Should I learn a new classification system?

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If there is one quality of human beings that distinguishes them from other species, it is the ability to gain knowledge.

The usual definition of "knowledge" is similar to that of Wikipedia: "Facts or information acquired by the human being through experience or education; theoretical or practical understanding of a matter referring to reality".[1*]

It is the human being's original sin. The forbidden tree to which the Bible refers is the Tree of Knowledge; having tried it symbolizes curiosity about the surrounding reality, its knowledge and the resulting condemnation.

This occurs in many cultures and cosmogonies. Prometheus stole the sacred fire of the gods and was condemned to live chained to a rock of the Caucasus mountain where an eagle devoured his liver, but, as he was immortal, the liver grew back at night and, the next day, the eagle returned for its torturing feast.

The sacred fire of the gods was nothing other than the symbol of knowledge. As it is well described, controlling fire was one of the first manifestations of knowledge by the *Homo Sapiens*.

But how do human beings gain knowledge—take in reality as data and incorporate it as "knowledge"?

Many anthropologists and philologists have offered answers that do not go beyond theory.[**]

We all agree on something: the totality and infinity of reality is unattainable by a single person.

Jorge Luis Borges created a character with an extraordinary ability to remember called *Funes The Memorious* who, among other amazing things, in the midst of his boredom, decided to give proper names to numbers.

The decimal system is proof that our ability to learn numbers is absolutely limited to series of ten. There are societies that have only three numbers: "one", "two", and "many".

The amount of knowledge we can gain is a purely social fact and, as such, it has to be adapted to common codes. These common codes, such as the decimal system, are nothing else but classification systems.

Classifications are a finite reading of an infinite reality. They represent the need to limit the inability of human beings to understand what's infinite, and must meet certain conditions:

1. Cover the totality of reality.
2. Be easy to learn.
3. Include a small number of categories.
4. Be reproducible both by the observer and among different observers.
5. Be a common language for communication and discussion.

We group reality into common classes, but this ability to classify, at the same time, shows the extent of knowledge we can reach when making use of this ability.

As knowledge progressed, exceptions to these classifications appeared. When trying to explain them as such, they have been given the name *ad hoc* hypotheses in the context of Epistemology.

When there are too many *ad hoc* hypotheses, the established classification fails and is replaced by another one that covers a greater number of specimens, events or phenomena.

This moment was almost simultaneous to a fundamental change in technology or in theoretical conception. In any case, changes in theoretical conception are but attempts to explain these exceptions or, in other words, to explain what until then could not be explained.

Scientific knowledge is the set of verifiable facts supported by evidence collected by scientific theories, as well as the study of the gaining and development of new knowledge through a scientific method.[2]

This Editorial will not go deeper into this topic, but we can agree on the fact that the purpose of scientific knowledge is the truth, even assuming that this truth evolves and changes.

In our specialty in particular, i.e. Orthopedics and Traumatology, the progression of knowledge is everywhere, reflected–though partially–in a constant development and rejection of classification systems.

Our task as researchers is to focus on exceptional facts that cannot be explained rationally with the elements that knowledge has given us up to that moment.

Faced with a problem, we must ask ourselves "why?" and try to come up with a new explanation, or simply look for a plausible one.

This not only cultivates us intellectually as researchers or adds to our resume, but also enhances our own medical practice, which is merged with our scientific practice. Our decisions are, or should be, based on the scientific knowledge of the problem to be solved. When faced with an exception and digging into its cause, we are producing knowledge.

Taking the fractures of the spine as an example, the first classification was probably that of Watson-Jones[3], which was a purely anatomical one and was not useful to determine a course of treatment, since all fractures were treated, at that moment, in the same way (with a brace or bedrest). In fact, the author thought that all spine fractures were due to flexion.

Holdsworth[4] noted that not all fractures of the spine were reduced by hyperextension, so he concluded that there had to be other mechanisms in the genesis of fractures and fracture-dislocations of the spine, and described a new classification system, more biomechanics-oriented, which distinguished between what is called "anterior column" and "posterior column" of the spine. This was, in itself, an important step forward for knowledge.

With the emergence of computerized axial tomography, Francis Denis[5] developed the concept of "middle column" spine and the idea of fractures due to an injury of said structure (burst fractures), as well as their surgical treatment.

Later on, Magerl et al.[6], in the line of thought of the Association for Osteosynthesis (AO), developed a new classification system based on biomechanics, in which they included the mechanism of injury and the degree of bone and ligament compromise determined in a rational way.

In 2005, Vaccaro et al.[7] added the neurological status of the patient, which was previously ignored for classification purposes.

As can be seen with this example, classification systems express the dynamics of knowledge, and the very nature of knowledge harbors their improvement and replacement with other systems.

In summary, when facing a new classification system, to memorize it and to think about it rationally is to learn new concepts.

It is not a fad. It is an improvement of knowledge. It is a new horizon.

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[*]I have consciously changed the original term "person" to "human being" because it seems to me to be more encompassing.

[**]I recommend the reader Noam Chomsky's works, more specifically: *Knowledge of language: its nature, origin and use*. Madrid: Alianza; 1989.

REFERENCES

1. https://es.wikipedia.org/wiki/conocimiento
2. https://es.wikipedia.org/wiki/conocimiento_científico
3. Watson-Jones R. The treatment of fractures and fracture dislocations of the spine. *J Bone Joint Surg* 1934;16(1): 16-30. https://journals.lww.com/jbjsjournal/Abstract/1934/16010/THE_TREATMENT_OF_FRACTURES_AND_FRACTURE.2.aspx
4. Holdsworth FW. Fractures, dislocations and fracture-dislocations of the spine. *J Bone Joint Surg Br* 1963;45:6-20. https://online.boneandjoint.org.uk/doi/pdf/10.1302/0301-620X.45B1.6
5. Denis F. The three column spine and its significance in the classification of acute thoracolumbar spinal injuries. *Spine* 1983;8:817-31. https://doi.org/10.1097/00007632-198311000-00003
6. Magerl F, Aebi M, Gertzbein SD, Harms J, Nazarian S. A comprehensive classification of thoracic and lumbar injuries. *Eur Spine J* 1994;3:184-201. https://doi.org/0.1007/BF02221591
7. Vaccaro AR, Lehman RA Jr, Hulbert RJ, Anderson PA, Harris M, Hedlund R, et al. A new classification of thoracolumbar injuries: the importance of injury morphology, the integrity of the posterior ligamentous complex, and neurologic status. *Spine* 2005;30:2325-33. https://doi.org/10.1097/01.brs.0000182986.43345.cb