Why Do We Speak of Multi-*Term* Systems?

Dear friends,

From time to time it is good to reread *The Dramatic Universe* and to try to think through the basics yet again. When I do this, I always come to questions about intellectual foundations and nomenclature. In this case, I ask why we speak of the "terms" of a system (instead of, e.g., "components") and of "multi-term" systems (instead of just plain "systems," period, without any adjective). I also point out the connections or at least the analogies between Bennett's thinking and Bertrand Russell's theory of types and plead for us to speak of "Bennettian systems" rather than "multi-term systems," which I show to be a misleading description. I also express frustrations over the confusing interplay of the concepts that go into Bennettian systems theory.

The Definition of 'Term'

On page 26 of Vol. 1 and in the Preface to Vol. 2 of his four-volume *The Dramatic Universe*, John G. Bennett introduces the phrase "multi-term systems." He states in the latter location the now familiar idea, "There are properties associated with each such system that cannot be found in systems with fewer terms" (p. xii). Beyond this, Bennett in Vols. 1 or 2, as far as I know, does not define what he means by 'term'. In fact, up to time I wrote this, why Bennett speaks of a "term" of a system instead of the more customary "part" or "component" has never been entirely clear to me.

First, what is the definitional and philosophical tradition behind the word "term?" Let us start with some conventional sources of information.

'Term' comes from the Latin *terminus*. Its primary meanings in the 1968 Webster's New World Dictionary of the American Language refer to time. "1. Originally, a point of time designating the beginning or end of a set period; set date. 2. A date set for payment … 3. A period of time having definite limits, …duration." These meanings obviously are not what Bennett has in mind, although they might be more relevant if Bennett's ontology gave primacy to process and events over substance, as Whitehead did by substituting for substance the notion of "actual occasions."

More relevantly, 'term' also means, "6. A word or phrase having a limiting and definite meaning in some science." Related to this is "7. Any word or phrase used in a definite and precise sense; expression."

Meanings 6 and 7 might at first seem close to Bennett' s intention, but we should pause and realize that if Bennett's systems were indeed composed of "terms" in this sense of the word, they would be systems of "words or phrases," that is, linguistic or conceptual systems, whereas Bennett also wants to refer to what he calls "concrete" systems.

Ninth is, "9. A limit; boundary, extremity." Certainly "terms" in Bennett's usage are entities with some kind of limits or boundaries or conditions, but does

Bennett mean by ‘term’ the actual limits or boundaries of a system? It doesn’t seem so.

Most relevantly of all, however, we have: “13. In *logic, a)* either of two concepts that have a stated relation, as in the subject and predicate of a proposition. *b)* any one of the three parts of a syllogism.”

Finally, “14. In *mathematics, a)* either of the two quantities of a fraction or a ratio. *b)* each of the quantities of a series. *c)* each of the quantities connected by a plus or minus sign in an algebraic expression.”

In these last two definitions, we seem to come closest to capturing Bennett’s usage. Definition 13 refers to “terms” of a proposition, which, to exist at all, must have certain related components or parts. Definition 14 refers to terms as abstract separate quantities or parts in a mathematical series or expression, as in x + ½x + ¼x + 1/8x …, etc.

Use of ‘Term’ in the Theory of Relations and by Bertrand Russell

The above definitions, however, don’t give us any real history. The 1995 *Cambridge Dictionary of Philosophy* (pp. 688 *et seq.*) does. It tells us that in the theory of relations (which Bertrand Russell did much to advance and expound in the early 20th century), a relation is

> a two-or-more-place property (e.g., *loves* or *between*), or the extension of such a property. In set theory, a relation is any set of ordered pairs (or triplets, etc., but these are reducible to pairs). … The *terms* of a relation R are the members of the pairs constituting R [e.g., *a*R*b, c*R*d,* eR*f,* etc.], the items that R relates. The collection D of all first terms of pairs in R is the *domain* of R; … Similarly, the second terms of these pairs make up … the *range* (*counterdomain* or *converse domain*) of R. The union of domain and range is the field of R.

In addition, the same dictionary, in its article on Bertrand Russell (pp. 700 *et seq.*) gives us further clues that seem directly relevant to Bennett’s use of the word “term.” (We know that Bennett read Russell’s work.) It states:

> On Russell’s extreme realism, everything that can be referred to is a *term* that has being (though not necessarily existence). The combination of terms by means of a relation results in a complex term, which is a proposition. Terms are neither linguistic nor psychological. The first task of philosophy is the theoretical analysis of propositions into their constituents. The propositions of logic are unique in that they remain true when any of their terms (apart from logical constants) are replaced by *any* other terms.
>
> In 1901 Russell discovered that this position fell prey to self-referential paradoxes. For example, if the combination of any number of terms is a new term, the combination of *all* terms is a term distinct from any term. … Russell’s solution was the *theory of types*, which banned self-reference by stratifying terms and expressions into complex hierarchies of disjoint subclasses. The expression ‘*all terms*’, e.g., is then meaningless unless restricted to terms of

> specified type(s), and the combination of terms of a given type is a term of different type.

Here we can see direct precursors of Bennett's use of 'term' and of his hierarchy of system-levels, in each of which the terms have special interdependent meanings not reducible to the terms of a lower-order system.

The Redundancy of the Phrase "Multi-Term System"

Thus, in line with Russell and with mathematical usage, a term seems generically to denote anything that can be referred to in either a conceptual or a concrete system.

But if so, here, then, is the nomenclature problem: the concept of a system as an organized complexity already contains the notion of a multiplicity of terms, and the phrase "multi-term system" is therefore internally redundant. If a "term" is simply a part or component of a system, then <u>any</u> system is already a multi-term system, and "multi-term" points to nothing special. There is no need to speak of "multi-term systems," just as there is no need to speak of "a round circle." In fact, there is a need <u>not to speak</u> of "multi-term systems" because the phrase seems to give notice of a special type of system when in fact it denotes no special type of system at all, at least if Bennett is using 'term' in the same way Russell does. Bennett's use of the phrase "multi-term systems" to characterize and denote the special types of systems he himself elaborates is at best inaccurate and at worst misleading.

What Actually, Then, Defines or Determines a Bennettian System?

To repeat: all systems have parts, components, or "terms," and the phrase "multi-term" applies (redundantly) to <u>all systems whatsoever</u>. But Bennett wants to study or employ in *The Dramatic Universe* only special kinds of what he calls 2-term, 3-, 4-, 5-term systems, etc. Since designating them simply as "multi-term" is in fact non-informative, what in fact defines, characterizes, or determines what we will call for the moment a Bennettian system?

The brief answer seems to be that Bennett is interested in logical and empirical (concrete) structures that exhibit a complex phenomenon that he calls a "numerical quality." Bennettian systems are conceptual tools that he and others developed for systematically revealing and studying this quality. He develops these systems by selecting not just any terms but terms with specific, pre-selected types of criteria.

What Is Numerical Quality?

The idea behind a "numerical quality" latent in the world structure is complex and not easily stated. It begins historically at least as far back as Pythagorean notions that "all things are made of numbers." It also is connected with the notion of "sacred numbers" found in various scriptures.

It is easy to slip into debunked and degenerate forms of mysticism here (e.g., "numerology"), but at a rational level, the notion of numerical qualities is a part of the theory of numbers and numerical relations. The particular type of numerical quality that Bennett searches for seems to be based on the idea that some properties exhibited in the world suggest or even logically mandate a certain minimal invariant number of basic referents or terms.

For example, the notion of *everything*, or inversely the notion of a single identifiable finite entity, seems to correlate logically with the minimum countable natural finite number, 1. Everything conjunctively is one thing, and everything disjunctively (i.e., each countable part of everything) is also one thing. The notions of *many* or *difference* or of a *boundary* or a *contrast* or of actions like splitting, on the other hand, seem to require a minimum of two referents or terms, hence the number 2. And so on.

This numerical quality, this connection between certain qualities (such as unity and diversity) and certain countable quantities (such as 1 and 2) is the beginning of Bennett's intellectual inquiry.

To how many numbers does this connection extend, and to what properties of the world? I don't have a theoretical answer. A "theory of everything" would have to say it extends to all numbers and all properties. But is there such a theory? It's open to exploration. Although all natural numbers have certain basic properties such as divisibility or non-divisibility (primeness), Bennett carries the notion of a hierarchy or progression of numerical qualities all the way up through the number 12, which he links with the notion of perfection. Each of the first twelve natural numbers thus becomes a sign denoting or connoting certain systemic properties of the world structure. It is not the case, in my opinion and I think also in Bennett's, that the number itself qua arithmetic quantity has or *is* the property in question but that the world structure or property in question has in systemic ways invariant numbers of aspects, as in "a stick always has two ends." Thus structures are primary, and numbers are secondary. Structures, at least to some extent, have numeric invariances, i.e., reveal numbers to our experience.

Numerical Quality, Systems, Terms, and Logical Types

Bennett required a number of years to elaborate a general theory of the types of systems he was interested in. In Vol. 3 of the DU, Bennett at last talks briefly about the general properties of his systems and the types of terms that comprise them. However, he does not (at least in the published DU manuscripts) refer to Russell's hierarchy of logical types, which could have provided some kind of background information. (Bennett says in the DU itself that many references to other thinkers had to be cut for lack of space – an extremely unfortunate handicap that has hindered appreciation of the DU in wider intellectual circles.) Consequently, his discussion seems somewhat truncated. I will not try to replicate or critique that whole discussion but to organize for myself an understanding of certain parts of it.

Systems and Structures. In connecting what I think is the basic concept of numerical quality with other concepts in the recipe of what constitutes a Bennettian system, we must bear in mind, first, Bennett's distinction between "structures" and "systems" and particularly Bennett's notion that systems as he deals with them are simplified "modes of experience" of structures, or the idealized "forms" of experienced structures. Structures and our human experience of them and within them as living, conscious beings are primary; systems are derivative. (In other systems theorists, this distinction is often ignored.) "No one system taken alone can exemplify the organized complexity of real structures" (Vol. 3, p. 11).

These "modes of experience" of the world-structure involve sensations, percepts, concepts, and acts of will, which Bennett links to automatic, sensitive, conscious, and creative "energies"; and which others would link to Gurdjieffian "centers" and "parts of centers"; and which still other people would link simply to neurological hierarchies in the way the brain and nervous system process information. For Bennett, human experience is not just disembodied "observation" but is in a constant tension and struggle over survival and fulfillment of subjective aims – and thus a drama. An objective systems examination of this experience and of the preconditions of experience per se as a property of entities might be able to lead to the conclusion that we live in a dramatic, living universe – that we are "not alone" as experiential entities and that we have a task and a destiny of a very high order within this universe. It's a tempting wish.

Systems and Terms. Bennett's systems, his idealized "modes of experience," employ not just any terms (or items of experience) but very carefully selected terms. While his stated aim is to encompass all items or types of items of human experience within the set of systems that he develops, there seems to be in Bennett's thinking a less than adequately explored interplay between **system** and **term.** Bennett states (Vol. 3, p. 10): "A **system** is a set of independent but mutually relevant **terms**. The relevance of the terms requires them to be **compatible**. No one term can be understood without reference to all the others." We should keep in mind here analogies to Russell's hierarchy of incompatible logical types whose terms cannot be intermingled. Bennett has adopted or adapted this type of construct, I believe, in his own systems thinking.

The independence of the terms, on the other hand, requires the terms to be "distinct." The union of these two concepts is what Bennett calls "term-adequacy" (Vol. 3, p. 13). This already provides, it seems, the basis for an ongoing tension between ideal Bennettian systems and the actual structures they seek to reveal.

At first, one might get the impression from "No one term can be understood without reference to all the others" that the terms of a given system must be simply necessary and sufficient to be able to form the system in question, as in the concept of a proposition, which, depending on its form, requires either three terms (subject, copula, predicate; or subject, verb, object) or two terms (subject, verb) in order to be instantiated.

Read literally, however, what Bennett is apparently saying is even stronger: that <u>no one term</u> of a system can be understood without reference <u>to all the others</u>. In the case of the constituents or terms of a proposition, which surely qualifies as an organized complexity or system of concepts, we would have to see and verify not just that propositions cannot exist without, for example, subjects, predicates, and copulas, but that subjects, predicates, and copulas each cannot be understood without reference to the other two.

Taken literally, in isolation from the looser notion that the terms must be "compatible" and of the same logical type, this is a pretty stiff requirement, and it is made dubious by the observation that correct linguistic grammar allows "subjects" to enter into sentences that are not propositions (e.g., questions, such as "Did he stay or go away?"). In other words, the concept of a subject may be necessary to understand the concept of a proposition, but the concept of a proposition is not necessary to understand the concept of a subject. Since the relation of subjects to predicates is also contingent, the same disjunction would apply to that pair of terms.

When we move from systems involving concepts *per se* and their logical implications to systems involving concrete particulars, the requirement that the terms cannot be "understood" without reference to one another becomes obviously untenable because the terms are linked contingently and not by logical necessity. An example is a host-parasite system, which resonates strongly at the numerical level of twoness. Despite this, there is an asymmetry in the system: a "parasite" and its survival cannot be understood without the organism that "hosts" it, but the host organism <u>can</u> survive and be understood biologically without the parasite. Thus the two terms of the system are not mutually interdependent at either the biological or the conceptual or logical level. The same result, however, would not obtain in a true symbiotic system.

System Order, Term Designations, Numerical Quality, and Logical Types. We saw that in Russell's usage, a "term" in general is anything that can be referred to. Bennett mentions (Vol. 3, p. 10) that "In systems, there are no fixed meanings attributable to the terms, which depend on the structure of the system as a whole …" However, he later adds (p. 11), "The mutual relevance of all the terms of a system requires that they should be of the same logical type and make contributions to the systemic attribute of one and the same kind. This we shall indicate by a common **designation**. Thus the terms of a dyad will be called its **poles**, those of a triad its **impulses**, those of a tetrad its **sources** and so on."

Here again one sees the influence of Russell's theory of types. Terms of a higher-order type, i.e., that function within a higher-order system, like a triad, cannot function in a lower-order system such as a dyad, although as Bennett makes clear, terms of a lower-order system can function within *subsystems* of the higher-order system.

In analogy with Russell's theory of types, within Bennettian systems of the same order, logical type, or numerical quality, all the terms have a common "designation" which is supposed to be suggestive of that order, "numerical quality," or logical type. But do all these phrases refer to the same thing? Are they all strictly linked to one another? Is logical type part of term "compatibility"? Or is it something separate? What I've read leaves me unclear.

Let's say that a structure, for example, a magnetic field, may exhibit in our experience a "numerical quality" strongly resonant on twoness, and this structure may be represented as a dyad or second-order or "two-term" system. The two terms must be "compatible and "mutually relevant," must seem to involve one another in some logical or causal sense and thus have the same "logical type," and on this basis the two terms are suggestively designated as "poles."

These designations are loose and poetic. Are we thinking about magnets and magnetic poles, which occur only in pairs that repel or attract one another? Or are we thinking about the two "ends" of a pole (a stick), which exhibit no dynamic attractive or repulsive quality? For a stick considered as a two-term system, the terms might be more appropriately designated as "ends." Or what about conceptual systems involving something like partition or branching? Are "poles" an informative term designation for that type of two-term system?

I give examples of qualitatively different two-term systems because, although the number two is essential to all of them, and they thus have the same system order, they seem to be of differing "logical types" or to have differing qualities in some non-numerical sense of that phrase.

Thus I bring into question the vagueness of the notions and notional interconnections of concepts such as numerical quality, systemic attribute, term-adequacy, logical type, and term designations in relation to system order in Bennett's usage. In some second-order or two-term systems (e.g., magnets), the twoness ("numerical quality") is connected with a tension or a field tendency to produce motion, where in others (e.g., quantum branching) it indicates active bifurcation, and in others (e.g., spatial or temporal distances) merely passive separation, or even (e.g., boundaries) the mere abstract notion of difference. Term designations (e.g., "poles") across such widely differing types of "twonesses" may or may not be accurate and informative.

Although Russell might be able to define logical type very clearly within his own theory of types, we have to ask what, indeed, does Bennett mean by "logical types" and these other concepts? He doesn't interdefine them in this context, and one worries ultimately whether Bennettian systems really study structures of experience objectively or whether they pre-select the data through the various requirements of "term-adequacy" to create the world edifice psychologically wished for. Human wishes for a "dramatic," "meaningful," and soul-satisfying universe can indeed guide the choices of the tools we employ to "find" such qualities within it. We need to be wary.

Conclusion

In conclusion, Bennett's use of 'term' instead of 'part' or 'component' seems to be explained historically and simply rests on Bertrand Russell's nomenclature.

However, since all systems are multi-term by definition, this description, contrary to Bennett's own usage, is not what uniquely characterizes a Bennettian system. What uniquely characterizes Bennett's approach is the <u>concern with the *numerical qualities* exhibited by the structure</u> <u>of the world</u> as revealed and experienced with the help of a pallet of idealized forms of experience that we can call "Bennettian systems" – the monad, dyad, the triad, and their subsystems, etc. Finally, we need more work on and understanding of the foundations of Bennettian systems to make sure that we are not pre-selecting only the data that give us our wished-for conclusions about a meaningful and dramatic universe.

John Dale

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