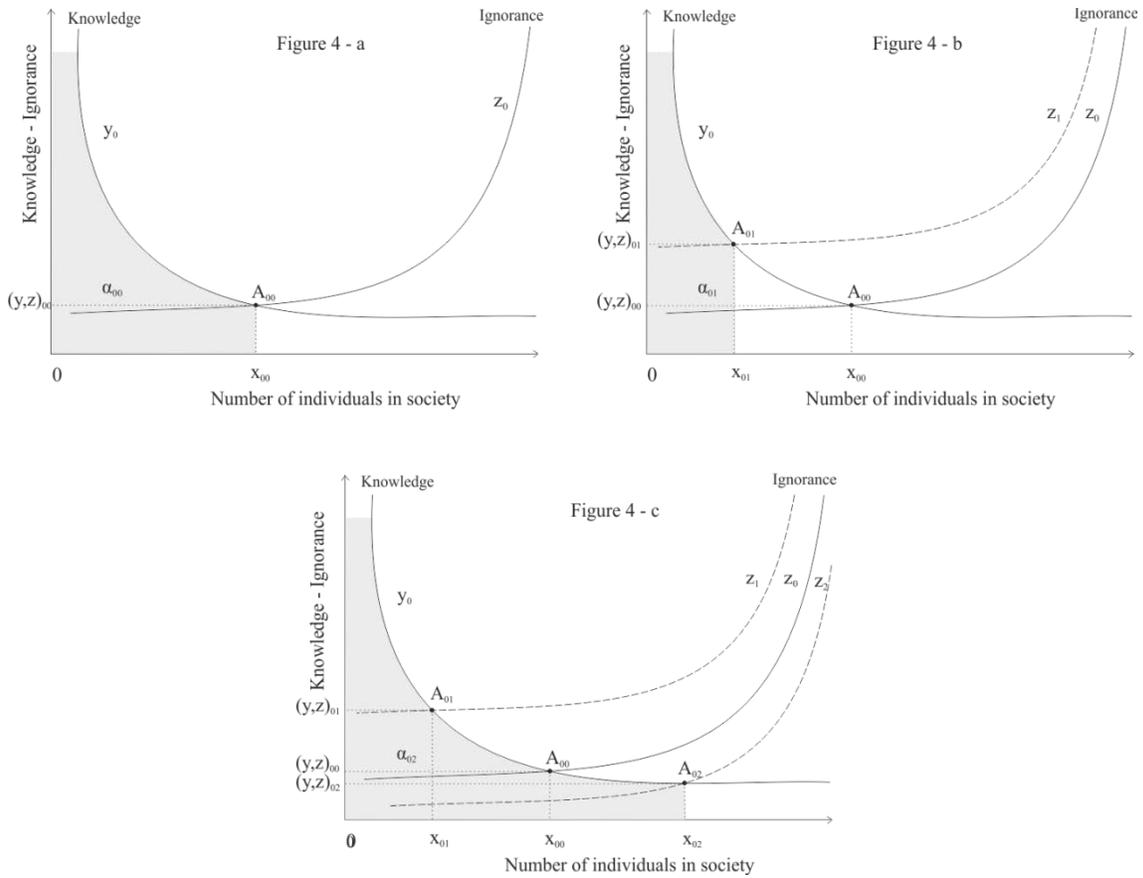
We can observe that with a given level of ignorance ( $z_0$ ):

- A decrease of knowledge –downward displacement of the curve of knowledge (f. 3-b)- implies both an increase in the number of individuals that ignore when deciding ( $x_{10} < x_{01}$ ), a decrease in the median level of use  $[(y,z)_{10} < (y,z)_{00}]$ , and a decrease in the area of knowledge used  $\alpha_{10} < \alpha_{00}$ .
- An increase of knowledge –upward displacement of the curve of knowledge (f. 3-c)- implies both a decrease in the number of individuals that ignore it when deciding ( $x_{00} < x_{20}$ ), an increase in the median level of use  $[(y,z)_{00} < (y,z)_{20}]$ , and an increase in the area of knowledge used  $\alpha_{00} < \alpha_{20}$ .

Figure 4-a), identical to 3-a), is the one we will use now to study the displacements of the ignorance curve we have seen, compared with the same curve of knowledge ( $y_0$ ), and see what we can conclude.

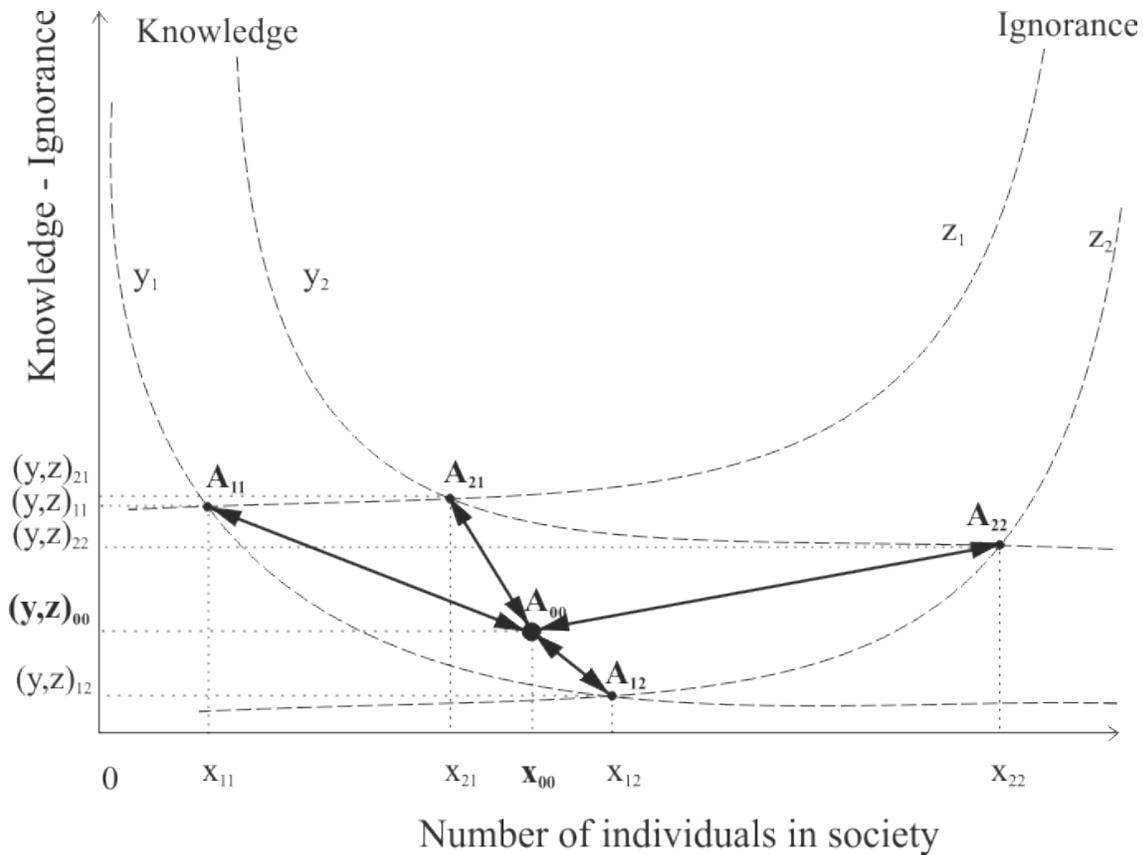
We can observe that with a given level of *knowledge* ( $y_0$ ).

- An increase of ignorance –upward displacement of the curve of ignorance (f. 4-b)- implies an increase in the number of individuals that ignore it when deciding ( $x_{01} < x_{00}$ ), “**but**” an increase in the median level of use  $[(y,z)_{01} > (y,z)_{00}]$ , with a decrease of the area of knowledge used  $\alpha_{01} < \alpha_{00}$ .
- An decrease of ignorance – downward displacement of the curve of ignorance (f. 4-c)- implies a decrease in the number of individuals that ignore when deciding ( $x_{00} < x_{02}$ ), “**but**” at the price of a decrease in the median level of use of knowledge  $[(y,z)_{00} > (y,z)_{20}]$ , with an increase in the area of knowledge used  $\alpha_{00} < \alpha_{02}$ .



Below we will show the *Curve of Human Evolution – CHE*<sup>(1)</sup>, and how it evolves according to each possible case. In this manner, each  $\mathbf{A}_{..} \leftrightarrow \mathbf{A}_{..}$  curve of figure 5-a is a curve of human evolution.

Figure 5-a



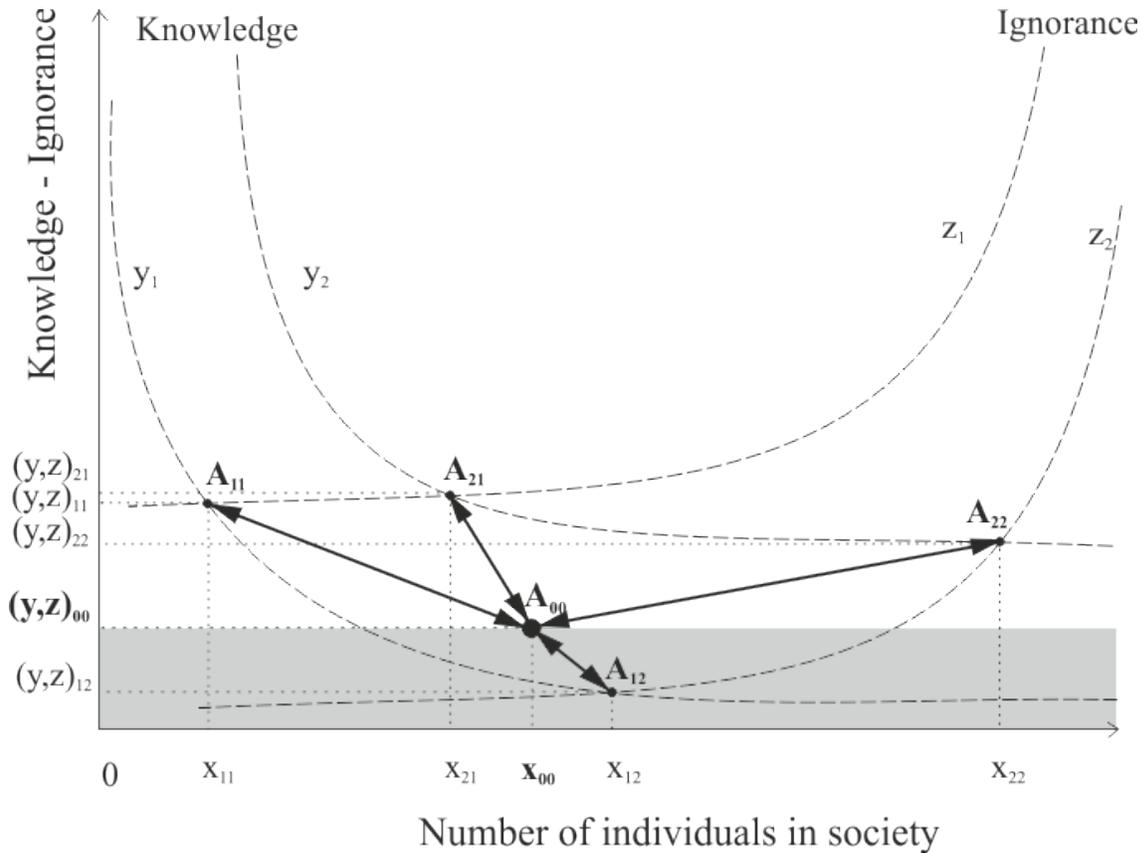
The study will be carried out drawing the line or CHE that will consist of connecting the *effective point of knowledge used* from its point of origin ( $A_{00}$ ) to the destination point, and in the same order the relation of the coordinates that determine each one.

We will then analyze the consequences of the possible *displacements* of the curves of knowledge and ignorance –according to the cases implicit in the figures used here- and their consequences in the movement of CHE. The reader can do the pertinent analysis of movements within the curves, combined with displacements.

WE analyze first the behavior of the *per capita average of knowledge used-ignored*, i.e., indicated by  $y = z$ , when there is displacement of the curves.

Based on figure 5-b we analyze the two cases we want to differentiate, using grey and white areas:

Figure 5 - b



A-1) Increase of the per capita average (white area) originated by:

A-1-a) Increase of knowledge ( $y_2$ ) and decrease of ignorance ( $z_2$ ):  $A_{00} \rightarrow A_{22}$

A-1- b) Increase of knowledge ( $y_2$ ), and increase of ignorance ( $z_1$ ):  $A_{00} \rightarrow A_{21}$

A-1- c) Decrease of knowledge ( $y_1$ ) and increase of ignorance ( $z_1$ ):  $A_{00} \rightarrow A_{11}$

We can clearly observe that that there will not necessarily be a correlation between the behaviors of both variables. Case c): involution, recession,...?

A-2) Decrease of the per capita average (grey area) originated by:

Decrease of knowledge ( $y_1$ ) and decrease of ignorance ( $z_2$ ):  $A_{00} \rightarrow A_{12}$

In this case the crisis of generation is mitigated with expansion of the use of knowledge (decrease of ignorance). A mediocre evolution of lowering standards.

Now we will analyze the behavior of the members of society, in the use-ignorance of knowledge, indicated by  $x$ .

Based on figure 5-c we analyze the two cases that we wish to differentiate, using grey and white areas:

B-1) Increase of participants in the use of knowledge (white area) originated by

B-1- a) Increase of knowledge ( $y_2$ ) and decrease of ignorance ( $z_2$ ):  $A_{00} \rightarrow A_{22}$

B-1- b) Decrease of knowledge ( $y_1$ ) and decrease of ignorance ( $z_2$ ):  $A_{00} \rightarrow A_{12}$

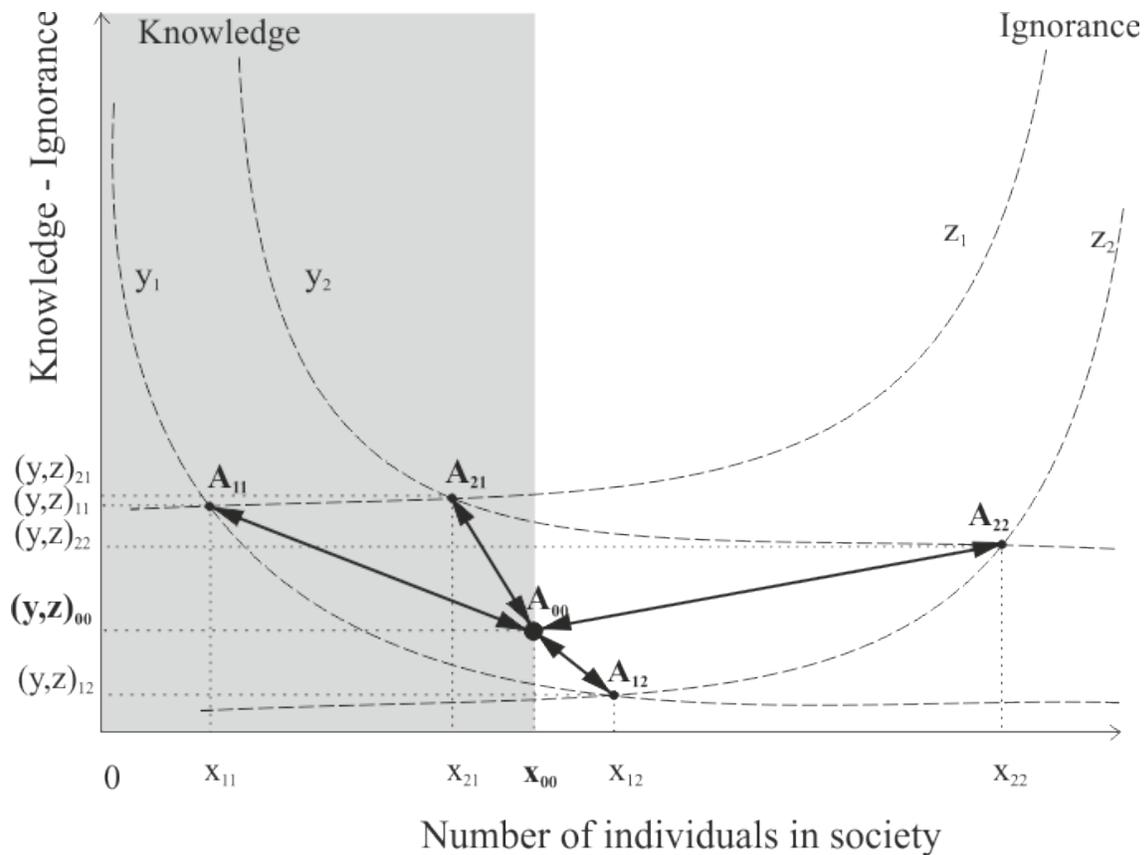
Decrease of ignorance occurs in both cases.

B-2) Decrease in participants in the use of knowledge (grey area) originated by:

B-2- a) Increase of knowledge ( $y_2$ ) and increase of ignorance ( $z_1$ ):  $A_{00} \rightarrow A_{21}$

B-2- b) Decrease of knowledge ( $y_1$ ) and increase of ignorance ( $z_1$ ):  $A_{00} \rightarrow A_{11}$

**Figure 5-c**



The *increase of ignorance* occurs in both cases

Now let us see the analysis that appears when we study the behavior of CHE between two extreme points, not relating it with one of origin, as we did up to now. To this end we present figure 6 where we show directly the “movement” between  $\mathbf{A}_{11} \leftrightarrow \mathbf{A}_{22}$ , representative of cases we can compare in a world in constant change, i.e., where none of the curves remain constant.

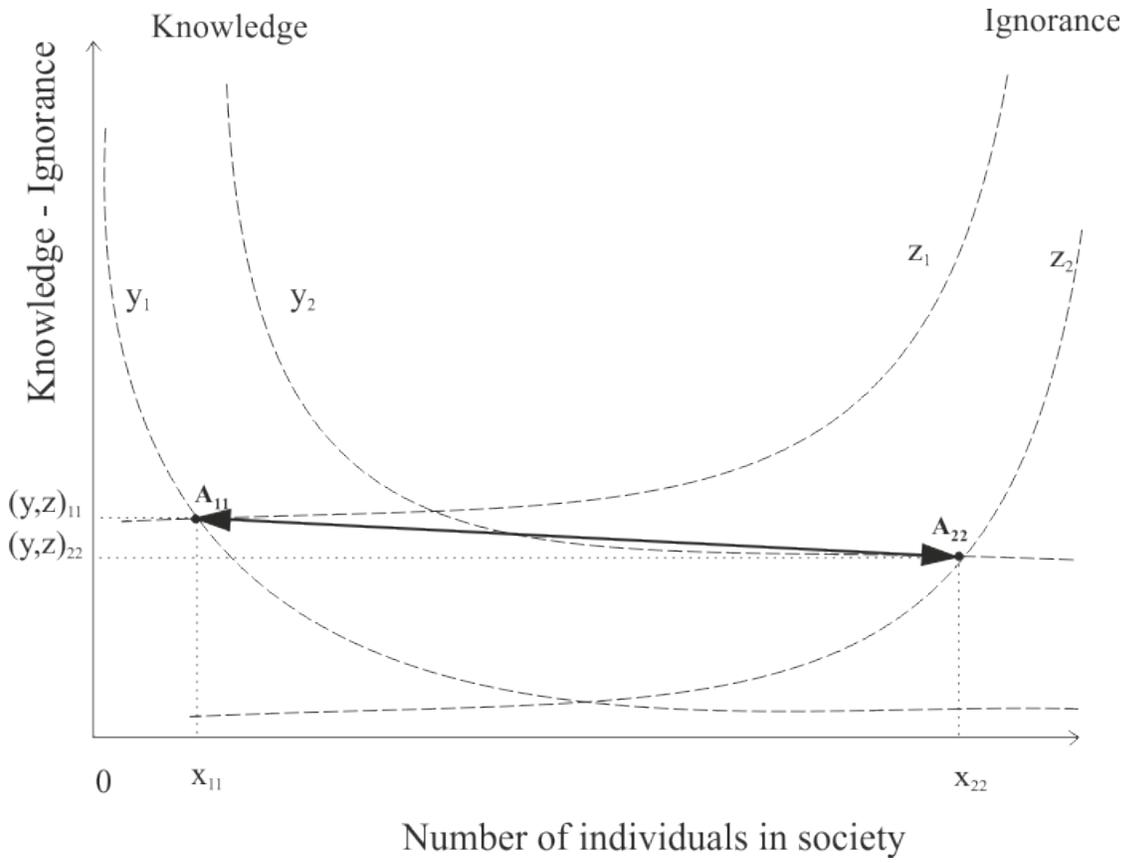
The *curve of human evolution – CHE*, represented by the thick line with double arrow at its extremes, in figure 6, can be considered the behavior of a community, when:

- We have represented the curves of extreme knowledge and ignorance,  $y_1$  and  $y_2$ , and  $z_1$  and  $z_2$ , with the explicit object of presenting a synthesis of the trend a CHE should present as the number of individuals increases in a framework of improvement due to an increase in knowledge ( $y_2 > y_1$ ) and an improvement because of the decrease of ignorance ( $z_2 < z_1$ ), and vice versa.
- It shows an increase in the stock of knowledge, since  $a_{22} > a_{11}$ , and vice versa.
- It indicates an increase of the number of participants in knowledge ( $x_{22} > x_{11}$ ), and vice versa.

The descending-ascending line, as we move between  $\mathbf{A}_{11} \leftrightarrow \mathbf{A}_{22}$  indicates the expansion of the use of knowledge to more individuals ( $x_{22} > x_{11}$ ) is at the cost of a lesser average intensity of use by each individual [ $(y,z)_{22} < (y,z)_{11}$ ], and the inverse process. Which would be in line with the expansion-contraction movements in physics, chemistry, economics (increase of quantities with lower price), etc.

Finally, it is important to stress the process of human evolution does not present a linear relation as what we see in figure 6, instead it is more appropriate to imagine it as spiraled evolutionary process. I.e., it is convenient to see the behavior of CHE in a period of time as the one presented here in the analysis of its behavior starting from a spatio-temporal point and from there analyze the immediate alternatives that can occur.

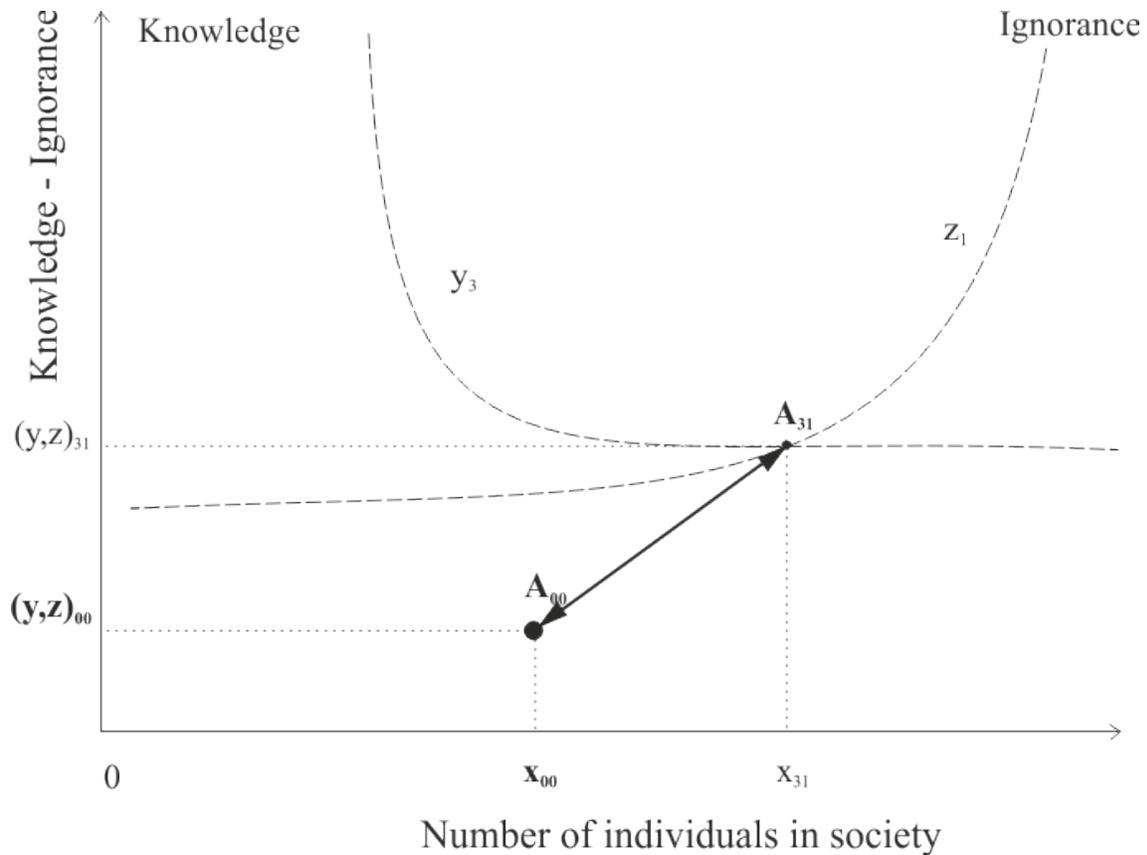
Figure 6



## CHE from a spatio-temporal point

We can observe the conclusions we have arrived at arise from the levels and slopes of the curves of knowledge and ignorance –and their displacements– suggested in the explanatory example. If we observe figure 7, with  $y_3$  above  $y_2$ , we obtain a different conclusion from the preceding one in the analysis  $A_{00} \rightarrow A_{21}$ . Meanwhile, the new scenario with  $y_3$  establishes: an *increase* of knowledge per capita  $(y,z)_{31} > (y,z)_{00}$  and *increase* (not decrease) of participants in the use of knowledge  $(x_{31} > x_{00})$ <sup>(2)</sup>.

**Figure 7**



With the same criterion we can have different combinations, which allows us to summarize the model and present human evolution as a non linear vortex that moves towards one of the quadrants we can consider if we place the center of the coordinates at  $A_{00}$ , which would be equivalent to analyzing the behavior of human evolution starting from a specific spatio-temporal point.

**Figure 8**

**CHE from a spatio-temporal point**

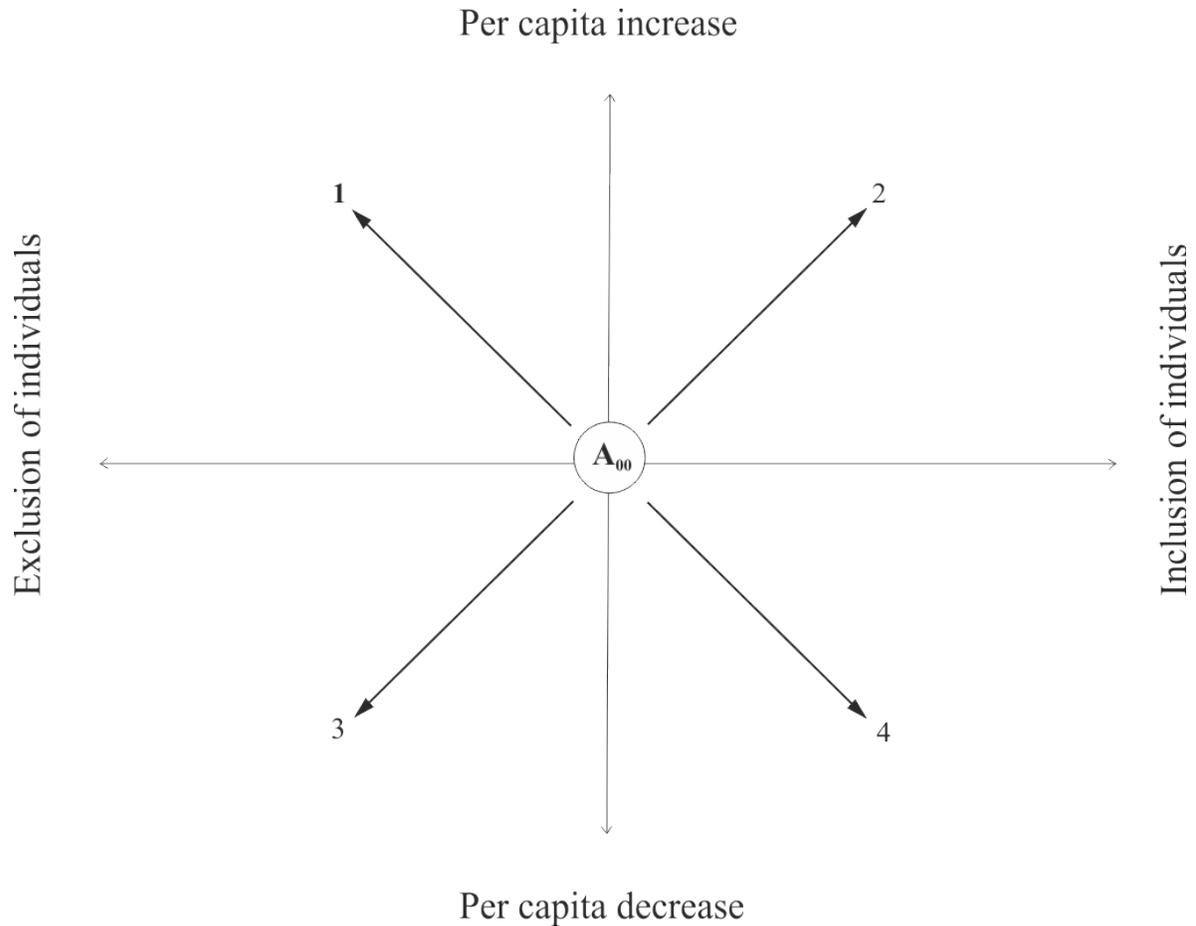


Figure 8 must be interpreted with the concepts of CHE, only we have placed the center of the coordinates at the point  $A_{00}$ . This exercise allows us to study the possible derivations of CHE, as the policies that point to changing the underlying structures of the curves that sustain it, the curves of knowledge and ignorance, are put in place. In other words, it would be like drawing over the curves we have been producing an infinite number of temporal CHE starting from an initial spatio-temporal point. From another perspective, any CHE is a synthesis of these infinitesimal and continuous curves derived from the immediately preceding spatio-temporal point, where the crossing of the original ordinates (zero number of individuals) would be the beginning of human evolution.

Figure 8 shows us two horizontal sections: that of the behavior of per capita knowledge ( $y, z$ ), indicating an *increase* above the abscissa and a *decrease* below it; and two vertical

sections, which indicate *exclusion* of individuals ( $x$ ) that participate in the use of knowledge to the left of the ordinate, and *inclusion*, to the right.

With the help of this figure 8 we can predict summarily the possible scenarios of human evolution, starting from a diagnostic spatio-temporal point ( $A_{00}$ ) and evaluate the path with the highest probability of occurrence that will be circumscribed by one of the quadrants presented by figure 8.

**Quadrant 1:** Per capita *increase* with *exclusion* of individuals.

**Quadrant 2:** Per capita *increase* with *inclusion* of individuals.

**Quadrant 3:** Per capita *decrease* with *exclusion* of individuals.

**Quadrant 4:** Per capita *decrease* with *inclusion* of individuals.

The possibility of any of the four phenomenon that can occur determines that we cannot speak of a virtuous path of growth axiomatically. I.e., there is no dogma that stipulates a positive correlation between the evolution of individuals and society.

Therefore, we can state there are better or worse methods for maximizing the goal determined by society, in our case, the selection of the quadrant-goal. But in selecting the quadrant, we are selecting the problem-goal that society must pay attention to, which ratifies that every action implies the previous existence of a problem, that becomes a goal, starting from which the methods and organization to achieve it appear. This reasoning is what Hayek referred to as a balanced or rational action in the sense of being oriented towards a goal defined prior to the action.

Figure 8 clearly indicates that the evolution of the individual and society are not always positively correlated, and that it is prudent to *rationally* select the best method according to the goal of society, starting from a diagnostic point. On the other hand, just as figure 8 can be seen as a sun expanding energy, converging arrows would express a contraction.

## Conclusions derived from CHE <sup>(3)</sup>

### *Science*

*Universal and rigorous Epistemology:* in so far as CHE gives epistemological fundamentals applicable to all human knowledge mathematical-probabilistic rigorousness.

*Individual and social interest:* it does not necessarily present a positive-negative correlation; there is no *invisible hand*.<sup>(4)</sup> In so far as an action is considered rational when it tends to achieve a goal established a-priori, the *prisoner's dilemma* is not pertinent either to explain that *non necessarily positive correlation*.

*Scientific-professional rank of the decision:* CHE establishes that both the *increase of knowledge* and the *increase of individuals*, imply the feasibility of an individual *increase of ignorance*, ergo there is a greater responsibility of the delegate when deciding in the name of majorities.

### *Politics*

*Democracy:* its survival will depend on not having leaders with arrogance based on minorities possessing *knowledge* ("left" of CHE), or *demagoguery* based on the ignorance of majorities ("right" of CHE).

### *Economics*

*Neoclassic:* CHE

- a) Ratifies its postulate of maximizing man by nature
- b) Rejects its conception of economic balance
- c) Rejects its supposition of the possibility of having complete knowledge when deciding
- d) Rejects the axiomatic tint of virtuous circle of the exercise of individual freedoms (*invisible hand*)

*Austrian:* CHE

- a) Rejects Hayek's postulate that dispersion of lack of knowledge of the individual is the root of the economic problem. Presenting it implies the feasibility of its neoclassic opposite which he rejects.
- b) Ratifies the posture of fallible man as the motivator of action.
- c) Rectifies the spontaneous order since it is included in human evolution.<sup>(5)</sup>
- d) Ratifies Hayek's postulate that an action should be judged rational or balanced relative to a previously established goal.

- e) Rejects the difference between individual and social action when analyzing the rationality of the same.
- f) Rejects the axiomatic tint of a virtuous circle in the exercise of individual freedoms.
- g) Ratifies its essential basis: All things are subject to the law of cause –*fallibility*- and effect –*human action*. A basis that CHE gives mathematical –probabilistic rigorousness.
- h) Ratifies and extends the concept of subjective value over and above the economic field (necessary and scarce). CHE allows its use above and beyond the terrain of market prices.

*Micro-economics: in the rough* we can say CHE ratifies its developments.

*Macro-economics: in the rough* we can say CHE rejects its developments that imply “composition fallacies”.

### ***Ideologies***

*Liberalism*: related to capitalism, democracy, etc., it is a necessary but not sufficient condition in *human evolution*.

*Totalitarianism*: related to socialism, communism, individual equality, etc., is a necessary and sufficient condition of *human involution*. Ergo, its failures are no surprise.

*Twin freedoms ( $l^2$ )*: to generate and use knowledge, it is the best path to a maximizing human evolution. It would seem to be the best method to increase the stock of knowledge, and avoid ignorance when deciding confronted by the problem.

### ***Justice***

As the *scientific-professional rank of decisions* increases (stressed in the preceding section on *Science*) justice must apply the pertinent rules of malpractice to the social representatives in which decisions are delegated, because of:

- a) Arrogance of minorities (knowledge)
- b) Demagoguery of majorities (ignorance)

Judgment that must be independent of the regime of majorities of the elective system by which they gained representativity to decide, be it a dentist chosen by an individual-patient, or a politician elected by so many individual-citizens –executive-legislative-judiciary-administrative-, that can be extended to any social sphere: sports, corporative, academic, etc.

**Notes:**

- (1) Curve previously presented with greater development: [www.carlosbondone.com](http://www.carlosbondone.com)
- (2) A scenario that could be explained by the accelerated progress of underdeveloped countries that incorporate the twin freedoms when they open their doors to the world.
- (3) More about this in [www.Carlosbondone.com](http://www.Carlosbondone.com)
- (4) Our first reflection was that CHE gave it scientific rigorousness.
- (5) Our first reflection was that CHE gave it scientific rigorousness.