Opinion

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When theory tells what is possible

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Jean-François Geneste
Professor of the Practice Space Center, Russia

Correspondence: Jean-François Geneste, Professor of the Practice Space Center, Skoltech, 3 Nobel Street, Moscow 121205, Russia, Email J.geneste@skoltech.ru

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Introduction

In a famous letter Einstein wrote to Heisenberg: "Don't you see Heisenberg? This is theory which tells what can be observed". Whereas these words would still be worth being meditated given the recently observed gravitational waves, the medicine field still lacks a global theory. Empiricism is the rule for curing people whereas biology has made a lot of progress and instilled a bit of theory, but not at the person level which remains, if we want to use some mathematical vocabulary, an unknown. In a similar way, system engineering has tried to put in place rigorous methods in order to build big systems and this discipline mainly was born at the time of the space conquest. However, rigor does not avoid empiricism and there is today no clear definition of what a system is. We should rather say there was no such scientific definition until 2015 when I settled down a brand new theory of systems for other purposes than medicine, but it is a fact that it perfectly fits with what medicine needs in the end. I shall not describe the theory in detail simply because it would be too long for this very short paper. However, I am going to give the basis of the theory on the one hand and its deep potential consequences on the other.

A global theory of systems

The idea here consists under some very simple and logical assumption to consider a system as being a combinatorial game[1] in the mathematical sense. Such combinatorial games have been defined in a mathematical way very recently and the theory is not completely settled because it is pretty difficult. So what do we call a combinatorial game? Here are the criteria.

1. There are 2 players called Left (L for short) and Right (R for short)
2. There are several, usually finitely many positions and often a particular starting position
3. There are clearly defined rules that specify the moves that either player can make from a given position to its options
4. Left and Right move alternately, in the game as a whole
5. Both players know what is going on, that is, there is complete information
6. There are no chance moves such as rolling dice or shuffling cards
7. In the normal play convention a player unable to move loses
8. The rules are such that play will always come to an end because some player will be unable to move. This is called the ending condition. So there are no games which are drawn by repetition of moves

For us on, a system will be considered as a combinatorial game having the above properties.

Applying this to the human body

Nobody should be shocked if we say that a human body is a system! Now, if we consider a human being as a system and therefore as a combinatorial game, we can easily assume that if the human is hit by any illness, we can assume that the illness is a player and has played the first turn. As doctors, if we want to cure the patient, we need to play in our turn and there will of course be a reaction of the illness which will be considered as another round and so on. In the end, what we target is winning the game so that the illness will lose! As an assumption we take that the illness plays the best as possible and is therefore the strongest adversary we can have. Now, we must know to which game we are going to play because depending on the game, the strategy will change and this will be, in our referential, the essential role of the doctor: which game to play to be the most efficient?

When the model implies the existence of infinitesimals

The reader will need to believe us, because there is no room enough to detail all this, but the theory of combinatorial games gives rise to infinitesimal games,[2] a size to which the nanoscale looks infinite in comparison. These infinitesimal games combined with other games give rise to what we call "fuzzy games" and which are pretty complicated to play, even if, as any combinatorial game, the result is somewhat written in advance for the best players.

The different kind of combinatorial games

We shall not follow here the orthodoxy because we speak about another classification as the one generally used. In fact there can be 3 kinds of combinatorial games fulfilling the criteria given above. Those in which we put away some material (such as Chess or checkerboard), the ones in which we add some material (like in Go) and the ones in which we only displace parts (to some extent Go also allows this).

Combining the whole

Combining the two preceding paragraphs we can couple the types of games with infinitesimal actions. For example, in the case when there is only displacement of parts with no addition or subtraction of any material, soft movements of the body or local soft pressures and so on, validate in this model osteopathy and acupuncture. Now, addition of infinitesimal quantities of "medicines" can be viewed as validating homeopathy. At least our model based on our new theory of systems allows this and allows experimental trial and validation. Currently, we are trying to find a way (method) in order to map the theory of combinatorial games together with existing (simple!) systems. This task is pretty difficult but we are confident we shall succeed.

In parallel, we are getting in touch with osteopaths and homeopaths in order to try such an approach with some patients in order to give more scientific ground to the empirical approaches in both cases. We are expecting tangible results in the upcoming 3 to 5 years. For homeopathy, in particular, we envisage the use of nanoparticles in the active primordial soup before very high dilution. The objective is to have a dilution rate which makes that there is no active principle in the homeopathic pills people will ingest, but it will have left a" trace". We are exactly at the place where traditional medicine considers that homeopathy cannot work. The fact is that our theory of systems precisely says the contrary. So, as physicists, we shall be pragmatic: either the experiments work or they do not…

In addition, we do not limit ourselves to the human system, but we also consider the cells as systems, with all the potential consequences this might have. In particular, as a result of the theory, be it at the global body level or at the cell level, if we are playing what is called a zero game, the best is to do nothing. In such a case, acting (i.e. curing) brings to losing and therefore not only to not curing, but it worsens the situation of the patient.

Conclusion

A rigorous, mathematical theory of systems applied to medicine and the human body validates the existing models of curing globally, theoretically and scientifically. This point of view should considerably enhance the efficiency of treatments and of the strategies in order to cure the patients through the knowledge of what game we are playing and what the best strategy to win it, is. As an example outside medicine, we have applied this theory in order to design systems intrinsically resistant against terrorist attacks. What is a virus if not a certain kind of terrorist in the human body? We are currently building some project in order to apply the existing theory to concrete cases and expect to have tangible results in the upcoming 3 to 5 years.

Acknowledgment

None.

Conflicts of interest

None.

References

1. Berlekamp ER, Conway JH, Richard K Guy. Winning Ways; 2001. p. 21-24.
2. Conway J.H. On Numbers and Games; 2000.