KORZYBSKI, COLLOIDS AND MOLECULAR BIOLOGY *

by

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In 1982, I spent a Washington's Birthday weekend listening to the tapes of Korzybski's 1948-49 Intensive Seminar lectures [1]. Among the many topics that aroused my interest was the subject of "colloids". Up to that point, my knowledge of the term was limited to what was contained in *Science and Sanity* [2], which I had accepted at face value. On the tapes, however, Korzybski mixed his theoretical discussions of "colloids" with simple experiments that he chose to illustrate his major points. Some of those experiments (pouring alcohol onto egg-whites, electrically charging two pith-balls to exhibit attraction and repulsion) I've duplicated at an Institute seminar-workshop.

After I listened to the seminar tapes, a few questions occurred to me concerning these "colloidal" lectures. One — were they in accord with scientific data of the 1920's and 30's? Two — what new knowledge have we gained over the years? Three — and of most importance — how does this new knowledge affect Korzybski's generalizations?

To answer the first question, about the scientific foundations for Korzybski's colloidal formulations, I turned to Volume II of Jerome Alexander's *Colloid Chemistry* [3], a series which spanned many thousands of pages and which Alexander edited for over twenty years. Korzybski referenced this particular volume quite often, especially in his chapter on "Colloidal Behaviour". I read the cited articles in Alexander's book and was impressed by how consistently Korzybski stayed within the bounds of a given author's argument. For example, Korzybski stated that "All the main tubercular symptoms can be reproduced, experimentally, by means of colloidal disturbances without the intervention of a single bacterium." [4] The article cited for this remark, (written by Albert Mary, founder of the Institut de Biophysique de Paris), contains ample justification for such a statement, as evidenced by the following quotes: "Experimental tuberculosis has been obtained without the intervention of a single microbe." [5] And later in the article: "These ... pellicles [colloidal particles], emulsified ... and injected into a guinea-pig, caused a profound cachexia, and on autopsy pseudo-tubercles were found in the lungs and peritoneum."[6] Even Korzybski's broader pronouncements pertaining to the unique importance of "colloidal behaviour" or the "colloidal equilibrium" as a basis for life found numerous echoes among the authors in Alexander's volume [7].

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Some additional material for evaluating Korzybski's work on "colloids" can be found in *General Semantics Bulletin Nos. 4 & 5*, in an article written by Ernst Hauser, then Professor of Colloid Chemistry at M.I.T. Hauser went into great detail, quoting from several authors published both before and after Korzybski, to make his point that Korzybski had hit the mark.

In Hauser's own words "... I am convinced that some statements made about colloid science and its implications nearly twenty years ago by Alfred Korzybski are as true and correct today [in 1950] as they were at that time. I am referring here specifically to ... his ideas on the working mechanism of the human nervous system." [8] That mechanism was described by Korzybski as follows: "There is much evidence that the mechanical work of the muscles, the secretory action of the glands, and the electrical work of the nerve cells are closely connected with the colloidal structure of these tissues. This would explain why any factor (semantic reactions included) capable of altering the colloidal structure of the living protoplasm must have a marked effect on the behaviour and welfare of the organism." [9]

Well, enough about Korzybski's concordance with his contemporaries. As to what new knowledge we've gained since the publication of *S & S*, I'd like to mention a few noteworthy achievements. The invention of electron microscopy in the 1930's opened up a new world of cellular study. Increasing our resolving power in this way allowed the visualization of many sub-cellular membranes and organelles, greatly accelerating the differentiation of the once-amorphous "protoplasmic/colloidal stuff-of-life". Even here, Korzybski was not out of touch with these revelations:

> That living organisms are film-bounded and partitioned accounts also for irritability,... sensitiveness to electrical currents. These currents seem to depend on polarizability or resistance to the passage of ions, owing to the presence of semi-permeable boundary films or surfaces... complex structures which are intimately connected with the characteristics of life. [9]

In the next decades, the discipline of molecular biology exploded on the scene with two major discoveries: one, the determination in 1944 by Avery, MacLeod and McCarty that DNA carries the hereditary material [10], and two, the unraveling of the double-helical structure of DNA by Watson and Crick in 1953 [11]. The molecular 'revolution' continues today with the introduction of gene cloning, monoclonal antibodies, etc., research techniques in much use where I work at the Hospital for Joint Diseases in New York.

We now come to the last and most important question: what modifications of Korzybski's discussions of "colloids" appear necessary in the light of so much new data? I have only one major suggestion: a change in terminology. The term "colloids" is now pretty much limited to inorganic physical chemistry and the newer sciences of surface and inter-facial chemistry. Biological uses of the term, in the style of the early investigators, stopped almost 35 years ago. I believe we'd perform a disservice to Korzybski and ourselves by continuing to use such a term in its archaic, biological sense. We can instead, in accord with "modern science", use such terms as "macro-molecule" and "macromolecular", which for the most part convey many of the important life-implications that the term "colloids" did for Korzybski and others. For example, a statement Korzybski made describing his

Silent Levels diagram [12] might now read: "From an electro-macro-molecular point of view, every part of the brain is connected with every other part, and with our nervous system as a whole." I'm not advocating a one-for-one, mechanical replacement of "colloidal" by "macromolecular" in every instance; only that we examine Korzybski's formulations, and make changes where appropriate. By the way, the term "protoplasm" also comes under the heading of "terms to eschew", and a detailed discussion of this can be found in Garrett Hardin's reprinted 1956 article in *ETC.* [13]

Korzybski's main generalizations, which emphasize the importance of multi-ordinal structure for understanding the interactions between the so-called separate 'intellect' and 'emotions', for understanding 'life' and human behavior, require no major modifications in my opinion. After all, the new molecular biological disciplines of neuroendocrinology, neuropsychopharmacology, molecular immunology, etc., represent an out-growth of the colloidal chemistry of the 1920's and 30's, and <u>not</u> a denial of the data on which Korzybski based his formulations.

I'd like to close with a quote from Sir Peter Medawar, a Nobel-prize winning biologist and epistemologist who sums up quite nicely the relationships between the old and the new, and of the continuing importance of <u>structure</u> and <u>order</u>: [14]

> For many years the mystique of protoplasm lingered on in the belief that life might be a manifestation of the behaviour of some complex, exquisitely well-balanced colloidal system.... Today, however [in 1977], it is no longer believed that colloid chemistry is a special sort of chemistry — that colloids have properties other than those to be expected of solutions of very large molecules that often bear electric charges. Indeed, the "basis of life" — if such a phrase has any meaning — is structural in an almost crudely anatomical sense: molecular transformations occur in a certain sequence and in a certain place because the agencies through which they are mediated (mainly enzymes) enjoy a certain orderly structural arrangement. Electron microscopic examination of cells reveals solid structures which have definite shapes... As theories of the protoplasmic genre have quietly disappeared from view, it is to the expert in high resolution electron microscopy... that we now look for an understanding of the way things are ordered in biological systems.

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BIOGRAPHY

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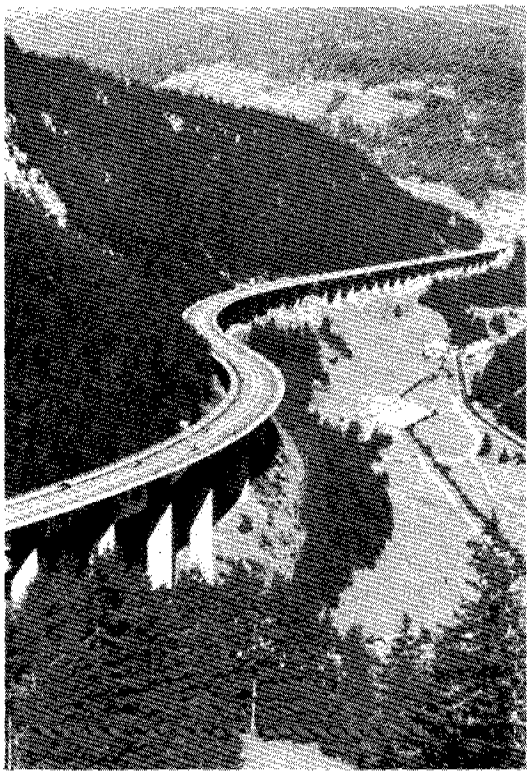
Lueg Bridge, Brenner Autobahn, Germany, 1968.



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