Recursive Distinctioning: The 2016 Clayton, Missouri Conference

By Bob Krone

The *Recursive Distinctioning Team* met for its 2016 Convention at the residence of Dr. and Mrs. Joel Isaacson, 20 Crestwood Drive, Clayton Missouri, 63105, USA, 16-18 September 2016.

Participating were Dr. Joel D. Isaacson, Mrs. Leora Isaacson, Ms. Orna Isaacson, Dr. Louis H. Kauffman, Ms. Diane Slaviero, Dr. Robert M. Krone, Mrs. Salena Gregory-Krone, Dr. John Barker, Mr. Martin Hay, Mrs. Frances Hay, Professor Moshe Klein (via Skype from Tel Aviv University, Israel), and Mr. Joe Sobodowski (via telephone from Florida, USA).

1. Bob Krone introduced the Conference with a three-minute video. The script of the video was:

> I am Dr. Robert M. Krone, president of Kepler Space Institute. The date is September 17th in the year 2016. The location is Clayton, Missouri, USA, where a small group of professionals have met at the residence of Dr. Joel and Mrs. Leora Isaacson.
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> Dr. Joel D. Isaacson discovered Recursive Distinctioning in 1964. He has defined Recursive Distinctioning as a natural principle of nature that occurs across all types of perception and intelligence, and is independent of the particular sensory modalities deployed. The purpose of this meeting is to identify future research, applications and academics for Recursive Distinctioning – which has the short acronym of RD. Those applications will have profound future impacts on many sciences, technologies, industries, and disciplines.
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> Dr. Isaacson's life research in RD has been given a huge impetus by Dr. Louis H. Kauffman, Professor of mathematics at the University of Illinois in Chicago, who has worked intensively with Dr. Isaacson over the past year. Dr. Kauffman has stated; "the principle of distinction/description in recursive process applies at all levels of biology, cognition, information science and computing." Drs. Isaacson and Kauffman published a major paper on the theory, definition, and description of RD in the spring 2016 issue of the *Journal of Space Philosophy* (www.keplerspaceinstitute.com/jsp)….
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> This event has special meaning for me, personally, because I have been a colleague of Dr. Isaacson since we first met at a NASA summer research session in 1980.

2. *Convention Achievements*. All participants judged the conference a success and predicted that it will lead to future RD research and applications that will be additions to current science and technology knowledge across multiple industries, while also impacting all levels of education.

3. During Saturday, September 17 and Sunday, September 18, there were presentations by Dr. Kauffman, Dr. Barker, Dr. Isaacson, Mr. Hay, and Professor Klein (via Skype). Documentation for those presentations has been retained in the RD Team Archives. Summaries of those presentations follow:

   A. *Dr. Joel D. Isaacson*. Joel Isaacson made a short presentation on a tetrahedral molecule that may represent two XOR operations that are required for generating representations of RD icons. In the Fischer projection for such a molecule, the central atom is carbon, or in the alternative, silicon or germanium. The four ligands need to be determined. The two vertical are input terminals and have two states.

The two horizontal are output terminals. A chain of these molecules can be assembled. Depending on chemical signals inputs, the molecule as a whole assumes a state that represents one of four RD icons. The four ligands need not be exotic and are most likely common chemical groups in organic chemistry. However, interpretation of the computational aspects of this kind of molecule requires understanding of polarity strings and quaternions and also four-icon theories as developed by Isaacson and Kauffman and by Schmeikal. It is unlikely that at present organic chemists are familiar with these concepts.

B. *Dr. Louis H. Kauffman*. Louis H. Kauffman talked about the basics of RD and the structure of the mathematical definition of RD due to Joel Isaacson and himself.

   He then explained about iconic alphabets, including a 16-letter alphabet for two-dimensional RD and its relationships with the quaternions. In a second talk, Kauffman described a number of points of view, algebraic and geometric, about the quaternions and the octonions. Kauffman raised numerous questions about the practical applicability of RD, and he described how the simplest RD patterns in one dimension are related to patterns of mitosis and patterns of DNA replication in biology.

C. *Dr. John Barker*. John Barker provided some philosophical reflections on the ubiquity of recursive processes in the biological, cognitive, metacognitive, and linguistic realms, and demonstrated how his computational model of mental processes, ProtoThinker, makes extensive use of recursion in simulating some of these processes. (Prof. Barker's work is supplementary to RD theory and applications).

D. *Mr. Martin Hay*. Referring to Joel Isaacson's pioneering patent on RD and to iterant/polarity string quaternion models described by Lou Kauffman and Bernd Schmeikal, Martin Hay presented his invention of chiralkine systems for coding and processing information about social relationships based on the symmetry properties of chiral tetrahedral molecules. He demonstrated how two interpenetrating, mutually exclusive enantiomeric forms of a chiral tetrahedral molecule can constitute a basis for coding and processing information about relationships in four kinds of state, which states can be described by iterants/polarity strings and interpreted geometrically as the corners and faces of a cube consisting of the two interpenetrating enantiomers. State changes in the system can be interpreted as coupled polarity flips and geometrically as rotations of the cube. Attendees were shown code written to support a new kind of economic system that could function without money, including voting/decision making/dispute resolution and exchange of goods and services/taxation. A new kind of game was also demonstrated, which game could be used to teach

children how rights and obligations are interrelated, and could also potentially be developed for the treatment of brain injury and stroke.

E. *Prof. Moshe Klein and Prof. Oded Maimon* (via Skype from Tel Aviv University, Israel) described soft logic that develops a new monordinate system that makes a distinction between -0 and +0. Any line that is passing through 0 intersects the monordinate system at four points that create a Klein group. This group is analogue to the Klein group that is generated by the four letters SA in RD. **Theorem:** There is an isomorphism between RD and soft logic.

4. Dr. Joel D. Isaacson and Dr. Louis H. Kauffman tentatively agreed to make themselves available for the International Space Development Conference, sponsored by the National Space Society, at St. Louis, on the date of Saturday, May 27, 2017.

5. Dr. Kauffman recommended the title of *Recursive Distinctioning Dynamics* for the RD academics being designed by Dr. Bob Krone, for the Kepler Space Institute's forthcoming PhD in Space Sciences Degree Program (the PhD/DSS).

6. Mr. Joe Sobodowski is the KSI VP for Finance.

7. Scheduling of a third RD Team meeting in 2017 was left for the future.

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About the Author: Dr. Bob Krone is President of Kepler Space Institute (www.keplerspaceinstitute.com). He is an Emeritus Professor of Systems Management at the University of Southern California; has been the principal sponsor for PhD, DBA, and Master's Degree Program candidates for forty years; and is a USAF Colonel (Ret). BobKrone@aol.com.

Editor's Notes: We are grateful to the team for keeping us updated on recent developments. ***Gordon Arthur*.**