

Cause and Coincidence: The Serial Structure Of Reality

...being the lost paradigm of Paul Kammerer, elucidated by
John Townley and Robert Schmidt...

All German translation from *Das Gesetz Der Serie* by Robert Schmidt

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Overview

As we journey into the twenty-first century, humankind is increasingly being faced with a universal crisis. It's not an economic crisis, or a moral crisis, or a political crisis, or even a technological or ecological crisis, although all of these are involved and contribute to the larger problem.

It's a reality crisis.

The more rapidly and radically the world around us changes, the more we must look to find some kind of universal personal and social foundation in reality upon which to ground ourselves to face the wind and storms of change. Without that, we will (and are being) blown away. Yet

everywhere we look to find this necessary grounding, we are presented with contradictions, right down to the perceived physical reality we have to deal with on a day-to-day basis. Nothing contributes to this more than the fast pace of change and the flood of information created by the ubiquity of the computer, which increasingly has become not only the tool but the driving force of our culture. Using mathematics and physics of the strangest sorts, it assures us that life is a quantum gamble, where nothing is certain except statistically, and information that describes our state at one moment is irrelevant the next. We are catapulting ourselves toward the dream of virtual reality when we don't know what our reality is to begin with.

At the bottom of it is, simply, cause and effect. To feel stable in the least, we need to know, in a phrase, what comes next. That used to be obvious. Life worked on ordinary cause-and-effect, Newton-style, and seeing was believing. Anyone who had a different version probably didn't have his head screwed on tight. Not so, any more, or so it seems. Drop a tab of acid, and internal gauges of reality turn upside-down, often making as much or more sense than the original. Or, if you're of a more legal mind, get a scrip for Prozac and change your whole personality for, perhaps, the better. Or perhaps not. Suddenly that bag of trash you throw out has become an insult to the planet, a previously inanimate object which now has become Gaia. You're supposed to get along with something you didn't even know was there. Too complicated? Believe on Jesus and it'll all be OK, unless you wind up in Jonestown or with the Branch Davidians. Pursue the prophets of the New Age, if you can find one that makes sense for more than a few months. Or, follow the scientific method and reject all the rest as airhead garbage -- and find your funding, and community support, too often cut out from under you.

Part of the problem is communication -- as long as your input is limited and consistent, you can bring yourself to accept the status quo and reject the occasional anomaly. If you only encounter one person who has been in contact with extraterrestrials, you can discount it as crazy. When the media brings you thousands who have, reality begins to falter. Everyone experiences a strange coincidence now and again, but when you find out they are a regular occurrence, flying in the face of accepted logic, you wonder which part, if any, is really real, or if reality has any collective meaning at all except on a personal, moment-to-moment basis. That's our current price of knowing too much and understanding too little. It's been going on for more than a century, but recently it's been getting all too intense.

Pop science and philosophy like to label this a paradigm shift -- a good enough buzzword -- but which paradigm do you pick? How often do you have to shift horses in mid-stream before you find a reliable mount?

Part of the problem has been in the approach. When, for instance, you give up science for the Bible, or vice-versa, you simply exchange mutually exclusive belief systems, which doesn't get you anywhere -- just one set of failings traded for another. So, too, with most of the "paradigms" currently being offered. Throughout history, successful paradigm shifts have proceeded from a more limiting view of reality, albeit somewhat still workable and based on facts formerly available, to a more inclusive one, which includes the previous but enlarges upon it to include more recently acquired information. Evolution generally does not reject a previous stage outright, but expands and improves upon it. So, general relativity did not invalidate Newtonian physics, it expanded its limits with a larger view which kept the old, working system and included a larger explanation for what did not fit. Our perception of reality thus is like a growing crabshell, or a snake shedding its skin, each keeping the original interior but bringing in more space as the result of growth. Of course, it's those growth spurts without a shell or skin when things get a little dicey.

As a lifelong collector of oddities and anomalies, and a student of pursuits outside the more recent paradigm such as astrology and spiritual technology, it long seemed to me that there would have to be an overall structure of reality which explained all (or at least most) of the many observations that seem real enough to practical experience and yet do not fit into the currently accepted overall picture. Too much of everyday experience did not fit the mold, and when that happens, you've got to change the mold, despite what establishment pundits may insist upon. The trouble is, who's got a new, bigger, and better structure to drop it all into?

A lot of people in the 1960's spent a lot of time searching for just that, through drugs, music, religion, fringe science, and a host of other avenues which have altered our culture irrevocably, but only in the direction of change and flux, not of solution. We're still at it now, but with a host of individual new structures that often don't get along very well. So where's the big picture we're all looking for?

One of the notable seekers of that turbulent decade, though not of that generation, was Arthur Koestler, and his seminal book *The Roots Of Coincidence* went far to try to explore the alternate realities that the new physics, spiritual awareness, and global consciousness were bringing into being. In that book, he mentioned an early 20th century scientist named Paul Kammerer who had first addressed the universality of unexplained coincidence and related anomalies and from whom Jung, allegedly, had derived his concept of "acausal synchronicity," now such a popular phrase. Unlike Jung, who had made the whole thing a very personal and unexplainable affair, Kammerer had used a very universal, scientific (for the time) approach -- collecting, cataloguing and structuring the events which he encountered. In fact, he had even published a large work on the subject, *Das Gesetz Der Serie*, in 1919. Alas, he died shortly after, and the work had moldered ever since, never even translated out of the German. I quietly thought to myself at the time: nothing is going to get organized in our generation unless we first go back and see what was done already in such an extensive work. And I let it go at that, having no access to the work.

Over a decade later, I mentioned this to a friend of mine, Ellen Black, who, being an astute researcher, went and dug up a copy of Kammerer's book, obscurely gathering dust in a California library. She gave it to her husband Bob Schmidt, who was a skilled translator with a deep background in philosophy and science history, and soon bits and pieces of the tome began to come to light.

Bits and pieces it was, too, for at first it didn't seem to make a lot of sense to Bob, despite his background. It seemed, on first reading, to be a tantalizing but confusing set of data and cryptic theory which probably didn't hold water -- the very reaction Koestler had, who more or less dismissed it in his book. Yet on second, and third, and fourth readings another picture -- and a very difficult one -- emerged. Kammerer was proposing concepts for which there was no previous vocabulary, no ready-made words to allow the mind easily to follow what he was saying. He was manufacturing ideas which went beyond and enveloped widely-disparate fields, unconnectable at his time and only partially-connectable now. He was, as we found, a truly visionary thinker whose concepts presaged the recent developments of chaos, systems, and complexity theory and beyond. As I had suspected all along, this looked like the key to unite the multiple but limited new paradigms which have been arriving on the scene since the 1960's. Forthwith, we commenced on doing a translation and commentary on *Das Gesetz Der Serie*.

But as it turned out, we couldn't just translate it, for a variety of reasons. First, it was peppered with references to contemporary scientific and philosophical theories it was presumed the reader was familiar with, most of which would be alien to the modern reader, and most of which were essential to the points being made. Simply to annotate those would make the original 400+

page book into an encyclopedia. Second, the heavily German writing style itself was so dense (despite the fact that Kammerer considered it a popular-style book) that few would wade through it. Folks don't have the patience these days, and for good reason -- too much other information around you have to assimilate.

Most important, however, was the difficulty we ourselves had in wrapping our heads around the concepts presented. Without precedence in our (or anyone else's) experience, we would understand parts of it in a flash, and then lose it the next day for lack of a mental handle to cling to. So, over a period of seven years, we had to work it into our lives until we understood it from a gut level and could put it into words with enough current scientific and social distribution to make sense. As we journeyed through Paul Kammerer's world, we would suddenly realize, "Oh, that looks like chaos theory!" or "Here's a step beyond Rupert Sheldrake," or even more strangely, "That's Newton with an octave added on."

As the modern connections, which Kammerer had no access to, became clear, so did dozens of applications which he could not have conjured up specifically, though they were often suggested in the original work. Here was a proto-thinker, come and gone before his time, and it was our task to bring the rest of the job home to the 21st century. I say "rest of the job" with some hesitation, as each of the many application areas we discuss toward the end of the book suggests broad avenues of research and testing we could never have the time(or funding!) to pursue. What we have tried to do is encapsulate Kammerer's ideas in a way which we can understand and so, we hope, can others. We have tried to do it simply, although it is not simple material, so we risk being accused of shallowness and oversimplification. Yet we do so in order to provide the material access to the broadest possible range of readership, to reach the many who will benefit from it the most.

When Paul Kammerer wrote *Das Gesetz Der Serie* in 1919, he intended it to be for a popular audience. He felt then, as we do now, that it was an idea whose time was soon to come. In this, our presentation follows his dictates, despite the risk of making it too pop. We have also had something of a similar dilemma in presenting the material over seventy years after its original publication, in which we have tried carefully to include the most recent, leading edge discoveries and attitudes of modern science within a theory that still embraces and even goes beyond many of them. Herein we try to provide an overall starting point, a basic thrust for others to pursue once the ideas have come into the public venue. We have avoided individual, clinical scientific suppositions which should await full experimental evaluation before publication(although we suggest them) but rather present a series of broad assertions that will only get tested because of publication and subsequent controversy(as was the case, for instance, with the theory of relativity). Kammerer's work is not just another step forward which is connected to and linearly develops the past, it is a leap that embraces the future, which must develop and apply it, just as much of the 20th century was spent proving, developing and applying relativity. In addition, so much of the material is concerned with elevating the most basic of common sense that for much of it, you have to climb inside it and drive it around for a while to see how it gets results -- and that is better done on the street, not in the lab, which is yet another reason why we present it initially as a popular book, as Kammerer originally envisioned it.

Ultimately, we hope the effect of absorb in this material will bring upon the reader what it brought upon us -- both a broadening of understanding (so that's how it works!) and a depth of centering (I somehow knew it all along) that will bring greater comfort and confidence to being an organism whose evolutionary potential is a reason unto itself.

-- John Townley

1. The Crack In the Paradigm

"Research has once again distanced itself from life in many ways. It has no lifelike kind of thinking and speaking and considers it beneath its dignity to be scientifically distracted with questions of everyday life." -- Erwin Hanslik

It has recently come to the attention of the general public that things are not as they seem. Or, perhaps more properly, things may indeed be exactly as they seem but are not at all the way they are supposed to be. For years there have been incidents and accidents, hints and allegations: rumors that what we learned in school wasn't the whole truth, that what scientists and historians were telling us was in part (or sometimes wholly) fabrication. There have been whispers, nagging doubts that the scientific world edifice that we have so often struggled against common sense to understand and accept may indeed make little sense at all.

It really started in the 1950's, when we were the most comfortable with the belief that we really did know most of what there was to know about the way our world and the universe was run -- from Newton to Einstein, modern scientists had blazed a trail of enlightenment and progress undreamed-of by the alchemists, astrologers and other merchants of ignorance and superstition that went before them. Following the inexorable logic of the scientific method, we had conquered the land, sea, and air (and soon space), made deserts bloom, cured diseases, turned our lives of unnecessary work and drudgery into idylls of ease and convenience. By the simple act of right thinking, we had shown the world more improvement in three hundred years than it had known in the previous three hundred thousand. And now that we were really in control of things, it was only going to keep getting better at an exponential rate, forever.

There were rumors around to the contrary, but they were mostly ignored. The likes of Bernard Heuvelmans, Willie Ley, and Ivan Sanderson suggested that maybe there were animal mysteries that were not just unknown to, but unexplainable by, modern science. UFO sightings by surprisingly reputable people stirred the imagination with thoughts of alien cultures (mostly hostile) who could perform mysterious feats, and early researchers into the likes of ESP and other spooky "paranormal" phenomena were beginning to suggest we might be overlooking something -- but most were casually debunked and kept their places on the sidelines. When they got too noisy, like Wilhelm Reich, they were thrown in jail to die for their contrariness.

But with the publication of Rachel Carson's *Silent Spring* in 1960, a fissure in our consciousness was opened that within a generation would rend our world-view asunder and send scientists and public alike floundering desperately for another understanding of the way things work. Not that Rachel Carson was radical or anti-scientific -- if she had been, she would have been all too easily dismissed. Rather, she showed with the very observational tools of science itself that we were not in control of our technology because we hadn't bothered to think how any of it fit into the big picture. While spraying DDT to protect our crops and quell insect-borne diseases, we were unwittingly destroying the fabric of life on earth that supported us and made it possible to seek progress to begin with. Science had shot itself in the foot without even noticing it -- and who knew where the next shots would land? It was seriously scary, because it began to dawn on many that perhaps we had created a monster that might be already out of hand and we didn't even know it.

What other boons of science were about to bite back, and why hadn't we noticed them? Atomic waste? Industrial chemicals? Air pollution? Ozone destruction? Global warming? Mass extinctions? Electromagnetic disruption?

What had seemed like a small hole in the edifice of modern scientific thinking turned into a floodgate of cultural shock and concern. Contrary to our most firmly-held beliefs, we had got it wrong. In the most dangerous way, we didn't know what we were doing and we might be blindly charging down the road to universal destruction as the result of our folly. What we thought had been our salvation might turn out to be our undoing because we hadn't really understood it all, after all. It was enough to give science a bad rep.

Well, if we didn't know what was really going on, we had better find out sooner rather than later, and so the hunt for a new way of looking at things -- a new scientific and philosophical paradigm -- was on.

Ever since, suggestions for the new vision of things that will get us back on track have not been in short supply. A host of alternative scientists, philosophers, techno-visionaries, gurus, and even politicians have offered sometimes outrageous alternatives to the meat-and-potatoes universe built by the likes of Newton and depended upon by most of us for so long with such success. In response, conservative scientists and their supporters have circled their wagons to ward off attacks by the crazed and the lunatic fringe in the belief that the general populus is ready to buy anything, however irrational, that might seem to provide a quick fix to the problems getting out of hand.

In addition, whole new approaches to science and technology have opened up that add fuel to everybody's assertions and consternations without actually suggesting broad solutions in themselves. Good examples are the explosion of applications of chaos theory, fractal analysis, and biomagnetics, all of which create more questions than they resolve. They demonstrate the ordinary world working according to methods and patterns which we intuitively recognize but cannot integrate with our previous overall understanding of the order of things. Indeed, they call into question the basic power of our science to make reliable predictions.

In an attempt to reach a definitive "reality," each approach makes its definitions of what it believes reality to be, and then mucks around with it. In Newtonian science, it's very seductively simple: for every cause, there is an effect; for every action, a reaction; things remain as they are until something changes them, and that's that. What could be simpler? But Newtonian principles can only be proved to work in simple, limited situations. Take billiard balls. The player shoots, the cue ball hits its target, and its energy is transmitted -- the first one stops, the next moves on. But what happens when you've got a whole table of billiard balls in motion -- is it just a very complicated version of the first situation? How about a billion billiard balls? And suppose you stuck in fifty million players, to boot. Do that, and you've got something amounting to the tangle of statistical physics, where the motion of particles by the billion can't be predicted one at a time or even in limited groups, but only by statistical mechanics. In quantum physics, many of the principles of reality we normally take for granted break down -- or at least that is what quantum physicists tell us, based on their observations.

These two relatively "old" approaches to how things work, Newtonian and quantum physics (about 300 yrs. and 100 yrs. respectively), are what we've been basing our cultural and technological development on since they came into vogue. But it seems they've failed us, if their obvious fruits are to be believed. It would appear that the approach to analyzing reality, based on the results of limited, controlled, and repeatable experiments, does not apply very well in the wild, where many overlapping and uncontrolled systems are in effect. Neither is the indeterminate

statistical approach very helpful when you need a specific answer and not just a mathematical guess. Any alternatives?

No problem -- there are lots of other ways to look at reality being postulated right now, so one of them is bound to be proceeding pretty much in the right direction. Maybe, but if so, which one? And does that one cover it all?

Some approaches, however inspiring or sincere, may be eliminated by common sense fairly early on. Any approach, for instance, should be able to explain all the phenomena that Newtonian and statistical physics applied to so well. It should, therefore, be inclusive of earlier successful though limited approaches and yet expansive enough to embrace areas not yet explainable. In a way, relativity and quantum theory did that, since it left classical physics in its place while going on to explore and chart smaller and larger realms that the earlier paradigm did not attempt to contemplate. Yet they have no particular significance for the world of our everyday experience. Now that they are both found wanting, what can be envisioned that will include them and go on to an even larger picture?

Perhaps if enough physicists found enough particles that could provide the answers to why the other particles are behaving like they are, not only now but through all time since the Big Bang and into infinity, we might find a Grand Unified Theory that would suit the limited observations that a physicist can put together with a brace of supercomputers and the best atomic accelerators. But we are also faced with the much more complex world of our own everyday devising. A single human brain can outperform the most complex operations of a supercomputer, and there are billions of us interacting on the planet, along with a staggerly greater number of other animals, plants, and other beings with independent lives of their own (more about those later) which defy our analysis by the best of any physics and its theories.

When physics has to deal with large numbers of unruly atoms, molecules, electrons, etc., it turns to statistics. Perhaps that's the solution -- even humans behave according to statistical analysis, at least some of the time. But it's when we don't behave that causes the problem -- worse, even the relatively cold and "inhuman" physical world doesn't abide by our former statistical analysis of it, either. Sudden catastrophes, strange anomalies, runaway reactions all interpose themselves to tell us that the world cannot be smoothed out by statistics, as long as there are individual, seemingly unpredictable elements that make up the wholes we are trying to understand.

So if focusing on the individual case, as with Newtonian physics, isn't reliable, and a statistical sweep of the mass of cases won't do either, how do we figure out what's happening? Are we lost in a morass of undefinable reality where things only work by the rules we know when they feel like it, and leave us hung out to dry when they don't?

The answer may truly be: yes we are lost, as long as we depend upon the rules instead of our actual observations.

In quantum physics, it is believed that you cannot ultimately know the state of a subatomic structure, because you have to interfere with it to observe it -- and thus you've changed it. This is a paradox we have been struggling with for hundreds of years. We have evolved a way of looking at reality that requires the observer to stand outside of it all and analyze what's going on, deducing rules and structures as a result. In very limited, circumscribed circumstances, in the laboratory, we can do this -- and this has become the essence of the scientific method. Having observed our limited actions and reactions in the laboratory, we then apply them to the rest of the world with often miraculous results, but only as long as we stick to limited systems which we can control and which we are fundamentally apart from.

But in the real world, we are usually stuck right in the middle of the mess we are trying to understand, and circumstances become very recalcitrant when we try to apply our isolationist tactics to the reality soup we are swimming in. The more we flail about trying to influence things, the more unpredictable becomes the result of our behavior and that of our surroundings. You can't be in the middle of the experiment and expect it to perform as if you were outside of it.

And yet, that's life. You are in the middle of the experiment and always have been, but you've trained yourself out of noticing it. What you notice, instead, are the elements that aren't working according to plan and you either have to deny their existence, twist your original way of seeing to fit them, or come up with an entirely new paradigm to cover it. What kind of unaccommodating elements are we talking about, and how are we trying to cope with them?

First, as above noted, we have stumbled on the recognition that we are destroying our exterior habitat -- the earth and all the systems which sustain our life. Starting with Silent Spring, this has triggered off the Green movement and much more large-scale interactive analysis of how our environment sustains itself. Here, multiple theories both scientific and spiritual abound, the most all-encompassing is the well-known Gaia hypothesis, which supposes all life on the planet to be a self-regulating organism which adjusts even the chemical proportions of the atmosphere and oceans to maintain optimum conditions for its sustenance. The results are by no means in on this, as the long-term data as well as the necessary chemistry is somewhat in doubt. The more detailed the data on the recent geological past, the less stable this model seems, though it would appear that life itself seems robust enough to sustain even extraterrestrial collisions, perhaps repeatedly. This does not, however, imply self-regulation, necessarily, just a very strong system that tends to maintain itself in the face of daunting odds.

Second, we have begun to conclude that we are not only destroying ourselves from without by neglecting the consequences of our interaction with our environment, we are also destroying ourselves from within. We conquer one disease after another, at great ingenuity and expense, and another one takes over -- some of which, like violence and war, seem to be of our own internal making and by no means on the decline. Here we have turned to alternative medicines, holistic healing, various semi-spiritual forms of medicine that combine mind, body, and more, such as therapeutic touch. Along with them go new theories of fundamental human and general life makeup, such as bodies of etheric, mental, and spiritual matter superimposed upon the merely physical shells we used to think of as ourselves. Sort of green medicine, often replete with borrowings from shamanism and other earlier paradigms where we may have thrown out the baby with the bathwater. At the same time, radical new physical ideas of the structure and organization of consciousness and its interrelation with the immune system and physical body in general fill the science journals. There's a good overview here somewhere, but right now no real agreement, and still the violence increases.

Third, we've begun to notice we're seeing things -- literally. All kinds of perfectly bizarre phenomena which we were willing to discount as chance or error in reporting are now being confirmed by sheer mass of observation. When your flakey neighbor claims after-death experiences, telepathy, sees a ghost or is abducted by aliens, you can write him off. When thousands of people, independently of each other, do the same, it tugs at the strings of reality. Ghosts, apparitions, shamanistic magic, parapsychological phenomena of all sorts crowd our individual and collective stage, along with a host of conflicting theories which might explain each one individually, but with no theory covering all. Perhaps most common to all, "synchronicity" has become an accepted buzzword, but a descriptive one only -- there seems to be no physical basis for it. It has all the meaning of "random" -- something we can't account for but hope, by inventing

a word for it, to put in its place, distance it. Yet it may be from the exploration of this most pervasive of unexplained phenomena that the key to the rest of it may be discovered -- an inclusive paradigm that allows the rules we accept to go on functioning while embracing the phenomena we cannot explain.

Actually, such an approach has already been around since its originator Paul Kammerer presented it in 1919, but it has been lying dormant since his death in 1926. His remarkable surmisings forecast many of the most sophisticated mathematical ways of viewing reality and cause and effect only developing now, long after his demise. And they imply much more than science has yet dared project or religion has been willing to submit to. Perhaps the fellow was really on to something.

The story begins with the man, and the world he was forced to live in, which is where we begin our journey into "seriality" and all it implies...

2. A Man Not Of His Time

The in-brief biography of biologist Paul Kammerer and a possible murder mystery...

Paul Kammerer was born August 17, 1880 to a prosperous family in Vienna, Austria, the only child of aging parents and grew up as the favored child of three stepbrothers from two previous marriages. Spoiled by his doting family, he had the best of everything and was raised more as an English country gentleman than an Austrian bourgeois. His unusually sharp mind, fertile creativity and active disposition led him to excel at animal training, mountain sports, nature studies, and music. He was what we would call today exceptionally "gifted and talented" and had the good fortune to grow up in a family that gave him every opportunity to express and develop his potential.

As he reached adulthood, he threw himself into a career of music and arts, studying music at the Vienna Academy and composing highly original songs reminiscent of Mahler, Schoenberg, and Berg. His charismatic personality made him a favorite of the ladies (as he was, sometimes to his detriment, all his life), and his lifelong courtship of and affairs with the reknowned Wiesenthal sisters may have been involved with his death under highly suspicious circumstances. He counted as his friends the elite of Austrian musical society, among them conductor Bruno Walter and composer Gustav Mahler.

A Renaissance man in an era of increasing specialism, he also followed his love and fascination with animals, studying zoology at the University. His family background of animal breeding and his amazing personal touch with animals finally led him to biology as his main career. At the age of twenty-two, he joined the Institute For Experimental Biology, known among biologists as "the Sorcerers' Institute," to which he remained attached for most of his life. Experimental biology was a new field at the turn of the century, a cutting edge of what was traditionally the rather staid world of zoology which relied on theory and description. While traditional scientists merely stood back and observed and theorized, the "Sorcerers" were dissecting, cross-breeding, trying out new and artificial environments, and generally trying to find out what made life, genetics, and evolution tick with a direct, hands-on approach. This get-involved method of science was viewed with a mix of skepticism and jealousy by the scientific establishment, partially because it often got notable and surprising results, and partially because it was hard for others who did not adopt this approach to replicate some of these results.

As time went on, a number of important scientists passed through the Institute, such as von Frisch, the discoverer of the dance-language of bees, and Paul Weiss, whose limb transplant experiments changed the face of neurological theory. In the first quarter of the twentieth century, however, Paul Kammerer was the Institute's unchallenged star. His papers were widely published and often startled his contemporaries, and his magnetic lecture presentations enthralled both lay and scientific audiences around the world.

Had Kammerer's work been simply a better and more advanced version of what his contemporaries were working on, he would probably have gone down in history as an accomplished scientist among many instead of ultimately finding his work literally expunged from the scientific record. But Kammerer was an original, and that was to be his downfall. His experiments were designed to prove and elucidate upon what was then becoming a highly unpopular version of evolution, that proposed by Lamarck, rather than the neo-Darwinian approach that had established itself by that time. It is a sad tribute to the universal qualities of humanity that scientists will fight to the death to maintain their theories and professional status, sometimes in total disregard of the truth, just the same as cutthroat capitalists or warring factions of an army bent on economic or political domination. Kammerer was a fatal victim of such a conflict, for the very reasons that make his contributions so relevant to today's search for a new scientific and philosophical world-view.

So what was there in Lamarckism that so thoroughly enraged the neo-Darwinian establishment? It was a fundamentally different view of the mechanism by which evolution progressed. Both sides agreed that evolution occurred as the result of biological adaptation to environmental change and stress, but each differed about how it was done. Lamarckism held that as individual sets of animals were forced to adapt to new physical environments with new types of behavior, some of what was learned trickled down to the following generations, which then changed physically to incorporate some of these more advantageous characteristics. It proposed the inheritance of acquired characteristics, where the learned adaptations of the parents were not entirely wasted but were in some respect passed on to future generations to improve the line. It was an idea that had its roots in classical antiquity and had seen varying allegiance ever since. At a very intuitive and holistic level, it seems the logical way to go about things -- Darwin himself vacillated over the issue all his life, though his followers went on to reject it outright.

Neo-Darwinism proposed that evolution only occurred as the result of chance mutations that happened accidentally to improve an animal's chance of survival and which were subsequently transferred down the line because the animal survived and others less fortunate didn't. The essence of Lamarckism was reward for struggle, learning, and adaptation on the individual level, whereas Neo-Darwinism relied entirely on the throw of the dice, so to speak. It's easy to see why the former should have so much more innate moral and religious human appeal, but also easy to see why science at the time, with its anti-religious and purely materialistic overtones, should have favored the latter. Science for hundreds of years had been in a long battle to exclude religion and moralism from its house, and so close to victory it was not about to take under its wing any theories that smacked of the enemy.

For most of this century, the Neo-Darwinian view of evolution has predominated, but like much of the rest of the old scientific paradigm it has lately been showing some dangerous cracks, only partially patched by its followers. The greatest of these is its fundamental conclusion that, if evolution is the result of random processes, then it should occur evenly and gradually across time. Recent discoveries in the fossil record, however, show that the opposite is often true -- evolution tends to happen in sudden bursts or hardly at all (a conclusion clearly implied in Kammerer's

work). Moreover, recent experiments with bacteria, among other creatures, seem to show that some organisms do immediately and consistently transfer their physical and chemical responses to environmental stress to their progeny. While modern biologists and evolutionists struggle to make some direct physical link with DNA to explain the anomalies, Kammerer's theories may suggest a much more subtle and far-reaching answer.

Kammerer's first important experiments just after the turn of the century were with two species of the European salamander, the black Alpine *Salamandra atra*, and the spotted lowland *Salamandra maculosa*. The black variety reproduces by giving birth to two, fully-formed salamanders, while the spotted version begins as a number of eggs deposited in water, which hatch tadpoles that subsequently mature into full adults. In the former variety, the egg and tadpole stages are completed in the uterus. Kammerer raised examples of each species in the laboratory in reversed environments: the Alpine variety in a moist, lowland environment, and the lowland version in dry, cool, Alpine surroundings. It was a long experiment, as the creatures require four years to mature before reproducing. When they reproduced, each species showed the reproductive characteristics of the other. Then, when the following generation came along, each retained the new characteristics.

This did not necessarily prove the inheritance of acquired characteristics, nor did Kammerer claim that it did. The new patterns could have been latent in the animals and merely surfaced as atavistic throwback to previous evolutionary states. But it established his primary approach of transplanting animals to radically altered environments to see what changes occurred and whether they maintained themselves after reproduction.

Further experiments with salamanders proved more intriguing. Sets of the black-and-yellow spotted variety were raised exclusively on either black or yellow soil. Each set gradually acquired an increasing amount of coloration matching its new background environment (a result well-known in other animals as well). When placed back onto their original background, however, their progeny retained significant coloration from their parents' earlier experience and development, coloration which was decreasingly retained through several generations. This very much pointed to inheritance of acquired characteristics, indeed.

Simplest, and most convincing, were Kammerer's experiments with the Ascidian sea-squirt (*Ciona intestinalis*). These primitive aquatic animals live just beneath the sea-bed and possess two siphons that protrude into the water above them, one for water intake, the other for expulsion. When cut off, these siphons regrew, each time becoming longer, sometimes in the extreme. Then, when they reproduced, the elongated siphons were inherited. A simple, and seemingly conclusive, experiment which could be easily reproduced without the skilled animal husbandry required of most of Kammerer's experiments. Yet, to our knowledge, no one has attempted it again to this day.

Yet it was Kammerer's most difficult and least conclusive experiment upon which he was attacked and which ultimately became his undoing. It was upon the "midwife toad" (*Alytes obstetricans*), so-named because the male carries the female's fertilized eggs upon its legs until they hatch. In the case of most other toads, which mate in the water, males develop black "nuptial pads" with small horns in them on their palms and fingers to help them stay attached to their mates in the slippery environment until fertilization can be achieved. Midwife toads, however, which mate on land, do not exhibit this feature. Following his salamander approach, Kammerer decided to see if raising midwife toads exclusively in an aquatic environment would cause males to develop nuptial pads. It did. Furthermore, subsequent generations raised on land retained them. Kammerer thought little of the experiment, however, "as the atavism objection can always be raised, it is not

very clear to me why just this experiment is so often looked upon as an experimentum crucis. In my opinion it is by no means a conclusive proof of the inheritance of acquired characters.”

But this particular experiment caught the eye -- and raised the wrath -- of famed British biologist William Bateson, who was certain it must be in error at best or a hoax at worst. In 1910 he travelled to Vienna to see for himself and was further put off when Kammerer did not have a preserved specimen to show him (he had few enough live ones) and the live ones were not in mating season. Convinced he'd been had, Bateson went back to England and began a series of attacks upon Kammerer that continued until his death in 1926. When Kammerer finally did bring a remaining specimen of the toad to England in 1923, despite the fact that most of his animals and laboratory work had perished in World War I, Bateson refused to even look at it.

It was in 1926 that neo-Darwinists delivered a fatal, if in fact accidental blow, to the famed Austrian biologist. It came not from Bateson, who died in February of that year, but from his colleague Dr. G.K. Noble, Curator of Reptiles for the American Museum of Natural History. He published an article in the August 7, 1926 issue of *Nature* asserting that the remains of the one decaying specimen of the midwife toad experiments was, in fact, faked. Earlier that year, he had visited the Institute and examined it, with Kammerer's blessing, and had found barely any evidence left of a nuptial pad, and what remained appeared to have been injected with India ink. This was as much a shock to Kammerer and the Institute as to the rest of the world for, as many fellow-scientists testified later, it was highly unlikely that Kammerer had tampered with the ageing carcass. Perhaps a lab technician, in an attempt to retain the coloration, had added the ink. No one will ever know, thanks to the sudden turn of events that occurred in the next month.

Although he took no responsibility for the tampering, Kammerer knew the scale had tipped against him and Lamarckism in general. One scandal was quite sufficient for the scientific community, now sold on Neo-Darwinism, to dismiss all other evidence to the contrary. Only in the newly-formed Soviet Union did Lamarckism still reign (and has continued to, to this day). Yet there, it seemed, his salvation beckoned. He received and accepted an offer to become head of the Soviet Union's most prestigious biological institute, and in September was enthusiastically packing his laboratory equipment and files to move to the Crimea and begin his experiments all over again.

But it was not to be. On the early afternoon of September 23, Kammerer's body was found on the slopes of the Schneeberg, a mountain near Vienna, sitting up against a rock, a pistol in his hand, killed by a single shot to the head. The story had ended.

The death was immediately ruled a suicide, committed by a man in despair over a ruined career. But was it? That may never be fully known. The circumstances would, today, have caused a thorough investigation. Kammerer was left-handed and was shot in the left temple -- however, he was holding the gun in his right hand. He left behind no less than four suicide notes, all typed, one to his wife, one to a colleague, one to the Moscow Academy of Science, and one to his mistress, famed singer Grete Wiesenthal. The note to his wife was found in his typewriter the day after it was written, but still a day before his death, yet no attempt was made to find him to prevent his suicide. Although the contents of the note to Wiesenthal and most of that to his wife have never been disclosed, the gist of the others was that although he denied any part in the faking of the specimen, he could not accept the denial of his life's work and his ties to Vienna were too close to leave.

What really happened? The story has the makings of a good mystery movie: perhaps murder by the perpetrator of the hoax to cover up a neo-Darwinian conspiracy. Perhaps the excuse at last for a spurned wife to end her pain. Perhaps a distraught suicide brought on by Grete

Wiesenthal's refusal to come with him to the Soviet Union, combined with a realization of the grim prospects that country actually promised.

Whether the official ruling is murder or suicide, in the end it was murder -- murder by the piecemeal destruction of a man's life by causes beyond his control. Snowballing opposition in a scientific community with a closed mind, wanton destruction of his laboratory, animals, and research by the devastation of war, conflicting emotional entanglements of a too-full heart in a too-restricted society -- all contributed to the death of a man who blossomed too early and was cut off by late frost. Now that spring may have arrived, perhaps it is time to replant the seed.

It's been a long spring coming. Kammerer's ideas not only fared ill among his contemporaries, they were subsequently misconstrued and/or misdeveloped by those that followed him. The most well-known of these was psychologist Carl Jung, who coined the phrase "acausal synchronicity" much of the origin of which is attributable to Kammerer's pivotal concept of seriality (*Synchronicity, An Acausal Connecting Principle*, 1952). His critical error was the presumption that the concept need be "acausal." Quite the opposite, Kammerer believed it simply to be a more complex and refined version of ordinary causality and stated so quite clearly in his work.

But Kammerer was dead and in was no position to defend himself, and Jung redeveloped the idea according to his own lines, defining it as accidentally associated events that directly connected with an interior psychic reality which somehow transcended the physical. The idea was adopted widely during the 1960's to explain every sort of mystical phenomenon, from mind-reading to the I Ching, and is still very much a fundamental, albeit fuzzy, cornerstone of New Age thinking.

Kammerer's seriality was again raised from the dead by Arthur Koestler in his short biography of Kammerer, *The Case Of The Midwife Toad* (1971), and in his influential exploration of parapsychology *The Roots Of Coincidence* (1972). In both these books he insists that Kammerer had proposed an acausal principle separate from the normal rules of nature and then proceeds to dismiss him on this very basis. This, despite Kammerer's repeated protestations to the contrary. Only at one point does he admit that although, "the theory can be shown to be wrong in almost every important point, yet it shows tantalizing flashes of intuition." Einstein, on the other hand, found the theory to be "by no means absurd." If Jung or Koestler had read the book a little more carefully, they might have shared that opinion. Indeed, it may even turn out to be quite causal in hindsight that, for instance, Kammerer's biographer shared his method of death (Koestler also committed suicide) and that one of the authors of this work shares his birthday (August 17).

Yet, in a way, Jung and Koestler were prisoners of their own level of information and what current thought believed causality to be. Had they been presented with the types of causality that modern chaos theory and fractal structure admit to, they might have found these to seem equally acausal, as these concepts so vastly extend the recognized structure of causal systems. Following on quantum physics, which was willing to to admit to entirely acausal events on the atomic level, Koestler and Jung (and his physicist mentor, Wolfgang Pauli) were more willing to address the extension of acausality to everyday events than to explore the possibility of a much more sophisticated and deeply-imbedded form of classical causality that might apply there.

As time would have it, science has now swung more toward visions of reality that fall along the path Kammerer might have predicted. Like the early, pre-Socratic Greek philosophers and scientists whose visions later congealed into the Classical thought that was to become the basis for the Western paradigm, so Paul Kammerer's work could only suggest in the broadest scope the direction that needed to be taken. This he said himself. Yet, as our new vision begins to take shape, his guideposts may be of the utmost importance to help unify our efforts and point the way when our destination becomes unclear.

Paul Kammerer is in his grave, but his work is not yet done.

So what did K say? That's:

Chapter Three: Kammerer's World View

"I do not want to be a victim of the tragic fate, to finally recant a life consecrated to the clarification of natural occurrences by sinking into the darkness of mysticism; at most I want rather to plunge down into its depths, in order to lift as much of its solid foundation as possible into the light. To free hitherto occult things from mysticism, not to hide things that have already been illuminated behind a mystical veil: that is my goal and task." -- P.K.

In *The Law of Seriality*, Paul Kammerer very carefully elucidates a new world-view as he evolved it, beginning with his own unique starting point: coincidences.

Coincidences: we are surrounded by them. When they are startling enough, they rivet our attention. Most of the time, however, we dismiss them without a second glance. Suppose, for instance, you are browsing through the morning paper and run across an unusual last name, the same as that of an old friend you haven't heard from in years. You lay your paper down and look outside the window, only to see a delivery truck pass by with same unusual name emblazoned on its side. Then the phone rings, and -- it's your old friend you haven't heard from in years!

That's the kind of coincidence we all notice. Similarly, most of us at one time or another have picked up the phone to call a friend only to find he or she is already on the other end, a strange simultaneous communication without even the chance for the phone to ring. Was is ESP? Mind reading? Or just random coincidence? It makes you wonder...

We more easily dismiss events that are even more unlikely, but not as personally compelling. You're driving around New York City and see three Alaska license plates at different times and places on the same day. You hardly notice it, but the chances against it happening are astronomical -- you probably saw the only three such plates in the whole city of millions of cars, but it just doesn't grab your attention. Still you do notice it, however little it may impress you, and perhaps you mention it in passing to your spouse. If your spouse has independently had the same experience, then you're impressed, though not nearly as much as you should be, because you have just witnessed a virtual statistical impossibility.

The fact is, however, it doesn't really make that much of an impression, because these sort of things happen all the time and our minds more or less take them for granted. In many cases, these kind of events are enshrined in folklore -- like the "rule of three," for instance, an idea that has been around since Democritus and Aeschylus in Classic Greek times. Plane wrecks, train wrecks, shipwrecks and other disasters tend to turn up in the news in threes bunched fairly close together in time. Waiting for the third to turn up is like waiting for the other shoe to drop. Another saying goes, "Speak of the Devil and up he pops," the folkloric description of a person coincidentally coming into view when spoken of. "It never rains, but it pours," shows the observation that things come in clusters. In gambling, we speak of "runs of luck," or the dice being "hot," although we think we know that the throws of the dice are always random. It is as if our brains are telling us one story of how the universe works, while our instincts are taking it for granted that it works in an entirely different manner. When we get in a tight spot, however, it is our instincts, the sum total of

our genetics and our individual life experience, that we rely on -- which may be why we are still around to tell the tale.

This is really a dilemma. Which are we to believe, the laboratory-proven, rational observations of math and physics, or an ambiguous but compelling feeling about our surroundings that may insure our survival? Do we have to choose at all? Perhaps the two are not incompatible, if we only viewed them from the right perspective.

Perspective -- where you view the situation from and what information and hardware/software you use to process it -- may indeed be a universally unifying answer. Paul Kammerer surely thought so, as do many researchers and theorists today. Here's an analogy which we will return to repeatedly, a running gag if you will, that sums up a great deal of what Paul Kammerer was up to:

Imagine yourself swimming in the ocean in the midst of a pod of whales: big ones, small ones, moms, dads, and babies. The only evidence you see of them are their dorsal fins above the surface, an occasional rolling back or tail fin, and periodic spouting. From what you see around you, what can you conclude? If you know whales and whale behavior, you can deduce quite a bit. If you had never seen or heard of whales, you might easily be led to some seriously wrong conclusions. As you see the fins appear above the surface, their location appears to be random -- here, there and everywhere, without much pattern. Every now and then two or more will appear and reappear simultaneously in a succession of places. Is it a random occurrence, or is there an underlying causal pattern. Statistically, it would seem to be random, but if you know whales you easily conclude that it is several animals swimming together, perhaps for the purpose of mating, a mother caring for its young, or just companionship, whereas the rest of the fin appearances were random. Even if you didn't know whales, but had the reasonable experience with animals that most of us share, you would probably come to a similar conclusion. By bringing a lifetime of experience to the situation, our human software easily makes the association, but if you were a computer, even a supercomputer, without that background, you would almost certainly conclude on a statistical basis alone that the patterns you saw were random and unconnected.

As a human, the conclusion you made is highly unscientific, however, because it is purely speculative. You don't know exactly why those whales are swimming together, if indeed they are, so you have no right to logically make the conclusion, however correct it may be. Your problem, of course, is you are on the surface and the whales are under the water. Most of the information you need to come to a proper conclusion is simply not within your view. You aren't equipped to see the whole picture. If you were, you would not only conclude that the fins moving together are not random, but neither are any of the other fin appearances, as whales swim together as a whole pod, constantly interacting physically and vocally. More than that, they are also reacting to you splashing about, so some of what you think is random is actually order you are producing yourself without even knowing it. You are haplessly part of the experiment, so to speak. None of it is random -- it is all interconnected, but you simply cannot see it.

Even knowing as little as you do about the situation, you still come up with an instinctual analysis of the matter that is at least partially correct, albeit "unscientific," which is more than a computer can do. Moreover, you don't give it a second thought, any more than seeing three Alaska license plates on the same day. You are used to presuming the rest of the iceberg from its tip, because humans do that sort of thing so well.

Kammerer's world-view is similar: he depicts us as swimming in an infinitely complicated sea of interrelated "sea-monsters," complexes of materials and forces which constantly change in shape and scale, only a small part of which are we equipped to "scientifically" observe or analyze,

but which eons of evolution has prepared us to handle in ways we often do not consciously recognize. It is a universe in which not only no energy or matter is lost, but no information is lost, and which does not run down at the end with a whimper but continually reorganizes itself eternally. Like countless waves crossing in the sea, localized patterns merge, interpenetrate, recombine, resize and then resurface again with subtle changes in a never-ending dance of relatedness and familiarity. Events of the past, long reabsorbed and dispersed, recongeal from their parts in a timely and lawful manner and then go on to transform themselves and once more pass out of our view. We, inseparably in the middle of it all, can only behold it with wonder and join in the dance.

In mapping this universe, he elevates the intuitively obvious to generalized principles and ties them to the most elemental laws of physics, then suggests how they may be tested merely by observing the clusters of events around us. In exploring the unexplained mysteries of events often thought to be mystic or occult in nature, he reveals them to be hidden manifestations of the simplest already-known scientific laws taken out of the laboratory and working within the complexities of real life.

One of the most limiting aspects of our laboratory-style reality of the past few hundred years is our very concept of cause and effect -- we have narrowed ourselves into a corner that forces us to limit and restrict the very nature of what we think to be the difference between physically lawful and totally random. In the process, we have left out much of what we intuitively know and act upon and what earlier thinkers had noted and even codified in the most articulate manner. When we took up the viewpoints of Newton and Descartes, we through out the baby with the bathwater -- the baby being the whole classical Greco-Roman way of looking at the structure of reality.

When we speak of cause and effect these days, we mean something very simple: a moving billiard ball collides with a neighbor and causes it to move according to the physical transfer of energy. That's all there is to it. Cause and effect. Cause happens, effect results. Physical contact is at the bottom line, so we may call it contact causality. If one could trace every contact in the universe back to the Big Bang, all would be perfect order, truly the stuff of the Western age of technology.

This kind of reductionist philosophy is of course the opposite of where modern thinking is trying to go at the moment, but much of the very processes by which we think are still in chains to the older paradigm we are trying to step out of. Contact causality as the whole picture of cause and effect is one of those chains.

What we have limited to one single concept for cause, Aristotle had four of, three of which have been more or less forgotten and yet are essential to the way we experience cause and effect in the real world. What we call cause (contact cause), Aristotle labelled efficient cause, and it is now the only concept we generally think with. But Aristotle had three others: material cause, formal cause, and final cause, all of which widen the understanding of causality and make it closer to what we experience as human beings. Material cause is, simply, the material something is made of. You can't make a silk purse out of a sow's ear, and the Greeks knew it, though some have forgotten it since. The physical stuff of existence in part utterly determines what can happen to it, no matter how you manipulate it. Formal cause is the shapes you find this material stuff appearing in. Some shapes and forms just naturally fall together (or refuse to), no matter what the material or how it is manipulated. The shape of a thing, or a group of things, can ultimately determine what becomes of it and how it operates in its environment. Third, and most subtle, is final cause, which in a word is intent. If something is happening for a purpose, that purpose is a cause as much as material, form, or manipulation. It would seem to be at least anthropomorphic to say that natural events have a

self-conscious purpose. Indeed, it seems at first to be even a religious statement -- God the motivating Intent of the Universe, and so on. But that is not entirely what is meant by final cause. It is, rather, the entire event structure that is as much drawn firmly to its outcome as it in any way seeks it. It is the foregone conclusion leading to the inevitability of a course of events that is simply the result of the inexorability of the individual parts lying where they do and proceeding as they must. Indeed, it is quite the opposite of intent as humans know it, because it involves the interaction of all the factors we cannot see but only dimly feel. When an event is accomplished, we know it could have turned out no other way. That is final cause, and although it allows for interaction as it goes along, we know that ultimately we are prisoners of our insufficient knowledge -- while exercising our free will at one level, we are prisoners of determinism at another.

Kammerer's vision is very much inclusive of these other, older ways of looking at causality, and it allows him (and us) to construct a way of viewing reality that embraces a larger scheme of things than we can have the information to totally see or control in detail. As in swimming with whales, we can see what is happening and be quite functional within the situation without having much specific information to go on at all. As human beings, we are most skilled in just this sort of seat-of-the-pants navigation that is totally unacceptable, on principle, to laboratory-style science. We see the pattern of things unfolding around us, even if we don't have all the details. We know there is more going on than meets the eye, and we don't have to wait to see everything in order to act successfully. There is intuitive logic in events that defy immediate analysis, and we don't let that inhibit us from acting effectively on what are recognizable, if not always explainable, patterns.

We know that the events we are proceeding along in the midst of are happening lawfully and logically, but not always at levels we can recognize. You don't have to invoke magic to explain what you don't specifically understand in detail, particularly if you can make it work for you. From beneath our technical level to perceive and keep track of order around us, we know that we are functioning according to principles of reality structure we intuitively recognize and which are much more subtle and complex than our more simplistic ways of looking at cause and effect.

Yet, nevertheless, they are just that -- a lawful but deep and mysterious kind of cause and effect -- on a level we have yet to successfully label and manipulate in detail.

It is this level of complex physical lawfulness that Paul Kammerer dubbed the Law of Seriality. It is the level of complexity of interaction of information and subtleties of order that is just now being touched on in chaos theory, fractal analysis, and complexity theory. It doesn't operate quite like the simpler levels of efficient, contact cause and effect, but we know it when we see it and we're just now beginning to get a handle on it mathematically, thanks to the advent of computers.

It's not really even a "Law," like the Law of Gravity -- nothing so formal and august. It's just the way things are when life gets complicated at the scale in which we normally operate. What is gratifying about it, is that we intuitively recognize it and it validates us in a truly universal way -- it's more complicated than anybody has previously conceived, and yet we knew it all along! Some kind of sophisticated organism, we...

Of course mysterious coincidences are the first symptom of seriality, like those whale fins sticking up so logically and yet so inexplicably. We know there's a higher level of order here, and the best of us are often quite capable of making use of it, even though we can't explain it.

Paul Kammerer tried to explain it.

Like all good scientists, he started by collecting information and data -- tons of it, years of it, reams of it. Every time he observed an anomaly or coincidence, no matter how small or seemingly unimportant, he noted it and added it to his collection. After that (some twenty years of

collecting), he broke his observations down into an elaborate set of classifications, and finally developed a set of principles consistent with known natural law that appeared to explain the kind of structure he saw. While the likes of Carl Jung were trying to make coincidence link up with psychological and spiritual transcendental structure, Kammerer was just after the facts. No mystery, no personal, emotional interpretation, just data.

From the data evolved his analysis: the proposal of higher-order structure based on systems responding to the simplest Newtonian laws, but at a level one step more advanced than simple contact causality, a level that involved the driving causal principles of structure and information.

First, it was necessary to define the stage of operations, the area we might call the mesoscale, where most human operations are carried out. Neither cosmic or quantum in size, we have our own set of dimensions and complexity with which we pass time and space and where seriality structure principles are operative. This was a difficult observation to make at the turn of the 20th century, as the subatomic and extragalactic dimensions were just opening up to science and it would be a while before it was realized that they work on very different sets of rules than the mesoscale. Kammerer was wise to limit his dimensions.

Then, he proposed some applications of Newtonian physics that may seem intuitively obvious to some today but were a leap of assumption for the time. The first of these, he called persistence. Simply stated, it was inertia at the systems level. Just as a single body tends to maintain its orientation and trajectory, so does a system of bodies and the energies being shared and exchanged by them. It wasn't just the physical interchange that was subject to this principle, but the very material and structure of everything concerned. The material, form, and overall trajectory (final cause?) of any system tended to sustain itself until interrupted by a stronger force, system, or set of systems. Moreover, the longer it persisted, the greater the inertia of the system as it made its space increasingly secure in its environment. Anyone knows a bureaucracy obeys just this sort of law -- but Kammerer suggested that it was not a human artifact, but a natural law to which human organization was subject. If that was the case, the persistence of the details of information structure around us would be the perfect explanation for coincidences -- simultaneous occurrences seemingly unrelated might, in fact, be the results of mutually branching sets of information in the environment long hid from view.

The principle of persistence was a bald-faced denial of entropy -- information, at least, doesn't simply leak out and diffuse away forever into the background environment. It maintains its integrity, but at levels of structure only occasionally accessible to us, and continually resurfaces in recombination with other equally hidden information in the environment. The proposition: a virtual law of conservation of information, a very clinical and structural way of looking at what might be viewed from other standpoints as the Akashic Records or some sort of universal hologram. It's all still there, because it doesn't go away. Pretty simple, actually, and increasingly in tune with new forms of information analysis as far apart as chaos theory and leading-edge thermodynamics.

How does persistence work? This was Kammerer's next question, and for solutions he proposed 1) the imitation hypothesis and 2) the attraction hypothesis.

The imitation hypothesis was simple: things in the same neighborhood, whether physical or informational, tend to become more like one another the longer they are in proximity. This was a general principle that had been around for a long while, though codified on the most rudimentary level in Newton's law of action and reaction, or simple energy exchange and equilibrium. There can be all kinds of reasons for systems in proximity exchanging forces and information and thus becoming more like one another -- gravity, tidal forces, resonance, and the like -- all of them specific. Again, turning things around, Kammerer proposed the principle came first, regardless of

the specifics, which always just fitted in according to their material and formative nature. One of the main features of persistence was, then, imitation and the tendency for energy, information, and structure to transfer from one place to another.

If that was all there was to it, then entropy, or something like it, would have long since taken over and reduced us all to a general state of equilibrium. But with the imitation hypothesis, things could be kept moving in the conditions they actually appear to be. Simply put, like attracts like, so you get clusters of similar stuff here and dissimilar stuff there, the opposite of the imitation idea. Birds of a feather. Kammerer had a serious struggle with this concept, since in the new-found science of electricity and magnetism, it was opposites that attracted. Nevertheless, resisting the temptation to apply his principles to the recently-discovered atomic level, he realized that similar forms and materials do indeed tend to cluster simply by the nature of their shape and physical makeup, providing him with the balance he needed to oppose universal imitation. Thus, persistence was a balancing operation between the principles of imitation and attraction. And, in the process, structural information may get sidetracked or go underground (from our point of view), but all the details remain to surface again later as seeming coincidences which, in fact, are not. Observed data led to hypotheses which subsequently explain the data in the simplest form devisable.

The proof, however, is in the measuring and predicting which such a theory can then produce, and Kammerer was quite unable to provide that, as the blindingly complex nature of the data he was faced with were quite beyond the capacity of his time to organize or analyze.

When Paul Kammerer first proposed his ideas, they were necessarily speculative, as the mathematical theory and the ability to manipulate massive amounts of data needed to substantiate them were not available in 1919. The advent of fractal analysis and chaos theory, along with today's scientific climate that recognizes the need to understand multiple open systems of which the experimenter is a part, have paved the way for a more tangible realization of Kammer's work which is both theoretically mathematizable and experimentally provable.

Perhaps more important than the purely scientific ramifications of Kammerer's work is the fact that it brings previously isolated scientific applications to the level of everyday experience and incorporates the vast, untapped abilities of the human organism to see and recognize what goes on around it as a valid and effective tool in the search for scientific knowledge. Rather than abandoning one road to knowledge in favor of another, it combines the paths we may choose into a broader highway that can take us where we want to go faster, more comfortably, and in better company than any we have travelled heretofore.

If Kammerer's conclusions about the nature of complex systems at the everyday scale are true, the implications are myriad. The whole way we view history and our power (or lack of it) to affect its course will have to be rethought. The very structure of time and space may have to be redepicted, as the concept of final causality and structure-linking though imitation may imply a multidimensional view of time -- one in which, essentially, all dies are already cast, and we just thread our way among them. We try to deal with some of these possibilities in our last chapter -- thinking along the lines of seriality tends to turn the world inside-out, but in the most pleasing and recognizable way.

Although the concepts he evolved are simple in principle, the journey to get there was not. We start with the details of the everyday world which, when collected and classified, led to a remarkable evolution in viewing the structure of reality.

4. Beginnings: The Preponderance Of The Small

*It is only in life that everything repeats itself,
It is only the imagination that is eternally young.
-- Schiller 'To friends'.*

Like most projects, *Das Gesetz Der Serie* did not spring forth full-blown in 1919 but evolved from voluminous sets of small, individual mundane observations that didn't quite seem to fit into the accepted picture of things. Like other observers of the late 19th and early 20th century such as Charles Fort, Paul Kammerer collected environmental oddities and seemingly contradictory trivia. His were not of the truly bizarre type, like frog falls from the sky or mystic appearances and miraculous cures. His were of the most banal description, the little oddities which tend to go by unnoticed until enough are collected to grow into a king-sized mystery.

When he saw strange or unusual juxtapositions of numbers, names, accidents, correspondences, clothing, partnerships, shapes, and forms he duly noted them down and went on about his business as a biologist or musician. Because of his broad cultural background, he probably had a wider number of incidents to choose from (or he simply noticed more), and because of his careful and astute qualities as a scientist, he organized them in a graphic, taxonomical arrangement that showed what they shared in common and where they overlapped or evolved one into another. It was a common approach for the time, used by Linnaeus, Darwin, and many others, but applied to a wholly different area of exploration, or so it seemed. Yet, his eventual conclusions led him to include all sciences within the system, as it universally embraced all reality as we observe it.

First, he observed that seemingly random coincidences were not just individual and unique happenings in themselves, but appeared to be part of a complex structure of related serial events which evolved and developed in tandem along similar and predictable lines. Just the classifications themselves are a monument to the area's complexity and Kammerer's orderly approach to analysis. First, he outlines twenty types of series, examples of where "seriality" commonly manifests itself:

1. Fulfillment of wishes and presentiments
2. Encounters with acquaintances
3. Encounters with characteristic strangers
4. Encounters with typical groups of individuals
5. Things happening at once
6. Coincidental words and thoughts
7. Coincidence of key (in music)
8. Duplication of unfamiliar concepts, successful tests
9. Replication of familiar concepts
10. Coincidental labels
11. Traffic
12. Unfamiliar pathways
13. Games of chance
14. Accidents and small mishaps
15. Skill and failure
16. Sums in buying and selling
17. Names and occupations

- 18. Office records
- 19. Whole situation recurrence
- 20. Order within order

The divisions are not intended to be all-inclusive, but rather anecdotal, to give an overview of where seriality is most frequently to be easily observed. Within these common areas or types of seriality, he further breaks down the order into a morphology, or classification of serial structure:

- 1. A. Simple series (first order).
 - B. Series sequence (higher order).
 - C. Power series (higher degree).
- 2. A. Spatial or simultaneous series.
 - B. Temporal or succedent series.
- 3. A. Dependent series.
 - B. Collateral series.
- 4. A. Pure series.
 - B. Hybrid or mixture series.
- 5. A. Single-rowed series.
 - B. Multi-rowed series.
 - a. Parallel series.
 - b. Polytomous series.
 - aa. Diverging series.
 - bb. Converging series.
 - C. Correlation series.
- 6. A. Segmental or metamerous series.
 - B. Bilateral or symmetry series.
- 7. A. Motion series.
 - B. Rest series.
- 8. A. Quantity series.
 - B. Quality series.
- 9. A. Equivalence or identity series.
 - B. Similarity or affinity series.
- 10. A. Homology Series.
 - B. Analogy series.
- 11. A. Row or direct series.
 - B. Crossing or inverse series.
- 12. Opposition or contrast series.
- 13. Alternating or exchange series.
 - A. Alternating series.
 - B. Cyclic or circular series.
 - a. Cyclical series.
 - b. Phasic series.
 - c. Periodic series.

Kammerer illustrates his categories with abundant examples of coincidences, many of which seem utterly banal and not worth examination, while others are noticeably bizarre. Where

most of us would only notice the spectacular coincidences, Kammerer sees an evolution from the barely coincidental to the powerfully unusual, all connected by a hidden structure. A selection of his examples (listed in parentheses) to which he comes back repeatedly, contained in the Appendix, is worth referring to from time to time for further clarification.

Kammerer sees a lot of suspiciously coincidental goings-on in what seems at first glance a jumble of unrelated phenomena, in what seems, to use his own words, to be very "higgledy-piggledy" indeed. Yet, with his carefully analytic eye, he perceives an order in it, though an order that can get beyond our ability to perceive or measure in only a few short steps. Drawing from his examples, he first summarizes his twenty types of areas where seriality can be frequently and easily observed:

1. Fulfillment of wishes and presentiments:

Just now it occurs to me, there should already be an answer from N. N. whom I asked for some information; considerable time has gone by since I wrote him, so the matter had already gone entirely out of my mind. But now I must remind him. The reminder will be superfluous, though: on the same evening (next morning, with the next mail delivery) N. N.'s letter arrives, if not he himself; or I come upon the missive at the house already, after I thought about it on the way.

The fulfillment of wishes and presentiments, answers to prayers, unexpected yet still hoped for rescue from affliction and danger ("When the need is greatest, God is nearest"), actualization of dreams and daydreams, which then seem to be 'prophetic' (example 31, 32.), are related to this series type. (Compare the further examples 18, 27, 28, 94).

2. Encounters with acquaintances:

I have not seen X. Y. for a year, and --out of sight, out of mind -- we have totally lost contact with one another, in spite of the fact that we always lived in the same locality. Finally, I unintentionally meet him again, and on the very same, or the very next day, a second time, and perhaps a third and fourth time (example 19), before X. Y. once more disappears from sight and thoughts for years.

The first member of this type of series can also be thought devoted to a long forgotten friend (example 23, 25), or a dream of him (then it is nearer to the previously described type no.1); or the first member of the series consists in the fact that I just now have spoken with someone about the friend (example 20); from variations of this serial type there grew the colloquial phrase "Whenever one mentions the fox, he comes running!" Finally, the first serial member may consist of encounters of persons who only resembled the friend (example 18, 22a, 24); or he comes along first, and the series runs on with his double or 'triple' etc.

Just this type of series is very convincing of the wide reaching actuality of the seriality principle. I at least have had the experience that a serial supplementary part for an encounter which seems isolated is usually found upon reflection. For examples 18 and 20 I first became aware of this after the fact. One reconsiders the matter in the context of encounters or other random events, thus: where is its duplicated member, where have its possible further multiples remained? In this one takes care to accept only strikingly manifold cases, and if one should really recall none, then he waits for them.

3. Encounters with characteristic strangers:

The converse to series type no.2: An unknown whose appearance attracts my attention persistently encounters me from now on for some time. The encounters are independent of place

and hour: I can stroll where and when I will, I can move along my accustomed beaten track or not - the same man always crosses my path.(Example 61)

4. Encounters with typical groups of individuals:

At times it is not one and the same individual that constantly crosses my path in the way described, but instead it is groups of individuals, who join themselves to my life unified through a conspicuous feature: I have days where everywhere cripples, sick people, children breaking out in scales and carried by women, people in mourning clothes, or the like encounter me. Another time I will be incessantly asked about something, sometimes about the time, sometime about directions -- and my haste is to no avail; not once, even if I take a running step, is the questioner scared off. Such a series type resolves into subtypes, perhaps the type 'questioner' can realize itself in the form that many passers-by ask about different things, but all more or less at in a bunch; or that all ask separately but about the same thing.

One and the same city can, crossed on different days, acquire a fundamentally different aspect, as a result of experiencing serial encounters: one time it is capable of awakening the impression of a wonderfully beautiful place, another time, of being inhabited by a fundamentally ugly race of men. Anyone who sits in an office, uses means of transportation, or visits restaurants or coffeehouses will likewise confirm that many times fat people, emaciated ones, giants, dwarfs, those similar in physiognomy, hoarse people, the hard of hearing, glasses wearers, those hauling wrapped packages etc., etc. put in an appearance in especially great numbers.(Example 55)

5. Things happening at once:

One observes a counter, perhaps a ticket dispenser for the train, a sales stall, a theater box-office, cash-desk or information desk in a bank or office and will for the most part perceive that the people either crowd together or that the counter remains empty for a long time. In the first case the much harassed person, who has to hold his ground against the assault, readily declares "Everything is closing in on me!" The same phenomenon applies to paths and streets, on which whole columns of pedestrians or wagons respectively pile up; but in the next moment they can just as soon lie there almost lifeless again (example 73).

Allowing obvious causes, like arrival and departure of trains, beginning and ending of the work day, etc, is not sufficient to explain away all the interrupted clusterings of inactive intervals. One senses, as one of the members included therein, how hard it is to get rid of the company.

[Note: A similar experience today is sudden traffic congestion on isolated stretches of interstate highway without an accident or rush hour to explain it -- a common, though mysterious, occurrence.]

6. Coincidental words and thoughts:

Just now a person present in my company gives voice to a word, a sentence, thoughts, a melody, which just at that moment or shortly before, came into my mind in another way than it could have occurred to him(examples 7, 33, 34, 76).

Concurrences of such a kind, namely the coincidence of thought words of one with the spoken words of the other easily suggests in the former that the latter could divine his thoughts; or awakens in both the belief that they are to a rare degree two souls 'tuned to same pitch'. Against the serial nature of the concurrence it will be objected that persons exposed to a similar situation are likely to come up with similar words or thoughts. Certainly this associative explanation will many

times be pertinent, although it allows little margin for the different preexisting contents of consciousness and susceptibilities of the companions; but there are situations in which it is entirely inapplicable. When an uncommon word, which I just now read in the newspaper, in the same moment becomes audible from the mouth of someone in the next room (example 64), then similar associations can not be held responsible for it. Also in the following case, where a lifeless mechanism is able to play the role of one of the partners 'tuned to the same pitch', then it can not be answerable; I adduce the following case as a special type:

7. Coincidence of key (in music):

I play the piano, the church bells chime in, and it is the same key as my piano piece. A barrel organ, a gramophone, an instrument or voice can perform the same piece in the same neighborhood (example 38) or even start off in consonant intervals, so that, from my playing and that of the other, a nearly harmonious contrapuntal-symphonic work grows up. In the extreme case even the exact same piece, say, that I just began is played in the house across from me (example 37); in order to serve as a proving ground of seriality, it goes without saying that it may not be a widely popular tune at the time.

8. Duplication of unfamiliar concepts, successful tests:

Today I hear or read of a thing which up till now had lain strange and far from me; perhaps a concept, of whose existence I have had no idea, or which at any rate I seldom thought about, steps into my consciousness. But now this entrance repeats itself at close intervals of time, perchance on the same day or in the same hour. A rare sight, an unusual picture can immediately show up in such a manner yet again (example 4, 5, 6, 21, 22b, 33, 36, 40-42, 65).

This series type often serves the school student in good stead: he may count on the fact that what he just now learns for the first time immediately finds very good opportunity for application. In tests the students have the 'luck' of straightaway being questioned on something read a short time earlier, while half forgotten things and totally unstudied material most pleasantly does not seem to have the same attraction for the examiner. Were it different than this, far fewer could honestly pass an examination. An amazing example of similar nature befell me on January 22, 1906, after I had gone through the 50th lesson (reflexive pronouns) in Plate's primer of the English language. In the very same hour I read in Jerome, 'Diary of a Pilgrimage' page 41, paragraph 4, wherein immediately and many times the vocabulary and rules newly learned just then in Plate found such application as if this place of Jerome had been written expressly as linguistic exercise for the 50th lesson of Plate.

9. Replication of familiar concepts:

Familiar things are capable of attaining, through a temporal clustering out of the ordinary, an omnipresent power over my consciousness. Then it is not their individual appearance that is special about them, but rather their mass occurrence. A name, a number, a drawing can stand on all sides before my eyes in a short time in placards and in newspaper inserts, on the street and in the pub, not even excepting my own house, and in spite of its inconspicuousness be very striking (example 80).

10. Coincidental labels:

The signal plates marked with letters, numerals or colors, through which the passengers of the metropolitan streetcars are informed about the destination of the train or buses passing by at any

given time, allow us to suspect a series type in the following phenomenon. He who crosses the streetcar lines or waits at one of its stops must perceive that, more often than one would suspect, two buses labelled alike pass by one another in opposite directions. The cause cannot lie in the dispatching of the traffic, perhaps in the fact that identical cars are sent off simultaneously from the terminals -- the nonuniformities, delays, etc. occurring while underway would have to interfere with the prompt concurrence of vehicles crossing one another again at the stop. The phenomenon is so widespread that I, catching sight of an H-bus coming from downtown, can look around in the sure expectation that there will likewise be at an H-bus arriving from uptown at that moment -- and this along a stretch which is travelled by at least half a dozen other lines.

11. Traffic:

There is also the type exemplified by a lucky chance with a streetcar or, as the case may be, traffic in general. I catch the metropolitan railway, which brings me early in the morning out of the suburb into the inner city, cutting it so close that I can just get to the footboard when it starts to move. So it remains now for the the entire day: if I have to change anywhere, then it is just barely possible for me to breathlessly make my connection. But even if I trade the train for the motorbus or the tram the razor fine, perfectly timed arrival is renewed. Another day in my same routine I am in no way able to duplicate the experience: instead, the train always rides away before my very nose, and I have to wait for a long time.

12. Unfamiliar pathways:

Errands and strolls, shopping as well as recreation, help us get acquainted with a series type which centers on the fact that paths and localities that one traverses, on which one lingers, almost acquire the power and attractive force of an enchanted zone; as by magic it comes to pass that one has to travel back there once more on the same or successive days. The most suitable as examples are obviously places and paths, or combinations of such, which do not belong to our usual route. Today I have been in a cafe which as a rule I am never in the habit of frequenting -- doubtless there will be another occasion as soon as tomorrow, another necessity to betake myself to the same place again.

If the paths and locales are to some extent full of traffic, then I can trace the serial law to other men who also succumb to the serial connection between persons and place, so I then run into the same people there. But how to determine whether a locality that was unfamiliar to me does not belong to the routine of others? For such a distinction there are two possibilities: either they are acquaintances whom I meet, and they confirm to me that their presence here is also unusual, and my meeting them here is also surprising to them (example 26); or the meeting place guarantees the fact that the random people I see do not regularly belong here -- for example, cityfolk on picnics whom I rediscover at the same intersection after both parties in the meantime had to have made an entirely different excursion in opposite directions (example 61) Among manifold examples here is only one: Sunday May 20, 1917 I met at the junction of Gaheistreet with Archbishop Street (Vienna) the same party of walkers who were otherwise unfamiliar to me after an interval of three hours, which I had spent on the Himmelhof, they probably on the surrounding lawns alongside the wall of the Lainzer zoological gardens.

13. Games of chance:

Similarly, just as before a single man recurs in the same district of a city, the ball in a game of roulette is deflected in successive rolls of the game to the same place, as if attracted by it, so that

red, black or even definite individual numbers obstinately repeat themselves. Marbe (in his work on the "Uniformity of the World") has noticed at Monte Carlo and at Biarritz among other casinos series of as much as ten identical members; which seems quite enough to me to justify Marbe's view that the possibility of a so-to-speak "system" is no absurdity. He who will first be able to make use of the system of seriality at the gaming table, no game-bank in the world will be able to withstand! It goes similarly with all games of chance as it does for roulette, the Lottery not excepted; it also goes similarly, according to Marbe, for bets and accident insurance; he who once had an accident more likely has a new one (examples 47, 48, 52).

14. Accidents and small mishaps:

Seriality comes to light not only in large accidents requiring insurance (example 68), but also in quite small, ridiculous mishaps. Did your tooth-brush slip from you this morning and fall into the dirty water of the washbasin or bucket? Trust me, the same thing will happen tomorrow morning! Did you hurt yourself in today's early morning darkness in dressing by striking your head or knee against the corner of your chest? Take heart the bruise will still not be properly in bloom, and already you may receive a new contusion on the same or a neighboring place on the body, if anything from the same treacherous piece of furniture! (Example 80)

15. Skill and failure:

The same kind of thing is not limited to "chance," or to our "good luck" -- thus not just to games, large (Type 13) and small accidents (Type 14). It also extends to happenings that we think we master with the help of our "skill." Games of sport and teams, in which everything or nearly everything should be dependent on the adroitness of the players, nevertheless show serial-type interchanges of the successful with the unsuccessful. In target practice, ball games of all kinds, etc. we have ample opportunity to ascertain this. Only here purely causal possibilities for explanation -- fatigue of the players or heightened insecurity after an initial miss -- are much closer and more applicable than in pure games of chance.

16. Sums in buying and selling:

Often the totals to be expended or taken in in buying and selling acquire serial form, in the way that example 3 demonstrates. I heard sellers call out, "Remarkable, tonight everything amounts to 12,60 Kr.," and so on, when several customers who had bought several and entirely different things always reached the same total.

17. Names and occupations:

Names and profession often assume serial connections. Every address and telephone book, every appointment and business calendar gives a wealth of examples, of which, as entirely random findings which here serve only for vividness, let there be named the champions of the peace movement Dr. ALFRED H. FRIED and [State Minister] O. UMFRID; the [vehicle owner] ANTON FUHRMANN in Vienna XIII/6, Linzer Strasse, and the shoemaker ANTON ALOIS SCHUSTER in Innsbruck, Kiebachgasse 10. (Naturally both the last ones are ordered here again exactly in the series ANTON-ANTON!)

[This one only works in German. We see similar examples in English such as the oft-repeated joke that the general in charge of trying to retain more territory under Western influence during the Vietnamese War was named Westmoreland.]

18. Office records:

In every bureaucratic life there is a very familiar phenomenon, that certain findings crowd together in narrowly restricted intervals of time. In the serial structure of consistently frequent or usually rare events, there exists only the difference that the former must first become unusual through extraordinary numbers in order to attract notice as series, while the latter already give themselves to be understood as series with a few temporally adjacent or coincident repetitions.

A case of the first-named kind is the extraordinary frequency of incapacitation proceedings that distinguished November and December 1916 according to District Judge Dr. Rud Gutmann. Two cases of the last-named kind I owe among others to the District Chief Edgar Ritt. von Widersperg: of six petitioners who applied on February 7, 1915 for a definite grant, there were no fewer than two technicians at the same time sons of barbers. On October 10, 1912, this same district chief had -- for the first time in his life -- written privately to the minister of Wollenitz; on the same day he came into his office, and found an action from Wollenitz on his writing desk, which had never happened before then. Wollenitz is a small village in Bohemia, from which certainly no stream of actions moves itself into the Viennese Statthaltereie. During my military service in a position of postal censorship I daily had opportunity to observe the most surprising series; I regret not being able, on the basis of official secrets, to enumerate them individually in the collection of examples. They may be generalized into the fact that in a daily arrival of around 100,000 letters written in Italian, which get read by say 200 censors divided into 5 censor-groups, it always happens that letters from the same correspondents come to the hands of the same censors. Also found together were distinctly constituted peculiarities of the correspondence -- a conspicuous address, a peculiar expression, a writing in dialect, a code, and so on. If one discussed just one case, how it happened only once among perhaps millions of postal pieces at any given time, then certainly another censor would come and bring with him a supplement or counterpart, a parallel or control case. The previously mentioned E. v. Widersperg, who was assigned to the telegram censor in the World War, as I was to the letter censor, confirms for me that entirely analogous things were reported there all the time.

19. Whole situation recurrence:

The types explained up till now depict the course of series as if always only one event of the momentary situation repeated itself. But sometimes the whole of the situation repeats itself or at any rate multiple components of the situation recur conjointly.

"It is just like before," one then hears those people say, who live through the same thing and are surprised that a coincidence of events so plainly recognizable recurs. This correlative coincidence readily results in regular intermediate spaces, perhaps in yearly periods -- "this happens every May". Sometimes the components repeat themselves, but with mutual displacement, so that now the one, now the other component that originally entered at the same time, onsets with a temporal displacement. Here the former whole situation may suffer distortion to the point of unrecognizability, in spite of the fact that it nevertheless finally recurs in all its parts.

The circular course of the seasons with all their accompanying phenomena is the greatest kind of example of this. But we recognize it no less in the trifles of life: rambles with the same goal and under the same domestic and social conditions (example 36) are often unintentionally nearly on the same date of a consecutive year. Disregarding these temporal connections (of the occurrence with the periodic interval), the recurrence also inclines to local conditions: visitors who are not mutually acquainted always meet together in the same family, the same theater, the same museum and so on, notwithstanding the fact that they are in no way guests or habitues there (Examples 26

and 61). Conversations and other incidents are correlated with the place where they took place for the first time: H.W. went walking with M.R. in an alley of the palace gardens; two years later not merely was the same walk repeated, but at the same place both suddenly remembered having spoken at that time on the same theme on that very spot.

20. Order within order:

A series type (example 16) is definitely established in the arising of an "order in the order." Suppose I arrange some items by kind; while I am occupied with them, I remove them here and there, some of them come to lie next to each other according to size. Or I sort a material according to contents, but the keywords have been grouped alphabetically in parts without my assistance. My newest experience of this is the following: conspicuous passages in letters, which arrived at the censorship office, were grouped with labels for the sake of the report; if the original letters were necessary for comparison, then they were attached with paper-clips to the labels, the whole material thereupon mostly geographically, sometimes alphabetically, ordered according to place of posting, most rarely alphabetically according to name of sender. In all three cases the report-labels (being in the least number) with their attached originals now divided themselves not nearly uniformly among the unaccompanied labels; thus instead of grouping themselves individually among the very numerous loose labels as one would expect, they were found together in small piles. In this manner the supply of notes, arranged according to such otherwise different fundamental principles of order, was ordered independently, though naturally incompletely, in two spontaneous groups: note-label with and without original evidence.

Nevertheless, if the spontaneous ordering agrees with the ordering principle I have imposed on things; if I order them thus (causally) quantitatively and they "themselves" (serially) also quantitatively (not qualitatively) or, on the other hand, they themselves and I myself order them qualitatively (not quantitatively), then it gives the illusion that objects came toward me in an almost unearthly way, as if goblins helped me in my work.

With the 20 series types just enumerated there has obviously only been given an arbitrary selection of likely or common types. Furthermore, this selection is necessarily chosen from the one-sided, professional and otherwise special standpoint of the life experience of its author, while entirely different compilations would have to result from the standpoint of every other profession and individual existence. There would easily be found medical, juridical, technical, commercial, literary, athletic, and ministerial series types. Also the mention of the law of series in the daily press speaks at times of the 'series law of criminologists' (example 53), while somewhere else it will again be designated as 'of medical superstition' (example 44b), etc. I now think that it was perhaps not necessary to fetch series types from all those different areas as was attempted in the series examples, and to fashion the form of typical series incidents more variously through that, as it is possible from the perspective of any individual life and profession to provide many more.

But he who thinks that human everyday existence is unsuited to illustrating physical and philosophical truths, that in its unscientific paltriness, yes, at times in its absurdity, it is unworthy and for that reason digressive for such a task: he still tarries in the fool's paradise of a mystical privileged position of man in the All. He has still not grasped that all experience of man -- what happens to him externally and what stirs in his innermost secret compartments, what he does and provides for, thinks and orders -- must ultimately be resolvable into simple physical processes. Events of our lives, which for the human consciousness seem far removed from the processes of

our laboratories, indeed opposite to them, are in reality only serial clusterings of these processes and in their high-ordered union are syntheses of the simple ones that are not so easily recognizable, not immediately analyzable into their fundamentals.

In his wrap-up of his twenty types, Kammerer emphasizes two major points that recur in much more developed form later:

First, he points out that this set of types are native to the particular observer, namely himself, and might change with another observer's viewpoint. In essence, the observer is looked at as a part of the system, integrated with it and inseparable from it. Quantum physics also has at its heart the understanding that the observer necessarily interferes with the experiment. Its reaction, however, is to pull back and base its conclusions on probability, abandoning involvement in the experiment on principle. Kammerer does the opposite -- he says get in there and swim around and note what you see, something you can more easily do in the everyday world which Kammerer invokes as science's neglected domain.

Second, he reiterates the classical concept that everything has a simple cause (or a very great and complex compilation of simple causes) and our mysteries arise from our inability to keep track of what is going on, so that what appears as accidental or random is really due only to ordinary causes we cannot observe. In no way was he suggesting a new "acausal" principle as Jung and Koestler imagined. He was as hard-nosed a materialist scientist as they come, except that he was willing to admit the inabilities of science to fully observe all the necessary phenomena to explain everything. Mainstream science would have to wait half a century until the dawn of chaos theory to recognize that there were hidden patterns in what had previously been dismissed as fundamentally random data. Kammerer, like Einstein, clearly believed that "God does not play with dice." No wonder the great physicist liked Kammerer's book.

If the areas where seriality abounded were less than definitive and very observer/participant based, Kammerer's morphology of the different structures that seriality displayed were more mathematical and self-defining, more universally applicable. The varying structures of seriality are simple in their essence, but as individual components in an event begin to move about, switch on or off, or transpose, the resulting picture can get quite dizzying, as Kammerer only begins to suggest in the somewhat blinding diagram A, which illustrates his first classification:

I. A. Simple series (first order). A repetition of the same or similar things done twice or more than twice. Examples: 1, 3, 4-11, 15, 17-21, 23-25, 27, 28, 30-41, 43, 45-47, 49-54, 56-58, 60-63.

B. Series sequence (higher order). A combination of two or more simple series in which one of their features (transverse component) is always taken over into the series that follows and is repeated there. Examples: 2, 12, 14, 16, 22, 29, 44, 48, 55.

C. Power series (higher degree). All of the series of the first order that issue from a common series as their origin by means of a changeover of components.

Ausgangsserie		Anhangs- oder Nebenserie			
Serie 1. Ordnung (1. Potenz)	Serie(n) 2. Ordnung (3. Potenz)	Serie(n) 3. Ordnung (6. Potenz)	Serie(n) 4. Ordnung (12. Potenz)	Serie(n) 5. Ordnung (24. Potenz)	
I $\begin{pmatrix} a_1 \\ b_1 \\ c_1 \end{pmatrix}$ II $\begin{pmatrix} a_2 \\ b_2 \\ c_2 \end{pmatrix}$ III $\begin{pmatrix} a_3 \\ b_3 \\ c_3 \end{pmatrix}$	IV $\begin{pmatrix} a_4 \\ d_1 \\ e_1 \end{pmatrix}$ V $\begin{pmatrix} a_5 \\ d_2 \\ e_2 \end{pmatrix}$ VI $\begin{pmatrix} a_6 \\ d_3 \\ e_3 \end{pmatrix}$	VII $\begin{pmatrix} d_4 \\ l_1 \\ k_1 \end{pmatrix}$ VIII $\begin{pmatrix} d_5 \\ l_2 \\ k_2 \end{pmatrix}$ IX $\begin{pmatrix} d_6 \\ l_3 \\ k_3 \end{pmatrix}$	X $\begin{pmatrix} j_1 \\ v_1 \\ w_1 \end{pmatrix}$ XI $\begin{pmatrix} j_2 \\ v_2 \\ w_2 \end{pmatrix}$ XII $\begin{pmatrix} j_3 \\ v_3 \\ w_3 \end{pmatrix}$	XIII $\begin{pmatrix} v_4 \\ w_1 \\ y_1 \end{pmatrix}$ XIV $\begin{pmatrix} v_5 \\ w_2 \\ y_2 \end{pmatrix}$ XV $\begin{pmatrix} v_6 \\ w_3 \\ y_3 \end{pmatrix}$	
		VII $\begin{pmatrix} e_4 \\ l_1 \\ m_1 \end{pmatrix}$ VIII $\begin{pmatrix} e_5 \\ l_2 \\ m_2 \end{pmatrix}$ IX $\begin{pmatrix} e_6 \\ l_3 \\ m_3 \end{pmatrix}$	X $\begin{pmatrix} k_4 \\ x_1 \\ y_1 \end{pmatrix}$ XI $\begin{pmatrix} k_5 \\ x_2 \\ y_2 \end{pmatrix}$ XII $\begin{pmatrix} k_6 \\ x_3 \\ y_3 \end{pmatrix}$	XIII $\begin{pmatrix} x_4 \\ a_1 \\ b_1 \end{pmatrix}$ XIV $\begin{pmatrix} x_5 \\ a_2 \\ b_2 \end{pmatrix}$ XV $\begin{pmatrix} x_6 \\ a_3 \\ b_3 \end{pmatrix}$	
		VII $\begin{pmatrix} e_4 \\ l_1 \\ m_1 \end{pmatrix}$ VIII $\begin{pmatrix} e_5 \\ l_2 \\ m_2 \end{pmatrix}$ IX $\begin{pmatrix} e_6 \\ l_3 \\ m_3 \end{pmatrix}$	X $\begin{pmatrix} l_4 \\ z_1 \\ A_1 \end{pmatrix}$ XI $\begin{pmatrix} l_5 \\ z_2 \\ A_2 \end{pmatrix}$ XII $\begin{pmatrix} l_6 \\ z_3 \\ A_3 \end{pmatrix}$	XIII $\begin{pmatrix} z_4 \\ c_1 \\ l_1 \end{pmatrix}$ XIV $\begin{pmatrix} z_5 \\ c_2 \\ l_2 \end{pmatrix}$ XV $\begin{pmatrix} z_6 \\ c_3 \\ l_3 \end{pmatrix}$	
		VII $\begin{pmatrix} e_4 \\ l_1 \\ m_1 \end{pmatrix}$ VIII $\begin{pmatrix} e_5 \\ l_2 \\ m_2 \end{pmatrix}$ IX $\begin{pmatrix} e_6 \\ l_3 \\ m_3 \end{pmatrix}$	X $\begin{pmatrix} m_4 \\ B_1 \\ C_1 \end{pmatrix}$ XI $\begin{pmatrix} m_5 \\ B_2 \\ C_2 \end{pmatrix}$ XII $\begin{pmatrix} m_6 \\ B_3 \\ C_3 \end{pmatrix}$	XIII $\begin{pmatrix} B_4 \\ l_1 \\ l_1 \end{pmatrix}$ XIV $\begin{pmatrix} B_5 \\ l_2 \\ l_2 \end{pmatrix}$ XV $\begin{pmatrix} B_6 \\ l_3 \\ l_3 \end{pmatrix}$	
		VII $\begin{pmatrix} e_4 \\ l_1 \\ m_1 \end{pmatrix}$ VIII $\begin{pmatrix} e_5 \\ l_2 \\ m_2 \end{pmatrix}$ IX $\begin{pmatrix} e_6 \\ l_3 \\ m_3 \end{pmatrix}$	X $\begin{pmatrix} B_4 \\ D_1 \\ E_1 \end{pmatrix}$ XI $\begin{pmatrix} B_5 \\ D_2 \\ E_2 \end{pmatrix}$ XII $\begin{pmatrix} B_6 \\ D_3 \\ E_3 \end{pmatrix}$	XIII $\begin{pmatrix} D_4 \\ m_1 \\ n_1 \end{pmatrix}$ XIV $\begin{pmatrix} D_5 \\ m_2 \\ n_2 \end{pmatrix}$ XV $\begin{pmatrix} D_6 \\ m_3 \\ n_3 \end{pmatrix}$	
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	IV $\begin{pmatrix} c_4 \\ h_1 \\ l_1 \end{pmatrix}$ V $\begin{pmatrix} c_5 \\ h_2 \\ l_2 \end{pmatrix}$ VI $\begin{pmatrix} c_6 \\ h_3 \\ l_3 \end{pmatrix}$	VII $\begin{pmatrix} h_4 \\ r_1 \\ s_1 \end{pmatrix}$ VIII $\begin{pmatrix} h_5 \\ r_2 \\ s_2 \end{pmatrix}$ IX $\begin{pmatrix} h_6 \\ r_3 \\ s_3 \end{pmatrix}$	X $\begin{pmatrix} P_4 \\ H_1 \\ J_1 \end{pmatrix}$ XI $\begin{pmatrix} P_5 \\ H_2 \\ J_2 \end{pmatrix}$ XII $\begin{pmatrix} P_6 \\ H_3 \\ J_3 \end{pmatrix}$	XIII $\begin{pmatrix} H_4 \\ h_1 \\ i_1 \end{pmatrix}$ XIV $\begin{pmatrix} H_5 \\ h_2 \\ i_2 \end{pmatrix}$ XV $\begin{pmatrix} H_6 \\ h_3 \\ i_3 \end{pmatrix}$	
		VII $\begin{pmatrix} h_4 \\ r_1 \\ s_1 \end{pmatrix}$ VIII $\begin{pmatrix} h_5 \\ r_2 \\ s_2 \end{pmatrix}$ IX $\begin{pmatrix} h_6 \\ r_3 \\ s_3 \end{pmatrix}$	X $\begin{pmatrix} Q_4 \\ K_1 \\ L_1 \end{pmatrix}$ XI $\begin{pmatrix} Q_5 \\ K_2 \\ L_2 \end{pmatrix}$ XII $\begin{pmatrix} Q_6 \\ K_3 \\ L_3 \end{pmatrix}$	XIII $\begin{pmatrix} K_4 \\ u_1 \\ v_1 \end{pmatrix}$ XIV $\begin{pmatrix} K_5 \\ u_2 \\ v_2 \end{pmatrix}$ XV $\begin{pmatrix} K_6 \\ u_3 \\ v_3 \end{pmatrix}$	
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		VII $\begin{pmatrix} h_4 \\ r_1 \\ s_1 \end{pmatrix}$ VIII $\begin{pmatrix} h_5 \\ r_2 \\ s_2 \end{pmatrix}$ IX $\begin{pmatrix} h_6 \\ r_3 \\ s_3 \end{pmatrix}$	X $\begin{pmatrix} u_4 \\ T_1 \\ U_1 \end{pmatrix}$ XI $\begin{pmatrix} u_5 \\ T_2 \\ U_2 \end{pmatrix}$ XII $\begin{pmatrix} u_6 \\ T_3 \\ U_3 \end{pmatrix}$	XIII $\begin{pmatrix} T_4 \\ n_1 \\ o_1 \end{pmatrix}$ XIV $\begin{pmatrix} T_5 \\ n_2 \\ o_2 \end{pmatrix}$ XV $\begin{pmatrix} T_6 \\ n_3 \\ o_3 \end{pmatrix}$	

A ↑

In diagram A, things start out simple and very soon become horrendously complex. In the first series on the left (Serie 1), there is simple repetition of an event with three components a, b, and c. It could be, for example, on day one(I) you run into a strange man(a) wearing a Tyrolean hat(b) and carrying a brass-headed walking stick(c). Nothing of note. On day two(II), it happens again -- same guy, same hat, same stick. An interesting coincidence. On day three(III), there he is again. Is he following you, or what? Day four(IV), you see him again for the fourth time(a4), but he's wearing a bowler(d1) and carrying an umbrella(e1). The coincidence-series is over. Or is it? Just down the block you spot a different guy(f1) who's wearing a Tyrolean hat(b4) and carrying a briefcase(g1), and around the corner there appears a fellow(h1) wearing a fedora(i1) and carrying a brass-headed walking stick(c4)! Your original experience has split into three. Two more times(V, VI) you see all three in this new form, and then each of those transforms into two different versions

with shared elements -- canes, umbrellas, sticks, various hats, and who knows what else. By the fifteenth repetition, what you see may not appear to noticeably resemble your first coincidence, yet it is directly linked.

B →

Zweivorhergehende Serie (-2)	Erstvorhergehende Serie (-1)	„Ausgangsserie“ des Schemas S. 57 (+1)
$-V \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix} -IV \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix} -III \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix}$	$-II \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix} -I \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix} 0 \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix}$	
$-V \begin{pmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{pmatrix} -IV \begin{pmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{pmatrix} -III \begin{pmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{pmatrix}$	$-II \begin{pmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{pmatrix} -I \begin{pmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{pmatrix} 0 \begin{pmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{pmatrix}$	
$-V \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix} -IV \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix} -III \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix}$	$-II \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix} -I \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix} 0 \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix}$	$I \begin{pmatrix} a_1 \\ b_1 \\ c_1 \end{pmatrix} II \begin{pmatrix} a_2 \\ b_2 \\ c_2 \end{pmatrix} III \begin{pmatrix} a_3 \\ b_3 \\ c_3 \end{pmatrix}$
$-V \begin{pmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \\ \tau_4 \end{pmatrix} -IV \begin{pmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \\ \tau_4 \end{pmatrix} -III \begin{pmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \\ \tau_4 \end{pmatrix}$	$-II \begin{pmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \\ \tau_4 \end{pmatrix} -I \begin{pmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \\ \tau_4 \end{pmatrix} 0 \begin{pmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \\ \tau_4 \end{pmatrix}$	
$-V \begin{pmatrix} \omega_1 \\ \omega_2 \\ \omega_3 \\ \omega_4 \end{pmatrix} -IV \begin{pmatrix} \omega_1 \\ \omega_2 \\ \omega_3 \\ \omega_4 \end{pmatrix} -III \begin{pmatrix} \omega_1 \\ \omega_2 \\ \omega_3 \\ \omega_4 \end{pmatrix}$	$-II \begin{pmatrix} \omega_1 \\ \omega_2 \\ \omega_3 \\ \omega_4 \end{pmatrix} -I \begin{pmatrix} \omega_1 \\ \omega_2 \\ \omega_3 \\ \omega_4 \end{pmatrix} 0 \begin{pmatrix} \omega_1 \\ \omega_2 \\ \omega_3 \\ \omega_4 \end{pmatrix}$	

We began with an arbitrary starting place, however, which made it much simpler than it really is. Diagram B is a modest effort to show that we reached that starting place as a result of other elements shuffling themselves along until we showed up at that place and time. In fact, one could start at any one of the modules in diagram A and go off in any direction and still find things to be connected. Wherever you are, things are moving in all directions, overlapping and developing both in time (longitudinally, left to right in the diagram) and space (transversely, up and down in the diagram). You, of necessity, are always in the middle of it all, confused by the blinding complexity of it all, yet sensing there is some sort of order here if only you could pull back, God-like, enough to see it. Kammerer expresses it well:

Above all, the table illustrates how the stream of serial events continues in such a manner that any one of the features (transverse elements) of the series that is seen as the point of departure in each case is always taken as a point of origin for the further series following upon it; as we expressed ourselves earlier, it has been picked up as though it were a keyword--as the keywords of a dramatic dialogue, the serial chain interweaves each transitional element even further. The single chain of members breaks off a certain amount of time after it has been included into dependent series; whence a later continuation no longer contains any features that it still had in common with its respective departure series..... Therefore, it is only through the intermediate members that the single series standing distantly from one another have joined into the collective union. Without the continuance of the intermediate members their transformation would hide the serial connection from an observer; the beginning and progression of a run off of series would be left to appear as simple series independent of one another.

From both tables we learn how the serial process takes possession of a whole stream of occurrences; how this stream, with grandiose uniformity yet infinite variety, carries away the events as similarly formed yet variegated pebbles, and also grinds them up against one another so that they become increasingly all the more uniform. Furthermore, to our eyes, the stream of the serial occurrence, whether it now engulfs the table in the book or reality itself, seems to welter, increasing step by step in breadth also; in fact it takes in quite uninterruptedly the full breadth and depth of existence. Because what we have taken as a simple departure series signifies nothing

more than our conceptual abstraction: the 'departure series' is first of all only an arbitrarily captured section of being; secondly a stage in the whole series-sequence which in no way stands at a true beginning--on the contrary, a step to flow into the already countless preceding single series and series-sequences.

Another way of seeing this sort of multilayered, interconnected reality comes from another of Kammerer's images and one of his fundamental analogies, that of crisscrossing waves of events and event components:

...not only the world view of an irregular phenomenal driving-together and driving-apart of things, as experience presents it; but also, in their reduction to waves, their most general and concise description. The flat stone, which--thrown horizontally on the water--skips up and dances a 'series' on the surface of the water may serve as a model. But everywhere that it falls down, this self-repeating event always excites the water waves as a new series, which is propagated circularly in all directions from the place of the disturbance...

Kammerer sees seriality (which by now define as coincidence that really isn't) as a phenomenon in space as well as time. Similar events may happen one after another or all at the same time and be equally connected by seriality without any traceable causality. What connects them is that they are driven along together by the inertia of the larger systems that contain them, the qualitative and quantitative vectors, so to speak, that describe the overall motion of the local event-complex. The idea that although, for instance, you have never seen the three strangers or encountered their particular items of apparel before, you are nevertheless connected with one another and are integral parts (sticks, hats, briefcases, umbrella, people and all) of a local system that include these components and much more. One of the main assumptions upon which the concept of seriality rests is that complex systems of the size that make up our everyday reality operate under a special set of "secondary laws" (to paraphrase physicist Arthur Eddington) that extend the primary laws of physics we are familiar with to another level of operation. Along this line of thinking, simple passive inertia in a single object becomes an active persistent energy in a larger system (as Einstein also looked at it), and tandem complexes of events borrow from each other's form and activity in a way that simple next door objects do not.

This in a nutshell is the subject of the next three chapters on the theory of seriality, but before getting on to them, a look at the rest of Kammerer's classifications, the structures through which he is asking us to view events.

II. A. Spatial or simultaneous series. Repetition and combination resulting in the members being next to one another. (Examples: 10, 64, 77.)

B. Temporal or succedent series. Repetition and combination resulting in the members being after one another. (Examples: 65, 76.)

Two sides of the same serial coin. Events may happen one at a time in order, or they may happen all at once.

III. A. Dependent series. Time series branching off from a given origin series and connected with it through common intermediate components. (Examples: 2, 12, 14, 16, 22, 29, 44, 48.)

B. Collateral series. Space series branching off from a given origin series and connected with it through common intermediate components.

This is just the time and space version of events which are connected by shared elements.

IV. A. Pure series. Only features of a single kind of series are evident.

B. Hybrid or mixture series. Features from more than one of the kinds of series are evident. (Examples: 70-72.)

...mixed series are, naturally, the more common occurrence.

V. A. Single-rowed series. In the serial things or events only one repeating element (common feature of the repetition) is present. [e.g., only the Tyrolean hat repeats]

B. Multi-rowed series. Two or more common features (transverse components of the series) turn up in the repetition. (Examples: 45, 53.) [e.g., Tyrolean hat and walking stick both repeat]

a. Parallel series. All transverse components remain uniformly beside one another. [guy, hat, and stick repeat]

b. Polytomic series. Transverse components branch out. [Pieces start to switch places, diverge]

aa. Diverging series. The branching originates out of a stem of the series originally joined together (a parallel series turning into a polytomic series). [What happened overall in diagram A]

bb. Converging series. The branches unite in a stem that subsequently remains joined together (a polytomic series passing over into a parallel series). [What happened overall in diagram B]

C. Correlation series. Two or more independent series enter into a transverse connection and thenceforth run their course commonly. (Examples: 90-94. Also see Type 19.) [A series collision and then collusion, as it were]

VI. A. Segmental or metameric series. Longitudinal components are congruent or similar, like-oriented; axis of symmetry coincides with the axis of the serial process. [Component B always follows component A]

B. Bilateral or symmetry series. Longitudinal components are mirror images; the axis of symmetry is perpendicular to the serial axis. [Components switch: AB BA AB BA...]

VII. A. Motion series. The course of the series is outstanding due to the richness of things and events, filled with stormy energetic processes. (Example: 73.) [Lots happening]

B. Rest series. The course of the series leads through relatively empty spaces, times poor in events, all components in an entropic condition. (Example: 73.) [Little happening]

VIII. A. Quantity series. The aggregation takes place only through the amount of the serial components. (Example: 73.) [Numbers]

B. Quality series. The repetition takes places through the condition of the serial components. (Example: 73.) [Style]

IX. A. Equivalence or identity series. Longitudinal components of the series (individual members of the series) are in a condition of qualitative--sometimes also quantitative--agreement. (Examples: 66, 70, 71, 77.) [Tight correlation]

B. Similarity or affinity series. Components are only approximately of the same quality, or at least have gradations of quantity. (Examples: 67, 72.) [Loose correlation]

X. A. Homology Series. Only qualitatively, or also quantitatively, agreeing components belong throughout to the same universe of discourse, standing before us either as objective bodies (natural objects) or as subjective works of art, or both in the form of original experiences, or entirely in the form of recollected experiences.)Examples: 1-3, 5, 9-14, 16, 17, 19, 22b, 24, 26, 27, 29-31, 33, 34, 36-40, 42, 43, 45-56, 58, 60, 68, 70, 71, 72.) [All of one type]

B. Analogy series. The qualitatively similar components relate to one another as original experience and recollection, model and copy, natural production and artistic rendition. (Examples: 4, 6-8, 15, 18, 20-22a, 23, 25, 28, 32, 35, 41, 44, 57, 59, 69, 76.) [Of only suggestive similarity]

XI. A. Row or direct series. The components run their course (extend) in the same direction of time and space. Examples: 73, 76.

B. Crossing or inverse series. The components move (extend) in opposite directions.

XII. Opposition or contrast series. The serial components are related as negative and positive, form and ground -- "the reciprocal identity" is what binds the series together. (Example: 74.)

XIII. Alternating or exchange series. Arbitrarily different components (things, events), which form no series when recurring once, repeat twice or more in the same succession sequence or juxtaposition sequence.

A. Alternating series. Only two serial components are found in alternation.

B. Cyclic or circular series. More than two components, which come together in alternating segments (cycles) and in the most various combinations of like and unlike in number kind and order, interchange with each other.

a. Cyclical series. Components and segments (free cycles) are independent of time, that is their duration is not tied to any regularity.

b. Phasic series. At least one segment (bound phase) is dependent on time, its duration constant.

c. Periodic series. All segments (periods) are of regular duration.

(Examples: 81-89)

So when does one series begin and another leave off? In one view, since one leads to the next, never -- reality is a continuing evolution. But Kammerer makes the distinction that when all of the original components have changed, the series is over, or at least has gone underground until the original components again surface together (as they will) somewhere down the line. This, of course, is what we intuitively notice -- we feel when the run of luck is over, the crisis is finally past, and so on. Kammerer, however, has taken it out of the realm of anecdote and laid an organization on it, based on some fundamental assumptions about the way systems work.

One such assumption is that everything happens for a reason and nothing by chance. What we view as chance, or "random" actions, is simply events the causes of which we cannot perceive or deduce. When you flip a coin, it doesn't come up heads or tails by chance. It comes up one or the other for a very definite set of physical reasons: the rate of its spin, the height of the toss, the density of the coin and the surface it strikes and many other factors we cannot measure sufficiently determine without fail which way it lands. Enough factors of equal enough weight exist so that we can say that it will land more or less half the time one way and half the time another (not because it has two sides and must land on one or the other -- if the coin were even slightly bent it would totally skew the odds). Nevertheless, heads and tails do not evenly alternate -- they don't even stabilize regularly over ten or twenty throws. Instead, they come in clusters, some larger, some smaller, for reasons of complex systems of forces we cannot predict but can plainly see in operation. In these clusters lie the seeds of seriality which becomes a much more powerful element in more complex operations -- indeed, it may be the determining principle behind much of reality that we cannot directly trace to physical causality, because it is simply another order of the causality we already know.

V. The Mesoscale: Complex Systems At The Human Bandwidth

When modern science views the realms of the very small (particle physics) or the very large (astrophysics or cosmology), it tends to view these areas in terms of statistics. Individual photons or other particles are not considered to function by themselves, but only in relation to the unity or "gestalt" of the others around them.

In the realm of the very small, the microscale, we are forced to do this because we cannot isolate single particles without interfering sufficiently with them to destroy the validity of our observations. Thus, we have adopted the approach of quantum mechanics, which seems to get good results though by its shifting, almost immaterial statistical nature sometimes seems to defy common sense (how can light be a wave and a particle at the same time, for instance).

In the realm of the very big, the macroscale, we are equally stuck with having to make general mathematical and statistics-based conclusions -- partly because that scale moves over such large times and distances that we must surmise its actions from the more or less frozen time frame we have now, and partly because it is all too far away to get our hands on and have a good look at its particulars. On the microscale, we have to stay out of it to let it work consistently, and on the macroscale we can't get into it at all. Thus, we are forced to depend on generalized analysis of what we believe we are observing instead of dealing with individual objects and we are willing to ascribe physical laws in these areas that do not necessarily apply on an everyday object-by-object basis.

Much more accessible to us is the immediate world around us, consisting of objects and events at least somewhat commensurate to our size and speed -- the mesoscale. It is at this level that most observations and speculations, scientific and otherwise, have been made, at least until the beginning of the 20th century and the birth of particle physics and modern interstellar astronomy and cosmology. This is the scale at which we can touch, observe, and manipulate ourselves and our environment.

How we have interpreted our observations of the mesoscale has changed radically over the years, changing from an animistic view where we thought everything imbued with life and consciousness, through the classical picture of a world governed by independent principles and qualities, to the tightly-focused Newtonian view of mechanistic cause-and-effect. Throughout, the primary object of our search was to discover how and why things happen the way they do. It would seem, however, that none of the world-views we have come up with in our investigations have yielded either definitive results or concomitant satisfaction. Hence the many directions being pursued today to try to explain our increasing number of ill-fitting or anomalous observations in life.

Part of our problem has been the continual voyage toward an increasingly reductionist approach, ever-more dependent upon the assumption that we have, or can have, all the information necessary to make a satisfactory universal conclusion. In the animistic view, we have very little control over our environment, inhabited as it is by individual and often inscrutable spirits that individually run everything from rivers, to trees, to weather. Its advantage is, as with Native American culture, there is a tendency to feel like you're an essential and valued part of it all. The gods (predominately feminine) are with you all the time, though not always doing what you'd like. The classical view comes from having a good deal more control over day-to-day life but not having enough to feel the illusion of total control. You do what you can, while admitting there are many mysteries and processes you cannot specifically understand or master. The gods (a mixed lot, but predominately male) have fled to Olympus, leaving you only half in charge, but only half responsible. The post-Newtonian view, however, presumes that all the information is available (as long as you carefully collect it) and all you have to do is plug it into the rules, run the machines, and that's it. God (there's only one and He's male), is exclusively in His heaven, the earth is yours entirely to run, and it's all your fault. Some set of trade-offs, particularly when, ultimately, real control has not been achieved and intimate spiritual contact has been lost. But generally you live longer now, to appreciate it...

A fundamental presupposition in this form of progress is that the data is, if you look hard enough, all available. Unfortunately, and fundamentally, it's not. That's a fact that was originally well-appreciated but has increasingly been relegated to the fringes of spiritualism and astrology to point out and try in some minimal way to deal with. There are a lot, not just some, areas of influence on human life that we only have an inkling of and may never have more than that.

These are defined by what may be termed as the bandwidth of human perception and understanding. This can be defined both physically and informationally.

Physically, there's just a lot out there we cannot sense, no matter how refined our native apparatus or how well-developed our technical tools of assistance. Without external assistance, for instance, we cannot hear sounds under 20 Hz or over about 20,000 Hz. There's a lot going on outside of that relatively narrow bandwidth -- just ask your dog, or any migrating bird who navigates using ELF waves. With sensitive microphones and well-tuned amplifiers, we can now register such wavelengths, but on a daily basis we are deaf to them.

That's just the beginning. We have an equally narrow band of sight in light wavelengths, and in all other wavelengths of electromagnetic waves, we register nothing at all, at least consciously. Each time we develop a new generation of instruments, we uncover a whole new world -- as when the map of the sky was utterly revised with the advent of the radio telescope. Still, on a daily basis for most of us, most of it is simply not there.

That may be the least of it. For the longest time, we have believed that at least we had a pretty definitive handle on the behavior and organization of the data we could perceive. We knew order when we saw it and the rest was, well -- disorder, a sort of random background to be ignored, classified into oblivion. Then, since the advent of chaos theory, we have discovered that there are worlds of organization in what we previously believed to be disorder, utterly unavailable to us. The human bandwidth of perception is not limited to the physical world alone, but also limits our ability to see marvels of complex order staring us right in the face. Much, perhaps all, of what we had dismissed as "random" may simply be order in disguise, tucked away along with most of the rest of the universe, where we cannot comprehend it. Considering that, it's amazing we have managed to survive at all, if indeed survival is as dependent as we believe upon our conscious influence upon and control of our environment.

Increasing awareness of this problem has resulted in the recent explosion of different viewpoints, theories, and paradigms in order to put some larger sense of structure into our lives, both scientifically and spiritually. We are dreadfully in need of a new view of the physical universe, particularly at the level on which we daily function, and along with it a spiritual philosophy which reflects it (we've run out of sexes for our gods!).

Although we struggle sincerely and mightily, we are very much hampered by the old approach that has yielded us so much power over our immediately-perceived surroundings in the past 350 years -- namely, the current brand of the "scientific method." This has defined our immediate view of the world around us based on breaking down, isolating, and interfering with objects to "see what makes them tick." The more limited the data involved and the more rigorous the exclusion of natural forces outside the lab, the more successful the experiment has been believed to be. To be successful, an experiment must be able to be replicated, and you can't do that without thoroughly controlling the individual factors involved. When you are flooded with extraneous, "random" data, things never come out the same, and that obviates the experiment.

It has lately become apparent, however, that despite its powerful ability to produce immediate results, the isolated laboratory approach has limited our thinking, often to the extent of economic and ecological disaster. We have learned to see the trees but not the forest, and we have cut them down one at a time in the process. The result has been a tremendous body of knowledge about individual trees (or metals, or chemical processes, or anything else that flourishes in the isolation of the laboratory), which neglects how these elements all blend together in the mesoscale.

And when we do try to think at the larger mesoscale level, we quite naturally try to apply the rules of the smaller circumscribed laboratory to it and find they don't work well -- or at all -- once we reach a certain level of complexity. Paul Kammerer, being a naturalist who studied creatures moving freely in their own broad-based habitats, saw the problem and reformulated the successful principles learned in the laboratory to suit the greater scale of complexity -- and he did it without reverting to a statistical approach which would disallow understanding of individual systems and their components.

His most fundamental concept to approach this was the "body-complex" and "force-constellation." In the simplest lab-style physics, if you have two bodies orbiting each other and you know their initial speeds and trajectories, you can predict with virtual certainty where both of them

will be at any given time with a simple formula. Add a third body, and you suddenly find that such a formula is unavailable. You can only find out where they are probably going to be based on past behavior (although sometimes with great accuracy). Add a few more and you've lost control of the situation entirely, particularly if the bodies aren't in perfectly stable, circular orbits to begin with.

In daily life, however, the complexity is blindingly much greater than that. Crowds swirl about the town square, cars criss-cross the city, planes fly overhead, all with people and motives impossible to keep track of, but yet there is obvious order in it all. The order in it all, which is easy for any human to see, is that there are certain sets of things that orbit around each other to make a tangible, visible, and functional continuity. They extend from very small, tight and localized to very large and loosely oriented, and we intuitively treat them as if they have a certain kind of life of their own. A car. A family. A business. A city. A holiday. A ball game. All are organizations of objects and forces that maintain their integrity by a certain inner "glue" that sometimes lasts a long time and sometimes is dispersed by collisions with other constellations of bodies and forces that may alter or entirely replace them.

It is these kinds of swirling, orbital complexes that Kammerer asks us to take note of and observe by what rules they work. This is the real world we live in and what our most advanced capabilities of intelligence focus upon. On a daily basis, we cope with this amazing complexity so intuitively and naturally that perhaps we are drawing on information well outside of our recognized bandwidths without consciously realizing it. But just what rules are we playing by? We often casually note, for instance, that these larger systems behave as if they have a life of their own, because in certain special ways they very much do. It is in these contexts that what has been learned in the lab may be usefully applied only where they actually still apply, rather than deluding ourselves that these more complex systems obey only the rules of more limited (albeit rigorous) observations.

Kammerer proposes the most elegantly simple answers, without stepping outside the bounds of accepted scientific reality. Once we have recognized that it is the behavior of these complex systems that must be understood, we must look to see what kind of laws they might be obeying that might be similar to or developed from the ones we already know. When we do, we come to the strange conclusion that events considered to be accidental and inessential by much of modern science are in fact proper and essential attributes of the mesoscale itself.

Kammerer's first and most fundamental suggestion in developing this approach is an upscaling of the simple concept of inertia, which he called persistence...

VI. Persistence: Inertia At The Systems Level

“Every body perseveres in its state of rest, or of uniform motion in a straight line, unless it is compelled to change that stat by forces impressed upon it.” – Newton

“...a constellation of forces breaks off and leaves a complex of bodies in the condition and direction in which it is occurring, which it maintains by virtue of its persistence until another constellation of forces sets in. This clarifies the element of lawfulness in the persistent retention and recurrence of the same, as well as the lack or lack of necessity for an immediate special cause for it.” – P.K.

This is Kammerer's extension of the classical law of inertia, Newton's first law, to the processes of the mesoscale. When one event follows another without any commonly acting cause, traditional causality teaches us to attribute their individual occurrence to special causes in each case, and their proximity in time to chance. But when the second event resembles the first in some way, it is tempting to think of it as some sort of continuation of the first. If this were generally the case, we would have a very simple device for explaining temporal clusterings of like events.

Everyone knows what inertia is. It's that tendency for something to maintain its current state of motion (or non-motion) and keep on moving straight ahead until something gets in its way and changes its state like friction or an encounter with another object. A golf ball lies there on the ground and doesn't move. Hit it with a club and it keeps moving until friction slows it down, gravity pulls it down, and thump! it gets stopped by a sand trap.

Simple physics, but no simple explanation. *Why* does it keep moving – or if stopped, *why* does it remain stopped? In fact, no one really knows, it's just that way. Indeed, the inertia law is a kind of skeleton in the closet of physics. Ernst Mach suggested in somewhat oracular terms that the net gravitational effect of all the bodies in the universe must be somehow holding any given body in its state, but more specific attempts at explanation based on Mach's principle have all more or less foundered on the inability to find a dynamic scheme for carrying it out. The classical inertia law, which seems almost self-evident to us at some level, turns out to be quite a puzzle. In a way it is two claims in one: that the natural, uninfluenced state of a body is uniform rectilinear motion, and that it resists any change in its state. The latter property is called the mass of the body, and this a basic part of our experience of the world. We all know that we have to push on things to get them moving or to make them stop. However, the former property is far from being obvious. In fact, it was not self-evident even to Galileo, one of its early champions, who had to reason it out. Does it resist because of a positive effort to maintain its state? Or does it continue because the resistance has nothing to work against? Or does a body have its continuation for one reason and its resistance for another?

Perhaps the problem is that physics has been investigating it at the wrong scale. Is it solely a concrete physical phenomenon or does it apply to less-than-concrete objects like systems?

We often speak of events and systems at the human level as possessing inertia. Events are "set in motion," catastrophe approaches inexorably, bureaucracies possess a crushing inertia, etc. In these various categories we can often see that systems exhibit different types of responses when they are interfered with. When the golf ball hits the sand trap, it stops through physical contact. Its inertia has been countered by that of the trap. If a golf cart containing picnickers hits the sand trap, it too stops, the passengers being thrown forward until physical contact stops them as well, spills their basket, and ends the picnic. But if one of a *fleet* of carts on a picnic outing hits the trap, the entire fleet stops, although only one hit the trap. What kind of contact was made that could have accomplished this? Of course the answer is: information. This time the sand trap has encountered a solid object wedged to a whole body/force complex woven together by mutual recognition and intent. Everybody has come to a halt until the cart can be freed from the sand trap, so the sand trap has not stopped the picnic outing, but only delayed it. In encountering a much larger system, the sand trap has, so to speak, met its match while still altering the overall trajectory of the picnic *temporally* instead of spatially.

One might argue this specific example (or any other) from a host of perspectives, but it illustrates the heart of Kammerer's proposal that at a certain level of complexity, systems take on their own inertia over and above that of their individual components. It is at this level we have left the applicability of pure laboratory investigation and find ourselves in the middle of the experiment in real life. An object of any researcher will be to find the threshold of complexity where this systemic inertia begins to manifest itself and where the simpler version of the law alone no longer holds sway. We will propose both a lower threshold and an upper one (where the mesoscale meets the macroscale) in Chapter X.

We naturally recognize this special kind of inertia which Kammerer labels "persistence" in many areas of life, and particularly in life forms themselves. Anything set up to perpetuate itself (a self-organizing system) tends to possess a greater measure of persistence. People, corporations, institutions, species, countries, worst of all bureaucracies often accrue a crushing inertia, which all too often increases with age. In such systems, the densest and slowest stuff (the physical plant) all the way to the fastest and lightest (information) orbit around each other and tend to stay that way with ever greater inexorability until something causes the whole thing to go on the rocks.

The longer the persistence, the greater the power and durability. It has even been proposed that this principle of accrual of inertia is a form of stored energy (which in a way it is) for purely physical objects. The reason for this to be the case in systems is more intuitively easy to see, the longer a system maintains itself, the more adapted (and dependent) its environment becomes to it, creating an environmental niche which will tend to push the system back into its original form when disturbed. The longer it goes on, the harder it becomes to dislodge until it either meets catastrophe from within (a fatal, timed evolutionary flaw) or without (in collision with an even stronger system or force). The internal mechanism of this self-perpetuation is the subject of the next chapter.

Any such system has within its subsystems, of course, all of which mutually influence and shape each other, until basically the nature of the whole system becomes imprinted on each of its members in the very shapes and trajectories they maintain within the whole (not, be it clear, through any New Age "holographic" qualities, a generally weak analogy). Then, when the system does at last appear to break up, off go its parts in various directions, carrying with them the stylistic, spatial, and vectoral hallmarks of the experience. Having parted company at the same instant, they proceed onward and mixing with other elements from other systems, surface later on as often as not simultaneously, their similarity and simultaneity spooking the future observer as having seen something mysterious, acausal, and "synchronistic." In fact the order which we once believed we saw and then saw vanish has simply passed beyond our ability to inspect and then later come back into our "bandwidth" of perception.

That such startling displays can be made even in the laboratory there is no doubt. Turn-of-the-century French topologist Jules Henry Poincaré devised a topological transform that gives a limited two-dimensional illustration. A picture of a face is drawn, composed of hundreds of individual dots (pixels). Then a formula is implemented which moves each dot by a certain degree, depending upon its original position. After only a few such moves, the picture fades into a seeming randomness of dots. After the move is made hundreds of times, the picture begins to show up again,

but in altered form. One time, multiple small overlapping versions of the same face show up like echoes across the screen. Then they vanish back into the void and further on the face is almost (but not quite) identically reproduced at its former size.

The effect is spooky, but it is a simple demonstration that the same recognizable order we perceive at one moment may seem to vanish before our eyes in the next while still actually maintaining itself. It has, in a way, departed from the spectrum or bandwidth of organization which our internal structure enables us to perceive. It has dropped below (or perhaps risen above) the focus of our perception. Then, when it reappears later, we are astonished, thinking it to be magical, or mystical, or “acausal” when it is nothing of the sort. Although Kammerer himself thought that this process was probably beyond the powers of exact mathematical physics to grasp, it is almost perfectly described by the topological transform called the Poincare recurrence described above. It is too bad that Kammerer did not know of this particular discovery of Poincare’s, since it would perhaps have advanced his work enormously and at least given him confidence that he was on the right track. As it is, we might consider it a serial pre-image of seriality itself.

This, however, is still only a restricted example in itself, confined to the limits of a single computer screen. What might maintain this kind of order in real life where greater complexity may be expected? Kammerer offers an auxiliary hypothesis that would further contribute to the inertia of the body complex: the inertia or persistence of forces, their tendency to continue to act “internally” or give the body complex an internal push even after they have broken off “externally.” This is very strange sounding at first. It clearly does not mean to imply that a baseball bat continues to strike the baseball after the ball leaves the bat. Nor can it simply mean that the effect that the bat has on changing the motion of the ball lasts, because this is no different than the persistence law for bodies.

The persistence of forces is perhaps easier to see if we use the more generalized notion of a force as a potential gradient, or energy differential. Heat introduced at the bottom of a water heater, for instance, establishes a gradient from hot to cold, from one end to the other, that persists even after the heater is turned off as the individual eddies of hot and cold water mingle in a pattern determined by a force that is no longer being applied. The Poincare model above assumed that the bodies themselves were not undergoing any internal changes in their material qualities as a result of their interactions, although we know that a variety of natural energetic reactions can be taking place. The persistence of the force constellation can only mean that the natural interaction become biased in favor of an overall potential gradient that imitates the impulse given to the body complex by the initial force constellation, an energy differential that will of itself tend to repeat the initial event. It is like a bunch of hungry workers, who at mealtime stop short of eating their entire lunches, as they perhaps normally would, because they know they may need an extra boost later in the afternoon in order to finish a particularly strenuous task.

This gradient is dependent on the bodies in the complex and is thus constantly changing, as was the configuration of the body complex. For the persistence of forces, we must suppose that even though it is constantly changing, its overall “configuration” with respect to the body complex remains the same.

Thus, the persistence of forces contributes to the inertia of the whole both on its own account, as a gradient that is constantly changing but maintaining all the while a basic structure, and as something that gives the serial process a continuous kick, thus giving it a certain robustness, or power of returning to its original course when deflected. (We alluded to these two different types of persistence above.) If unimpeded, this second factor would tend to accelerate the serial repetition of the body complex and make them cluster in time. We will return to this in chapter 7.

We now return to the isolated body with a new conceptualization of its inertia. It is the tendency for all the particles to continue and repeat an initial configuration as in the Poincaré model. We are all familiar with the property that a spinning top has of resisting any change in the orientation of its spin axis. The situation we are describing above is almost like a top that is tumbling as well as turning, spinning around many or all of its axes at once, so that it resists being moved in any direction at all. Of course, a solid body can only spin around a single axis at a time, because its parts are not free to roam around so freely. [Ed note: not so, as the top analogy demonstrates] But nothing at this point prevents us from imagining that the complex vibrations of the molecules in the solid body (responsible for the heat of the body!) can be resolved into coordinated angular momenta about many axes that simulate actual rotations of a solid body.

However, this is not yet an explanation, for in the traditional explanations the behavior of the top depends on the inertia of its parts, and not the other way around. But do the molecules of the solid vibrate in a coordinated structure so as to produce the inertia, or do the molecules vibrate as they do because of the inertia of the structure? Who is the horse here, and who the rider? Leaving this problem aside for the moment, we have here a new conceptualization of inertia on which a new explanation for it could be based. This problem will be taken up in the next chapter.

This postulate of the persistence of forces is in fact tantamount to Einstein's conclusion that the inertia of a body depends on its energy content, that energy absorbed by a body will tend to keep that body in its state of motion all the more steadfastly. Kammerer's formulation of the persistence law for force constellations at the mesoscale actually makes this property of energy somewhat more intuitively clear.

Indeed, the fact that the persistence of forces can be proposed as a certain bias in the naturally occurring electromagnetic interactions between particles also makes it easy to speculate on dynamical explanations for the length contraction that bodies experience at higher velocities.

If this picture truly reflects the kind of organization of systems and their parts (whether scattering or gathering) at the mesoscale, then a host of mysterious phenomena would be immediately explained without having to go further. We will enumerate some of them in Chapter 10.

As suggested earlier, for persistence to have such a powerful effect, it must work in concert with higher systemic versions of other physical laws, the most important of which Kammerer labels "the imitation hypothesis."

Summary: *Kammerer looked at inertia like Einstein, as an active, not a passive principle, particularly where complex systems are involved. At a certain level of complexity, systems become*

robust information vehicles that collide and transform each other but do not lose information, rather alter its order and frequency range. Similar to Poincare's topological transforms, information simply goes underground, so to speak, in forms and at scales and bandwidths we cannot distinguish – only to mysteriously surface later in familiar form in several places at once or in direct temporal sequence. This happens across the board wherever there is physical/energetic interaction, but especially where faster-moving recursive systems such as life forms are involved.

This chapter will include a number of concrete examples of topological folding and mixing with appropriate graphics to broaden the Poincare image and introduce new dimensions of time and space a Kammerer has suggested. It will also begin to develop a computer topological transform graphic which will be altered in following chapters to show how each of K's principles do not work alone but combine together to model the real world.

VII. The Imitation Hypothesis: Higher Level Action/Reaction

"And this is the essential content of my 'imitation hypothesis': that no body, no thing in general, (whether body or force) can remain in the neighborhood of another, without becoming similar to it in all respects. Whereby, the amount of the attained similarity must be directly proportional to the duration and intensity of the action and reaction exerted on one another." -- Paul Kammerer

Who has not noticed that married couples with physical and emotional characters of their own tend not only to act more like each other over the years but actually come to look more like each other? It seems intuitively obvious that it should happen -- how could one not sway in style toward the other through constant contact and compromise -- but are we talking universal law here?

Yes, we are talking universal law, one that is well-known though not always well-applied. It is Newton's Third Law, that to every action there is an equal and opposite reaction. Everybody knows that. But as with inertia, why? And where does it apply? In a way, it is a rephrasing of the law of conservation of energy -- energy (action) gets transferred, it doesn't just go away, ever.

In order to find out where it is going, you need to measure the type of energy: heat, sound, light, potential, work, and so on. You also need to know the nature of what it is interacting with: stone, metal, wood, water, air, protoplasm. If Kammerer is to be believed, you also need to know the complexity of the systems within which it is operating.

The equalization of temperature differentials between adjacent bodies is a good example of the way that material qualities imitate one another. When a hot body is placed next to a cold one, both tend to become lukewarm. A vibrating musical string next to a still one will cause the still one to begin vibrating to a greater or lesser extent (depending on their resonant frequencies) and eventually both will come to rest, the surrounding air having added to the situation and absorbed their energy.

In both these cases, there is actual loss of organization in the systems in order to become alike, an increase in entropy approaching equilibrium.

On a much larger and longer scale, mathematician and fractal originator Bernard Mandelbrot's work suggests that adjacent mountains, when first formed, may not resemble each other much, but as they share the same local environmental stresses, erosion, etc., they tend to become more and more self-similar and various different large and small scales, developing a

shared fractal structure. Although there is yet no proved causal link between the mathematics of fractal structures and why they resemble natural forms so closely, Kammerer may here have suggested the answer.

Here's a third example where organization was entirely retained. A few years back one of us was performing with an a capella singing group at an outdoor festival which also featured very noisy biplane aerobatic shows. In the middle of one song, a plane did a power dive right over the tent, the deafening pitch of its motor ever decreasing as it slowed and pulled out of its dive. As its pitch passed through the tonic note of the key we were singing in, it carried us right on down four notes lower, in which key we finished the song! That is the imitation effect, and in its most volatile medium -- information.

What makes two discrete objects or systems become more alike in each other's presence is, in a word, interaction. It can be direct interaction, as with the vibrating strings or informational interaction as with the vocal pitch dropping. Either way, it happens daily in a remarkable number of well-known but all-too-uncorrelated manifestations.

In its simplest manifestation it is called entrainment or mode-locking and happens in all systems which exchange regular information. It was noted as early as the 17th century by the Dutch scientist Christian Huygens when he found that a room full of pendulum clocks, if left alone for a time, always end up in perfect lock-step, no matter how out-of-sync they were to begin with. This same phenomenon is found in orbiting bodies whose period of revolution is a small multiple of their period of rotation (the moon always presents the same face to the earth, as will eventually Mercury to the Sun, for instance), and in the behavior of various waveforms (quartz crystals and radio waves, certain ocean and tide wave configurations, and even coordinated firefly flashing). Though a variety of transfer mechanisms may be invoked in each specific instance (sound waves through the walls for clocks, gravitational tidal pressure for the moon) the principle seems to hold - stronger more regularly periodic systems tend to bring smaller less regular ones into line.

When you are dealing with highly complex systems, such as human beings, the imitation effect may be much more subtle but equally pervasive. The observed tendency for women office worker's menstrual cycles to fall into synch with that of the dominant woman in the office is just one example. Systems tend toward equilibrium, and the more interaction they have and the greater its intensity, the sooner it is achieved, and achieved in the direction of the stronger, larger, more energetic system.

The novelty of Kammerer's understanding of these phenomena lies in the way that he sees an inertial principle even here: eventually, the periodicity that the lesser system takes on from its surroundings will be held fast; it will retain its new periodic character as something endemic or indwelling even after its link with the larger system is broken (as with the power dive).

A Second Look at Temporal Persistence at the Mesoscale -- Equilibrium achieved by the imitative equalization of energy--stable equilibrium--is a kind of inertia. But if the physical inertia of an individual body can be thought of as an equilibrium state at all, it must be regarded as unstable equilibrium, because it does not return to its initial state when disturbed. In a daring application, Kammerer tries to interpret the mass of an isolated body and the persistence of a body complex as a temporal equalization of energy, an action and reaction of material contents of successive moments. His argument concentrates on the physical inertia of an isolated body. He presupposes the existence of the body in successive moments of time--where it would be by presupposing its uniform rectilinear motion--and sees that the energetic interaction of the body in two of its moments would tend to hold it in place.

Temporal Imitation and the Problem of Motion -- This speculation complements a result of Einstein and others that the gravitational field itself controls the movements of the sources of the gravitational field, which, by the way, is no less paradoxical sounding than Kammerer's claim that the future reacts on the present. In fact, it is quite reminiscent of it, and Kammerer's hypothesis could be understood as its converse in the language and concepts of the older mechanics. The field is effectively the action of the future state of the temporal "environment" of an open system on the present. Perhaps this is a new way of looking at the intangible "reality" of the field.

This property would account for the common geodesic behavior of bodies in a gravitational field--that is, a generalization of their property of uniform rectilinear motion--but not for their specific masses, with which they resist changes in this geodesic motion. Any attempt to derive the mass from the effect of the gravitational field alone on a material body effectively takes us back to some version of Mach's principle. However, Kammerer's argument (and our elaboration of it) derived in an intuitive way the mass from the imitation of the material contents of successive moments of the geodesic motion as given, thus providing for an intrinsic mass.

This reasoning allows us to make a qualitative prediction about the inertial behavior of an individual body immediately after impact. If the mass is the result of temporal action and subsequent reaction, then, like a spring, it must oscillate for a while immediately after impact before coming to equilibrium.

Furthermore, Kammerer himself predicted that there must be a natural tendency for irregular series to form periods, if temporal imitation is the cause of persistence. Perhaps this could also be put to the test.

By putting together his generalized inertial principle and his special understanding of mode-locking, Kammerer can begin to make sense of a host of anomalistic phenomena in biological evolution, statistics, medicine, anthropology, parapsychology, history, and lots more.

VIII. The Attraction Hypothesis: Birds Of A Feather

"...serial clusterings are explained by the maximum attraction that relentlessly drives together, to the greatest degree, things of the same kind." P.K.

Do opposites attract, or birds of a feather flock together? The former would tend reduce the overall number of coincidental events in a given locality, while the latter would tend to increase it. Or is it merely a question of the greater mass attracting and being attracted more than the smaller mass, the kind of object being irrelevant, as Newton's law of universal gravitation would tell us? If Kammerer is correct, and we live in a super-coincidental universe, then it's more likely to be birds of a feather.

The Problem of Entropy -- Although the imitation hypothesis, based on energetic interaction, accounted for an homogenization of objects and events in a given vicinity, it cannot be the whole story, because it cannot explain the frequently observed clustering of like. By itself, the energy exchange tends to equilibrium, a tendency toward maximum likeness and entropy. (Remember that Kammerer is writing this before the full understanding of the behavior of open systems, which it is now believed may have a self-organizing character.) Plus, the natural movements of bodies around in the system following the dictates of their own mechanical

interactions and gravitation do not prevent the increase of entropy, since they tend to a random statistical distribution of the bodies.

The Attraction Hypothesis -- Kammerer's third hypothesis is designed to counteract this entropic process, and complement the imitation hypothesis. It postulates that like attracts like more strongly than unlike. This new hypothesis tends to create a clumping or clustering of like objects, thus offsetting the mechanical tendency of the bodies to randomize. But greater proximity of the objects furthermore tends to accelerate the energy exchange process, thus further increasing the likening in this area, producing an island of like, and offsetting the overall equalization of energy to some extent. But the system does not reach stability here in this non-homogeneous state either, because contact after a time produces a reversal of polarity and repulsion, tending to a dispersal of like objects, resulting in a differentiation, thus producing an island of unlike in this same region. Thus we have an oscillating alternation of concentration and degrees of like and unlike in any given region.

Readers of Belgian chemist and thermodynamicist Ilya Prigogine will find this image familiar because it very closely presages his recent "swing theory" of open systems which he proposes to explain the obvious reverse entropy of so much of the observable universe. Kammerer's approach, though proposed earlier in time, also takes into account open systems and further agrees that the intercession of other more dynamic systems helps kick those in equilibrium back into motion. However, the attraction hypothesis as seen by Kammerer pertains to the system itself and does not depend on its interaction with the environment. It is essentially a statement about closed systems.

Objections to the Attraction Hypothesis --The first limitation on this third hypothesis of Kammerer is that it seems to presuppose an isolated system, in which energy exchange is conservative and there is no downgrading of energy into less available forms.. But the earth itself must be understood as a closed system, exchanging energy with the solar system, while the subsystems to which seriality is meant to apply must be understood as open systems, exchanging both energy and matter with other subsystems. For both the earth as a whole, and the subsystems themselves, the downgrading of energy into heat plays an important part.

The second limitation is that there is no favoritism as to like in the universal gravitational attraction law. Kammerer is aware of this, but argues that since there is abundant evidence for a likeness bias with other energies, we should perhaps suppose that it is merely very small in the case of gravitation.

However, we can simulate more or less the same effect without recourse to the likeness hypothesis and without requiring a fully conservative system, by using a nonlinear, non-conservative dynamical system of the type popularized in chaos theory, which avoids both problems. These systems have the added attraction of producing self-similar scaling structures when they are in a chaotic mode. Kammerer speculates that there are such structures and in his classification system they are represented by collateral spatial series (see Chapter 4). Those investigating the fractal geometry of nature have been discovering that such structures are the rule rather than the exception in nature. However, it is not clear whether the imitation hypothesis, as modified by the attraction hypothesis, is adequate for creating such structures. If not, it would be a further reason for rejecting this part of Kammerer's argument.

The way of deciding between Kammerer's view of temporal imitation and ours is to determine whether events do not merely tend to persist, but have a restorative capacity as well, a tendency to return to their original course. If the latter is the case, then our view is more likely. A number of other interesting properties would follow, such as the existence of lower limits,

bifurcation points, and other threshold points for the persistence of a body complex and force constellation. In fact, the entire machinery of nonlinear dynamics could be brought to bear on the study of such systems. This would include analogues--or are they more properly manifestations instead?--to the law of minimum entropy, chaos, and dissipative structures.

If we transfer this non-linear model to temporal imitation, we may make yet some more qualitative statements about the physical inertia of individual bodies. If this whole chain of reasoning is correct, it should account for a whole host of known relativistic features, as well as several unsuspected ones. In particular, it follows that there is a minimum velocity before relativistic factors begin to come into play. Also, that there is a least amount of energy that a body can absorb before it will make a permanent contribution to its inertia.

IX. Information As Structure: Toward A General Theory

"There arises the picture of a world-mosaic or world-kaleidoscope, which, in spite of continually changing and constantly recombined positions, also keeps throwing like together with like. -- The image of the world as a movable mosaic, as a puzzle with interchangeable pieces is old: as a round-dance of "atoms whirling through one another" it is the foundation of materialism; it found its energetic deepening and now finds its serial complementation. The materialistic world-view was overcome; and from the energistic world-view, which took its place, it remains even now to remove a one-sidedness: just as in the mosaic picture created by art, the round-dance of the same meets our eye as ornament, so that the corporeal vision does not get confused by the lack of a reference point; so in the world picture created by nature the partiality of the same finds its place, so that the mental vision does not get confused by the lack of boundaries. From the self-searching, fleeing, and re-searching out of like-constituted elements, the world receives its appearance of order on all sides, of harmony." -- P.K.

What is implied by Kammerer's threefold approach to seriality is virtually a "Law of Conservation of Information" (our phrase, not Kammerer's) which suggests that at whatever rate its apparent dispersal, no information is lost. It only vanishes from our bandwidth of perception, to reappear in altered but often recognizable form down the road. Even where things appear to have come to a complete halt, the very energy and information lost in the race toward equilibrium are stored in adjacent systems and come back in evolved form to rejuvenate the original into new life -- which suggests that these adjacent systems are simply part of a functioning larger one (the mesoscale itself) that contains them all. But if no information is lost, what about entropy?

In the case of information at least, as has been previously suggested by information theorists like Claude Shannon, entropy may well be largely in the eye of the beholder, defined by artificial limits imposed by the observer. This kind of approach to the apparent loss of information is also reflected in recent developments of chaos theory where phase-space diagrams and fractal dimensioning reveal order that was previously assumed to be lost.

Kammerer's view, and ours, is that virtually none of it is lost, and it is the type of order and the surroundings in which it is buried that hold the key to where it will burst forth in the future. Whereas chaos, fractal, and information theory tend to be specific and applicational, our approach is more universal and embracing, an attempt to tie them all together based on the framework of a paradigm that vanished before it could get a hearing. Its implications allow application of these

very later developments upon a much broader scale than their current proponents have had the imagination (or perhaps audacity) to suggest.

Indeed, the implications may suggest other ways of conceptualizing time and space and may apply to the as yet unestablished connection between information structure, electromagnetism, and gravity, among other cosmic conundrums:

The One Series Law -- In synopsis, persistence, imitation, and attraction are constituent parts of one law of seriality. Persistence is temporal imitation. The attraction hypothesis (or its non-conservative equivalent) complements the imitation hypothesis to account for the simultaneous, spatial clustering of like things. The attraction hypothesis also complements the persistence hypothesis, accounting for the non-uniformity of temporal clusters of like. The whole thing is basically a statement about the reasons why like things cluster, why the world has a balance of sameness and difference that we call structure. In order to see what bearing seriality has on the full articulation of structure, we will first recapitulate some of the pertinent concepts.

The Relation of Persistence and Adjustment -- Persistence and adjustment(imitation/attraction) are two sides of the same coin. Increased persistence is tantamount to a diminished adjustment and vice-versa. They are thus contraries. However, the conceptual relationship between these two is rather subtle. One of these pair does not dominate over the other as in the case of the contraries hot and cold, where we tend to define cold as merely the absence of heat. Rather, each member of this dyad has a positive significance.

Persistence is primarily the absolute concept, having to do with an intrinsic capacity on the part of the body complex or force constellation to resist change, in this case to resist the erosions of space and time themselves, an unwillingness to "adjust" to them. Thus, a greater absolute persistence is at the same time a lesser absolute "adjustment," and vice-versa.

Adjustment is primarily the relative concept, having to do with the capacity to adapt to a given environment, a tendency to compromise and to renounce stubborn "persistence" in the face of the environment. Thus, a greater degree of relative adjustment is tantamount to a lesser degree of relative "persistence."

The relationship between absolute and relative persistence (or their adjustment counterparts) is still somewhat mysterious, partially because of its enormous specific complexity.

Both persistence and adjustment have a temporal and a spatial application and tend to enhance one another. The longer an event persists and displays serial behavior, the more its correlating effect extends to the outside environment and produces collateral series, tends to a greater spatial "persistence" (or lessened spatial adjustment). Reciprocally, the more spatial seriality there is, the more routes there are for the temporal process to repeat a given event, so that if the original event begins to weaken, these collateral serial processes can give it a boost. Thus, greater spatial seriality promotes a greater temporal persistence (or lessened temporal adjustment). Spatial and temporal seriality seem to support one another in their attempt to persist against the environment. When their interaction has reached equilibrium, the persistent structure has created a kind of niche for itself in the environment.

This may be likened to the interaction of electric and magnetic fields. In this case an electric current (a constantly collapsing electric field) produces a magnetic field that curls around the wire. And similarly, a magnet moved in the vicinity of a loop of wire (in other words, a changing magnetic field) induces a current in it. If we regard the temporal persistence of an event as if it were a configuration "particle" being pushed along through time by a continually collapsing

structural "field", then we may compare its spatial effect on the environment, its spatial "persistence," to the magnetic field "surrounding" the current. And vice-versa.

The Relation of Material and Formal Causality -- Kammerer is adamant in considering seriality a subordinate mode of causality which he calls persistence causality as opposed to contact causality, or ordinary efficient causality. However, from our point of view, this is a bit of an anachronism on his part, because seriality can be regarded as true formal causality. And just as modern physics has effectively sought to reduce all causality to its own brand of efficient causality, seriality gives us a way of unifying causal thinking under the aegis of formal causality, perhaps not exactly the variety entertained by Aristotle, but close enough to bear comparison.

Thus, as we have said in chapter 5, persistence of the force constellation as a potential gradient is the balancing out of two tendencies. The first tendency is for distinct efficient causes in the system to disassociate into a gradient that imitates the initial constellation of uncorrelated forces. If we think of the initial constellation as the cause of this tendency, it may be regarded as the material cause of the event, even though an uncorrelated group of causes is usually considered to be what we mean by chance. The second tendency is for uncorrelated causes to be frozen into common causes in the sense of intentions, purposes, and habits -- all largely fitting under the heading of final causes if we consider them to be responsible for this tendency. We chose to call the persistent gradient which is the balancing out of these opposing causes a formal cause, since it continues to act to bring about an event with a certain configuration.

From another point of view, the persisting configuration in the body complex that constitutes the event may be likened to the formal cause, since it is this configuration that remains throughout all the various changes and replacements of its members. It is what was there all along.

However, these two senses of formal causality are interdependent. We have already mentioned that the persistent gradient works to maintain the configuration. Similarly, the relative movements of the elements in the configuration continually change the overall gradient. It is only together that they constitute the structure as a cause.

The Full Structure Concept -- In view of seriality, structure seems to be a more involved concept than hitherto suspected. Spatial seriality (including spatial self-similarity) amounts to the negative entropy commonly used to measure structure. It is the amount of structure (although we must emphasize that we have conceptualized it as an intensity). However, regarding structure simply as negative entropy is like regarding the inertia law solely as dictating the geodesic behavior of a body. We could then only track the progress of this structure through time and say that the process also has a temporal structure. This would bring up the problem of how the two distinct structures are related (which takes us right into the heart of the problem of spatio-temporal chaos). The very term structure suggests something abiding in time. We must not leave out the temporal persistence or intensity of the structure, as it is intrinsic to its concept. So rather than say that the process has a temporal structure, we should say that structure has a temporal component. It is better to begin with temporal persistence and negative entropy (spatial seriality) as two components of one structure.

Furthermore, the total structure must involve not just the configuration of elements in space and time, but also the persistent structure of the changing causal gradient they create and are involved in, which is somewhat more difficult to define.

Finally, we must realize that there are absolute and relative components to the structure, corresponding to the persistence and the adjustment respectively.

The Unity of Mass, Energy, and Information -- In purely materialistic and quantitative terms, mass is a measure of the amount of matter, energy a measure of its potential for motion, and

information a measure of the amount of structure. On the other hand, if the field is the primary reality, then energy is related directly to its metrical properties, mass must also be derived from the field itself, and structure is again a derivative concept. In these two views, matter and energy respectively are the bearers of structure. But we have explicated mass and energy in a temporal context, which has led us to regard them in a new way as a relation between two contrary tendencies. It would be consistent for us to treat information from the same point of view, which is more in line with the very concept of structure, which seems to imply a tendency for its "pattern" to persist. In this case mass and the inertia of energy are the two principal components of the temporal dimension of information--information is the fundamental entity, and mass and energetic inertia its basic manifestations.

In this way, information mediates between the gravitational field and the electromagnetic field for we know that the gravitational field can affect the relative persistence or mass through the adjustment capacity of the body and vice-versa. Similarly, the electromagnetic field can affect the inertia of energy through the adjustment capacity of the gradient, and vice-versa. But in an intuitive way we have also come to see how the persistent force constellation or gradient continues to influence the persistence of the body-complex, its inherent mass. Thus, the real question: how do the absolute and relative components of persistence interact?

Conservation of Information -- In chapter 6, we argued that the downscaling and degrading of structure in the production of self-similar series did not rob the system of structure, but was a kind of gift due to the persistence of the force constellation, in a sense contributing to the total structure by increasing the fractal dimension. The question remains whether structure is lost or dissipated or in some other fashion becomes unavailable. The complexity of the full structure concept, and information's role as mediator between mass and energy, lead us to the conjecture that there may be a conservation of information. Further understanding of the components of information may help us see how the information may be stored sometimes in the environment, sometimes in the temporal dimension, sometimes in the gradient rather than in the configuration, but never lost. The trick is to follow its movement.

Seriality as a Measure of Structure -- If information is the measure of structure, then a complete concept of information must take into account both the temporal and spatial dimensions of structure, its persistence as well as its potential for adjustment, and its potential gradient as well as its configuration. But these are all factors in production of coincidences or series of various kinds. Thus, we come to the striking conclusion that seriality may be useful as a measure of the overall information in a system, and may furthermore become a tool in the investigation of systems and subsystems themselves.

X. Direct Applications of the New Perspective to Phenomena of the Mesoscale

There are many phenomena in numerous fields that might be explained by direct applications of the series law, examples of succedent and/or simultaneous series, mainly by postulating an appropriate event as the originator of a series. Here are a few examples:

HISTORY -- They say that history repeats itself, and this may be true in an even deeper sense than commonly understood. Human history may in fact be a veritable theater of seriality. Dramatic events that affect large numbers of people and break down the prevailing causal structure-

-wars, catastrophes, etc--free many events so that the natural attraction and affinity of events can allow them to reconfigure serially, thus creating a riot of coincidence.

However, such large scale events also have a great amount of inertia. A great many people experience very similar, intense experiences, not just internally -- rather, the environment itself undergoes a very radical and specific restructuring. When it is over (indeed, as it is happening), these structures branch and effectively go underground, to recombine and surface later in perhaps familiar, perhaps unfamiliar guises, but nevertheless related reincarnations (so to speak). If they should retain their warlike habit, it could mean the onset of hostilities that the best of peacemakers could not avert, being ignorant of the real source.

Thus, seriality could account for much of the history subsequent to these events. It is even possible that seriality is the dominant principle in history, the only way of seeing the overall correlation of causes and events. If so, it would be most important to learn to recognize the various ways in which series become temporarily unrecognizable, only to resurface later. These include: 1) Inherent intensification and remissions of serial process 2) Divergence of serial characteristics and subsequent reconvergence 3) Temporal displacement of serial characteristics. Internal causal structures can damp seriality, although persistence of forces may be enough to overcome it. Then the path of repetition may 1) Scaling temporally or spatially 2) jump to a different realm of being through analogy 3) change form or function keeping same substratum by homology.

If seriality can account for specific major, recurring trends in history, these might be twofold. First is the tendency for major technological and social innovations to occur in separate places at more or less the same time, which then go on to have spiraling effects quite out in the open. The second, and more intractible, might be the astonishing degree of hostility that can surface between formerly warring cultures long at peace. It is as if largely-forgotten hatreds resurface with inexorable force that then lead on from atrocity to atrocity, reviving problems thought to have been left far behind. Perhaps the very process of peacemaking carries with it the burial of much darker forces rather than their expungement. Then, when peace is no longer enforced, the buried side resurfaces like a ship capsizing, the more powerful and destructive because the less expected or understood.

As for general theories of history, instead of singling out a certain type of cause, say, economic, or a cyclical view of the history of nations based on developmental causal models (inadequate to the complexity of the mesoscale), or seeing history as the unfolding of the Hegelian Idea, we should perhaps only employ these causes only as restraining features on the serial process, which may itself be the real nerve of the historical process.

ANTHROPOLOGY -- There are striking similarities in the implements and technologies of various peoples around the globe in paleolithic and neolithic times, who also shared the habit of building large stone monuments in similar configurations (both sky-oriented and otherwise). These include the stone builders of the Red Clay people around the arctic rim, neolithic northern European peoples, the cultures of Egypt and the Mideast, Southeast Asia and the South Pacific, South America, Africa, and, according to some, legendary Atlantis. These similarities have given rise to much speculation concerning the spread of various peoples around the globe in those ancient times, guided by the general assumption that they must have started in one place and spread out to the rest of the world.

However, according to the serial view, these similarities may have arisen independently through the medium of persistence causality. They may be regarded as simultaneous serial imitations of some common event, well back in the common history of the different peoples when

they were all the same stock, in which case little could be inferred about the spread of the peoples from the artifacts. Alternatively, according to the laws of analogical seriality, the common event could even have been some relatively global, inanimate event such as a mountain raising episode. The imitation of the forces involved in this originating event could manifest as an impulse to erect stone monuments, not necessarily arising as a clear intention in the mind of an individual, but subliminally organizing the efforts of a community.

If this is true, all kinds of "ancient astronaut" and "mystic Egyptian" theories may be laid to rest, and warring anthropologists and archaeologists may bury the hatchet in the knowledge that at least in part, they all are right.

ANIMAL BEHAVIOR OR ETHOLOGY AND FORTEANA -- The category of strange, unexplained phenomena has come to be called "Forteana" after 19th century naturalist Charles Fort, who along with others like Sir Arthur Conan Doyle, Bernard Heuvelmans, Willy Ley, and Ivan Sanderson collected voluminous lists of strange happenings and coincidences that seemed too bizarre to admit to ordinary explanations. These included frog and fish falls from the sky, multiple sightings of unusual animals, strange meteorological phenomena, and so on.

A number of modern examples have been cited to support Rupert Sheldrake's theories of "morphic resonance," kind of an updated version of the ideal shadow-forms in Plato's cave manifesting in physical reality on earth. For instance, little birds called blue tits seemed to learn how to open milk bottles on people's steps all over England simultaneously, even though they were of different sub-species with non-overlapping ranges and thus could not have taught each other to do it. It just occurred to them all at once, which Sheldrake attributes to their sensitivity to some newly-formed etheric morph. Similarly, when rats are taught to perform a maze in Los Angeles, their unconnected counterparts in the U.K. suddenly can do it with ease. According to Kammerer's plan, that's completely logical. When an idea's time has come, it literally and figuratively has -- it just surfaces all over the place, following its masked antecedents.

Kammerer himself got caught in this one posthumously, when experiments to prove inherited characteristics of learning were abandoned when it was discovered that all the subject animals, experiment and control alike, had learned equally well to do the tasks allotted, whether they'd been trained to or not! Of course, this is why people invent the same thing at the same time, independent of each other -- it surfaces in the information matrix in multiple places, but flourishes only in the most fecund spot.

EPIDEMIOLOGY -- Experts at the Center For Disease Control have recently been modeling their theories of epidemic recurrence on the new nonlinear dynamics, which can explain how--even with the environmental parameters and population density constant--some of the wild swings in numbers of cases in diseases from year to year are a natural result of the recursive mathematic laws governing their spread, without having to search for specific new causes for the peaks in epidemic years. This is already serial thinking of a sort, although (as explained in chapter 7) such models only account for the nonlinearity of the persistence of events.

The possibility of simultaneous seriality would certainly complicate the picture, since new disease strains could appear in different places at the same time. That is, the "random" processes responsible for mutation at the genetic level may simultaneously configure in the same way in different locations, each configuration being an imitation of the force constellation responsible for some earlier event in the environment.

Kammerer's ideas of collateral seriality at different scales then offers the somewhat frightening prospect that some of these genetic mutations may actually be imitations of events at the level of our social life, of our collective fears and behaviors, which come back to haunt us via plagues. Although these may seem like divine judgments to some, it may more properly be regarded as an example of series scaling down, apparently dropping out of sight, only to return later to the original scale in a different but related form.

Fortunately, the cures for such diseases may arise with the same spontaneity and simultaneity, perhaps even with serial histories resembling those of the diseases themselves.

In a similar vein, rashes of murder, suicide, and antisocial behavior often seem to crop up simultaneously in different places, with no traceable interaction. If these have a serial nature, they may be re-enactments of crimes in the past, although we may instead have to look around in unsuspected areas for the initiating event, which (according to the analogical range of seriality) need not be psychological or even social in origin. Who knows, it may even be something like destructive acts on indigenous animal populations or the environment, come scaling back down to meet us. This puts a totally new spin on the term "serial crime."

EVOLUTION -- Simultaneous seriality can again team up with succedent seriality to account for the pattern of evolutionary change apparent in the geological record. Biological evolution does not seem to happen continuously, but goes in spurts, and most genetic scenarios have a hard time accounting for radical change in a short time.

The current model for this "punctuated equilibrium" requires very special circumstances: a very small, isolated population suddenly opened up to the general population at exactly the right time and under exactly the right circumstances. The rarity and accidental character of these conditions calls into question the ability of the model to account for the degree of evolutionary change actually recorded.

Seriality has two advantages over this model. First, as is perhaps best seen by our Poincare transform model for serial repetition, a certain combination of genetic material may not be simply a unique occurrence never to be repeated, but may happen with considerable, though well-spaced regularity, thus insuring that the mutation in question will have more chances to leave its mark on the gene pool. Secondly, the model suggests that a number of these mutations may happen simultaneously, thus giving this particular subset a better chance to survive. The fact that a large portion of DNA is not physically manifested but "language-structure" oriented would argue for the plausibility of just such an internal mathematical model.

Of course, it is also possible that persistence causality is acting in concert with ordinary causality here, and that both models are correct. In phenomena that combine seriality with causality, we must locate and isolate the serial contribution.

WEATHER -- It is the current wisdom of chaos theory that weather cannot be predicted because of the "butterfly effect" discovered by Edward Lorenz while he was doing computer weather modelling in 1961. He found that the slightest change in initial data in his simulation program would not even out over the prediction run but would quickly spiral out of control creating radically different results based on barely distinguishable starting points. The metaphor was that if a butterfly flapped its wings in China, the weather in the U.S.A. would be affected.

However, Kammerer refers to a German weather forecaster who had better than average success by predicting that the weather tomorrow would be the same as the weather today. It sounds

like a gimmick, but it does point to the existence of an inertial component to the weather. But where is this to be found?

The now-famous Lorenz attractor, sometimes invoked in weather models, may give us a hint. It is called an attractor because the weather tends to remain in the set of states that this attractor comprises. This complex figure has two "branches." One branch may represent a state of glaciation. Although there is no apparent persistence or pattern of the weather as long as it remains on either branch of the attractor, there is still a tendency for it to remain on one branch rather than another. It takes quite a knock to the system before it will leave one branch and take up residence on the other. Thus, we may consider the system to have a certain persistence after all.

Now carry this thinking one step further. Suppose we had a multi-branched attractor, each of whose branches represented a different type of weather: drizzle, sunny and breezy, sleet, etc. Presumably there would be a similar inertial tendency for the system to remain on each branch, except it would be considerably easier to knock it over to another branch than it was in the case of the original Lorenz attractor. If we studied the meteorological causes that could so perturb the system, and understood well the "basins of attraction" for each branch, we could perhaps considerably improve our predictive powers.

The problem may be that we are looking at the wrong scale. The Lorenz model is based on the equations for fluid flow, which involve variables like viscosity, convection, etc. If we worked back from our hypothetical multi-branched attractor to the variables that would have to compose it, it is our guess that we would find ourselves in a system where seriality prevailed.

On the other side of the coin, when a less-than-stable system is at a branching point, it may switch wildly back and forth until it has established its final path. Although previous global weather changes have been thought to have been fairly gradual, some recent interglacial periods now show catastrophic variation of as much as thirty degrees worldwide several times over just ten thousand years.

PHYSICS -- As previously suggested, if these are mesoscale effects only and there is an upper and lower limit to them, quantum physics and astrophysics may escape unaltered(then again, they may not). Everyday physics will have to sort out the difference between ordinary causality and persistent causality and find out if there are identifiable "attractors" for the latter, as we think there must be. It will further have to deal with the physical reality of information and its motion as opposed to the physical manifestations that carry it. At what speed does it move under what conditions? This will be necessary in order to make the use of seriality a predictable and practical art. There is also a space-time problem that often arises when seriality and ordinary causality meet in which space may be traded for time and vice-versa which, among other things, suggest more than a single dimension for time. Can things move sideways in time, or are such anomalies purely serialistic in character?

HOMOEOPATHY -- BOB DOES REWRITE HERE-----A somewhat controversial experiment has suggested that when various dissolved substances are shaken in water, diluted, and shaken again, they may be leaving a kind of imprint in the water itself. This seems to follow because the process can be continued until it is highly unlikely that there are any molecules of the solute remaining in the water at all, yet it continues to cause the same--or even a heightened--reaction in certain organisms. This is the principle behind the preparation of homeopathic medicines.

Some researchers have speculated that the effect is due to the creation of stable mega-molecules in the water through the agency of hydrogen bonds. These polymer-like molecules are supposed to be characteristic of the particular solute. We would refine this explanation somewhat by first noting that these large molecules in the water may form a kind of mesoscale between the individual water molecules themselves and the masses of water at the bulk level that move and partly cohere through convection and conduction. Instead of insisting on the creation of stable mega-molecules, it is possible that we have a constant formation and dissolution of such molecules through the rather weak hydrogen bonding. Nevertheless, the overall configuration could persist in much the same way we described for the persistence of a body complex. And this may be the way in which the water "remembers."

ARTS & MUSIC -- Motifs and protostyles with lives of their own: Country music has often been accused of "sounding all alike" by its non-fans. So has rock 'n' roll, heavy metal, jazz, Latin, and so on. Each has reached a period of apparent or temporary equilibrium as the various imitations of certain seminal songs mutually influence one another, attract similar material from other music, and become progressively more alike to form a body of songs we call a style. The outsider sees only this overall sameness, but the insider is tuned in to the momentary and shifting differentiations and clusterings that make up this uniformity, and which can make one record stand out above the others and become a hit. The hit, of course, is more closely faithful to the primary serial components while elaborating upon them with incoming streams. The miss stays too close for interest or is too far from the center to draw on its collective power.

Of course, sometimes several songwriters come up with the same tune and copyright suits are joined. Did George Harrison knowingly steal "My Sweet Lord" from the Ronettes' "He's So Fine," or was he just picking up an echo structure from a reverberating wavefront? The court thought the former, but Harrison denied it, as is usually the case when unknown authors pop up and claim they wrote most of (or the concept of) the latest hit tune, box office smash, and so on. Occasionally, even themes by great composers seem to have been "unconsciously influenced" by the works of their predecessors. Although plagiarism does indeed exist, a fair portion of it may be simply seriality in action. One composer may pick out a certain fleeting differentiation within the style, which later surfaces momentarily in serial fashion only to be noticed by a second composer.

A personal example: one of us (JT) recorded a song on Vanguard Records in the early 1970's entitled "Just Another Day." The week it was released, Paul McCartney released a song of the same name, then quickly re-released it under the title "Another Day," to avoid confusion. Guess who got the hit? Oh well...

Eventually, the differentiation phase of the attraction hypothesis takes effect and new styles arise very suddenly, taking the populus by storm, while other more deliberate and well-promoted attempts at artistic innovation fall on deaf ears. It would seem that these new differentiations are apparent to the public at large, so that they can anticipate with eager expectations a certain type of song, and appreciate it when it is composed. Do we see information fronts surfacing here as well?

We might make a similar analysis of the success of other fads and fashions. Why else did the hoolahoop "catch on?"

GAMBLING -- Well, don't look to win the lottery right away, but perhaps you should reconsider the direct use of probability and statistics. Seriality tells us what will tend to happen in an individual context if it is not impeded by outside forces, rather than what will happen for the most part if we average out the effects of a multitude of individual causes. After all, the gambler is

right next to the serial process, seeing the individual causes involved, and making a short term prediction about whether an event tends to recur. In this regard seriality may be compared to chaos theory, which can in principle determine what will issue next, employing for that purpose a deterministic law that produces events that appear stochastic and random, hitherto subject only to probabilistic law.

The successful gambler does all this intuitively, by the direct but subconscious perception of the serial process. He knows instinctively when the complex of people and objects at the table momentarily comprise a system isolated from the rest of the environment, so that its serial tendencies will not be impeded by other forces intervening. He senses when the cards represent the "inertial center" of this system itself, and then follows the run of cards. He reads not just the cards, but the people, the music, etc., and knows when some apparently unimportant and unrelated event signals the end of the isolation of the system, and the breaking of the streak. Then he folds. If he is very canny, he may even know how to do things to make his luck, how to give a certain twist to the serial process, etc.

This same kind of pattern is commonly intuited by successful professionals in a variety of areas in which science now applies (or attempts to apply) only probability and statistics -- the stock market, politics, and advertising demographics, to name just three of the most obvious.

CRIMINOLOGY -- What is a mystery but a set of seemingly unrelated clues which, when attached to a unifying stream of events, leads to a hitherto unrevealed reality? Like the gambler, the good detective goes on hunches, small cues that point to a less-obvious thread of deduction that unravels a hidden skein of events. As in many a real-life and fiction story, the stranger and spookier the clues, the closer the sleuth gets to the solution. It is as if the private (or public) eye is penetrating closer to a vortex of seriality emanating from the crime and its surrounding events. Charles Fort even wrote a very engaging detective story following just this line of reasoning. Sherlock Holmes might have frowned on it, but A. Conan Doyle would certainly have approved. Modern forensics might look to this kind of analysis for another tool for the good guys.

PARAPSYCHOLOGY -- Then there is the generally ineffable. The phenomena covered by the paranormal have been with us since recorded history. What they are, and whether they are real, are still matters of acrimonious debate. Debunkers would dismiss them all, while the explanations of believers range from the most unnatural flights of scientific fancy to the most fervent and antiscientific invocations of supernatural agencies. Leaving aside mere conjecture and appeals to the transcendental, this heading does include a number of disparate phenomena which--assuming they are genuine--may be explicable by various applications of seriality. To mention but a few:

For Kammerer, cases of telepathy and precognition represent homological and analogical series respectively. In most of these cases, it does seem possible to rule out any exchange of information, which is the only thing, other than mere chance, that we have hitherto allowed for explaining why one mind takes on the same thought as another, or the fashions the image of some external event not present to it. This is what makes these occurrences seem so unbelievable to many people.

But no exchange of information is required if one event is the serial continuation of the other, or both are continuations of the same event. No matter need to change hands between the two subjects, no energy differential needs to be equalized. The laws of seriality are directed at sameness of structure. The larger body complex to which both the participants belong is simply seeing to it that the repetition of a certain structure takes place. It makes no difference whether the

bearers of that structure are minds or natural objects. The persistence of the body complex can arrange for a subliminal suggestion, entrain a natural association process, or otherwise plant a thought just as well as it can orchestrate a natural event.

In the case of precognition, we do not mean to suggest that a dream of a fire and a subsequent actual fire, to take an example, are both totally due to a serial repetition of the same event. We must consider that the dream would not be of the fire per se, but of events occurring within it, such as timbers falling on people, a child crying, smoke billowing etc. It is only these events that are like the dream, and the one repetition would be taking advantage of the fire to stage a repetition of some similar scenes only.

We are reminded of the highly suggestive remark of Aristotle that the mind is somehow all things. When the mind knows something, it becomes identical to it in form. If this can happen through perception or intentional activity on the part of the mind--that is, if we can know anything at all--why is it any less likely that analogical or homological forms could arise in the mind according to the dictates of seriality?

In general, greater sensitivity to seriality may be what much of psychic phenomena and spirituality is all about. If one could follow ordinary events just one more step either above or below our normal "bandwidth of perception," how much more expanded our consciousness would be and how much greater our understanding of our place in the world.

GHOSTS & APPARITIONS -- If one of the principal actors in a highly persistent series is entirely removed from the system, the system will tend to replace it with a substitute as best it can.

The following anecdote illustrates this property. An employee of a small company had the job of answering a hotline that was equipped with a recording and message machine for times he was out of the office. For the entire two years he worked for the company, the phone never rang between the hours of 8:00 A.M. and 8:15 A.M. The phone was located in a room in which Friday morning company meetings were held, which everyone attended. During one of the business meetings held shortly after this fellow had left the company, the phone rang, and since no one answered it, the message came on, and the voice of the former employee sounded out throughout the room, quite loudly because someone had apparently turned up the volume on the answering machine to full. Oddly enough, this happened a second time during the same meeting. It was as if the system had conspired to imitate the presence of the former employee as well as it could -- a true ghost in the machine!

A similar argument might account for many of the reports of ghosts, particularly the regularly recurring variety. When someone who is at the center of a highly persistent event complex is suddenly removed, the system may try to restore the presence of that person when the time comes round for an intense peak in the serial process. The system may assemble fog, light reflections, various naturally occurring noises, even plant suggestions in the minds of the observers in an effort achieve a perfect repetition of the initial event.

MAGIC -- Isn't this simply the art and practice of entering into the world of seriality to initiate a series with a desired outcome? Unlike famous illusionists, real "magicians" and shamans do not attempt to move mountains or make the Statue of Liberty disappear. They try to effect changes at the level of human events, likely by tapping onto serial currents which may be nudged in a desired direction with geometric effects in relation to the effort put out. The often-associated trance-like states required may be simply a method of de-focusing on the obvious bandwidth of information and allowing broader information to be perceived and acted upon. Similarly, the

general usage of spells and repetitions may represent the attempt to add an additional input to the inner serial structure of the situation. A study of some of these practices could reveal quite a lot about the relation of seriality to causality.

MANTIC & ORACULAR DEVICES -- One of the most subtle types of seriality is that of correlated series. These result when the individual members of two independent trains of events come together in step with one another and act as if there was a single series with two common unlike features in the repetition. It is a case of two independent series imitating a given, single series, and is a kind of mimicry on the part of nature. This is not to say that these correlations are illusory. They are not. They are merely imitations of imitations.

Most of these correlations would be quite short lived. For example, it may happen that you stub your toe three times on a given day, and each time an ambulance is passing. However, the apparently random sequences produced by mantic devices such as tarot and the I Ching seem to have a strong tendency to correlate with events of a characteristic kind.

SACRED PLACES -- In any body complex there may be certain islands of stability which are left relatively untouched by the continual transformation that forces the remaining bodies to wander all about their "world." In fact, there is another topological theorem by Poincare, called the fixed point theorem, which states that when all the points on the surface of a sphere are subjected to a topological transform, there is at least one point that transforms onto itself, and thus remains where it is. Here we suppose that there are certain regions that remain virtually unchanged for long periods of time. We might say that these island subsystems have a rather low capacity for spatial adjustment, for mingling their contents with the outside environment. The full range of seriality would have free play within these islands due to the heightened spatial and temporal persistence. Perhaps this is a factor in the "magical" character of many of the ancient sacred places.

A further aspect of this may arise from the attraction hypothesis. If like forms -- of information or emotional state, for instance -- tend to attract each other, then any one spot imbued with a given form would tend to attract those similar. The least mobile (a location, building, icon, etc.) would tend to be the primary attractor. Perhaps even a single incident (as that at Lourds) can over the years gather enough repetition through attraction to build a formidably stable and consistent focus. One needn't go as far as Lourds or other holy sites and miracle centers for example. Just recently a cylindrical cement traffic obstruction with a rounded top (like most that block the ends of dead-end streets and the like) appeared in the middle of San Francisco's Golden Gate Park. Probably it was dumped off the back of a pickup by guilt-ridden joyriders. Its mysterious placement in the middle of a copse of trees, along with a shape virtually identical to the depiction of the age-old Shiva lingam (erect male member), immediately brought on a growing host of New Age neo-spiritualists, who began covering it with flowers, milk, honey, and other sacrifices. A few months of chanting and incense-burning brought it to the attention of the traffic department, who were about to forcibly remove it when a national TV tabloid program interceded and procured it for the new lingam worshippers. Now it has become a shrine and, as one of its devotees proclaimed in very serial fashion, "it gains strength daily." As it should, no doubt...

RELIGION, SPIRITUAL STRUCTURE AND RITUAL -- Similar to the alleged power of magical invocation, the power of prayer is widely viewed by the faithful as having direct effect upon human (and sometimes non-human) events. Sometimes it is explained as simply being sufficiently convincing to an appropriately empowered deity who can deliver the desired effect. More

sophisticated theorists break this down into the semi-physical idea of “thought-forms,” which when created with enough force and insistence actually go forth and have effect on the environment, especially at their own specific, semi-physical level and wavelengths. The whole idea is best expressed in works on Theosophy, a 19th century spiritual philosophy with strong ties to esoteric Buddhism, much of the tenets of which have been taken up by many New Age disciples.

Such views more than smack of seriality and may be an attempt at reaching that middle ground between physical, “causal” science and the obvious anomalies created by toeing the laboratory line too closely. Indeed, when religion and science split up a few hundred years ago, one fled to earth, the other to sky, leaving most of us awash inbetween. Theosophy, along with some other relatively recent spiritual and psychological movements (Steiner, Eddy, Reich, Swedenborg, for example) have made valiant attempts to bridge this gap with a universal continuum that includes both science and religion, though their origins betray a distinctly religious slant. What Kammerer envisioned may be viewed as the attempt to do this from the scientific side, especially in a computer and information-crazy world. Are the increasingly finer aspects of reality, from the etheric world to the soul and spirit their own kind of ectoplasm, or are they the persistent body-complexes of information that pass in and out of our consciousness while refusing to ever really die. Seriality is, in its own way, a description of spiritual (and indeed even physical) immortality, changing and developing with evolution along the way. For real New Age enthusiasts who want a really good spiritual microfilm machine -- what is seriality, at its deepest level, but the basic mechanism of the Akashic Records, where every event has its trace and with the right method is thereby accessible to all? However far you push it, both Kammerer and most spiritualists would concur that putting extra information and structure into the environment can affect things, depending largely on where you put it and what you provide. The spiritual approach favors prayer and ritual, age-old methods of bending the airwaves, but Kammerer might suggest that much more banal approaches (even things like Sylva Mind Control, which really can get you free parking spaces!) may be just as effective if used judiciously. The more in touch with the gestalt of information around you and the more willing and able you are to interact with it, the more effect you can be, sometimes in seemingly miraculous, but really quite causal, ways. Plus, the serial approach ultimately lends itself to quantification and some degree of general replication, whereas the spiritual approach is ultimately a solo course and has to be repeated and relearned by each highly motivated and talented individual, which limits its value for the many.

ASTROLOGY -- And last, but not least, the old bugaboo that has been hanging around for centuries and engaged some of our greatest scientific minds (Brahe, Kepler, Copernicus, Galileo, Cardano, Paracelsus), and was instrumental in the birth of much of modern astronomy, mathematics, medicine, and psychology. It has fallen on hard times, because laboratory science cannot find 1) proof that it works consistently, and 2) a physical basis for its operation.

We see three entirely different processes at work here, which partly accounts for some of the confusion surrounding it. First of all, there is a strictly causal side to astrology, for which the evidence has steadily been accumulating. The planets apparently regulate solar activity in various ways, producing the variations in the solar wind which have such pronounced consequences on the earth and its life. Furthermore, a mechanism has been proposed (Percy Seymour) by which the planets can have a direct effect on the earth: they can distort the earth's magnetosphere by gravitation, thus affecting the geomagnetic field of the earth itself.

From here on the linkages so far proposed become a bit implausible. We would suggest an application of Kammerer's imitation hypothesis here--namely, that the fluctuating gravitational

influence causes fluctuating geomagnetic cycles which tend to mode-lock other large earthly systems such as land and water tides, weather, geological cycles, etc. These, over the eons, continue to mode-lock smaller systems, not as a single homogeneous unit, but singly by planet depending upon the nearest associated frequencies or resonances (just as different crystals lock onto different radio wavelengths). Over millions of years, multiple series of integrated systems are set up and continually reinforced. So, it should not be surprising when certain events at the mesoscale surface in sync with the return of a given planet to a given position (a transit).

The second process involved in astrological phenomena is just Kammerer's persistence causality, and it explains the natal horoscope. Seriality takes effect after a force-constellation quits acting on a body complex. While in the womb, a baby is still part of its mother's body complex. But at the moment of birth, the baby becomes an independent system, and effectively removes itself from any further endemic influence of the planets. It has, so to speak, locked out the elements of the previous system, and its internal cycles will continue to persist with the pattern of general environmental (especially including step-down planetary) cycles prevailing at that moment, which will presumably reflect on its personality among other aspects. Indeed, the beginning, system-wise, may well be said to be half of everything (as the Greeks put it, or our modern "well-begun, half-done"). Furthermore, from that time on the planets can be used as indicators of the cresting and superposition upon the internal cycles in the person. It also might be noted that natal horoscopes are used almost exclusively for recursive systems (ones that cycle back on themselves and are self-regulating or self-sustaining) -- whether people, animals, boats, houses, businesses, voyages -- which have an additional built-in persistence that is externally intentional as well as internally innate.

The third process operative in astrology is correlation series, as described above in the section on mantic devices. This more subtle kind of seriality may be the dominant factor in horary astrology, in which a question is assumed to be asked at precisely the moment when the proper answer can be given, based on very exact rules for interpreting the planetary positions at that moment. More generally, it may also be a factor in chart interpretation done in a consulting environment. Essentially, similar information structures, above and below, and indeed all around, are there for the taking for those who can ferret them out.

XI. Appendix. Kammerer's Examples Of Seriality

Paul Kammerer based his theory of seriality on years of observations of various types of coincidences and serial happenings, one hundred of which are mentioned in his work. It makes lengthy but stimulating (and often amusing) reading and serves to illustrate further his various classifications in Chapter Four:

NUMERALS

1. On June 25, 1912, I attended a concert in Vienna's Beethoven Hall and occupied a seat in the 18th row. On the following day I sat in the great Music Union Hall, again in row 18.

2 a. My brother-in-law E. v. W. attended a concert in Bosendorfer Hall (Vienna) on November 4, 1910. He had seat number 9, his cloakroom check also bore the number 9.

2 b. On November 5, thus a day later, he went together with me to the Philharmonic Concert in the great Music Union Hall (Vienna) and he had place number 21 (a civil service colleague, Herr R. lent him his season ticket) as well as coat room check 21. In order to rule out any misunderstandings, it must be noted that it was not due, say, to any system in the ticket sales that the place number and the cloak room check number were the same -- 2a and 2b together form a double series. The individual series consist in the agreement of the numbers. These two series, for their part, constitute a series themselves, because they followed one another in so short an interval as one day, and furthermore through the common trait that agreement in both cases is reckoned between cloak room and seat numbers. We will soon discover that even such a grouping of series of the first order into series of the second or even higher order is something quite common, if not regular.

3. On the 2nd of September, 1906, I had lunch at the restaurant Konstantinuhugel, Wien-Prater. The bill came to 1 kroner, 69 heller (15-80-20-40-4-3-7 heller). The same day I had supper in the [seminary] at Klosterneuburg, naturally with a quite different menu. Once again the bill added up to 1 kroner, 69 heller (60-85-10-10-4). It is important to note that individual amounts of 3 and 7 on the noon bill are very uncommon. I no longer know how this came to be, although I have kept both bills as proof for my collection of series.

WORDS & NAMES

4. The "New Vienna Evening Paper" for April 15, 1915, carried the following notice: "Improvident Logic--Someone writes to the Voss Newspaper: A small chance occurrence as food for thought: High above one of our Zeppelins whirs, now again more joyfully saluted than earlier, when we had almost grown indifferent. Before me on my table, opened up at random, is the 'Logic' of Hoefler from the year 1890. And I am reading of concepts that have no correlative objects, whose empirical extension is null, and as the example...the dirigible airballoon! -- With strange thoughts I look up at the hovering flight..." What the onlooker calls "chance,"--namely, that his eye fell upon the homonymous concept in the book before him immediately after seeing the airship that is the expression of that very same concept--for us serves as a non-accidental coincidence of a serial nature.

5. Saturday, May 8, 1915, while riding by in a streetcar near the Hofburg theater, a small boy says, "Mother, that is a church!" -- Thursday, May 13, while pointing to the Vienna Vivarium, a child asks, "Mother, is that a church?" (Communicated by my wife, who had heard it herself)

6. My brother-in-law E. v. W. was asked on May 30, 1909 "Are you not Herr Sebisch?" despite the fact that he was not, did not know anyone by that name, and had never even heard it. The day after he wants to look something up in the statement of the academic authorities. Upon opening the pamphlet his first glance falls upon the name "Sebisch."

7. On September 18, 1916, in the surgical office of Prof. Dr. J. v. H., my wife is looking at "Art." Reproductions of the painter Schwalbach fall under her eye and she undertakes to note the name so

that at some time or other she could look up and view the originals. At that moment the door opens and the attendant asks those waiting "Is Frau Schwalbach present? She should come to the phone!"

8. On May 17, 1917, we were invited to Schreker's. On the way there I bought my wife some chocolate bonbons at the candy stand in front of the railway station. -- Schreker played to us from his new opera "The Marked Ones," in which the central female character was called Carlotta. Having returned home, we emptied the sack with the bonbons. One of them was in a wrapper with the inscription "Carlotta" (here reproduced).

9. On the 9th of April, 1915, I saw the following placards hanging one above the other on the [Monichkirchner Schwaig] (reached from Monichkirchen on the Aspangsbahn, Southern Austria) (Above) Heinrich Rotter, Vienna, Equipment for touring and wintersports (Below) Franz Rottler, Aspang, Liqueur manufacturer

10. In 1915 two soldiers lay in the hospital at Kattowitz. Both were 19 years old, both suffered from a serious lung inflammation, both were from Schlesien, both were volunteer drivers, both were called Franz Richter. The one lies at the point of death, but by mistake the relatives of the other are informed of this, and they hurry to his death bed. However, the similarity of the namesake is so great, that the Richter lying in agony is not seen to be a stranger. Long after the burial, the true Richter announces himself one day to his family as a convalescent. A duplication whose two members have seven features in common: Age, City, Position, Illness, First Name, Last Name, External Resemblance.

11. In the "Austrian Illustrated Review" IV 24 of March 9, 1917, p 670, is found an article "On the [Einkuchenhaus]" by E. v. Filek. "In Austria we have already sliced into the [Einkuchenhaus] question differently. More than seven years ago, Otto Fick, the founder of the first such houses in Copenhagen, spoke of his experiences at the request of Auguste Fickert...."

12. In the "Illustrated Vienna Extra" of Sunday, the 13th of September, 1914, as well as in other papers, is written, "A strange connection of names has been discovered in Goldberg in Schlesien. Namely, a resident of the city is called Emmich and his wife was born Luettich. Together that has a good sound. That is, Emmich is also the name of the German conqueror (much celebrated in those days) of the Belgian city of Luettich. Dependent series, which are tied together into a series of a higher order, consist in the common endings and in consonantal doubling in the middle of the word, even if not belonging to the same consonants.

13. The warring sides of the World War can be read--significantly or playfully according to belief or disbelief--in the fusion of the names of their leaders: the following names repeat themselves if read over again on the left and the right of the vertical dividing sign.

EAST: PUT | NIK
 NIK | OLAI
WEST: JOF | FRE
 FRE | NCH

14. In the "Worker's Newspaper" of February 16, 1917, I read a report about a recitalist [Kammersaenger] Piccaver. Then I make an order from the firm Kment and must enter this into the purchasing book. Just before me something had been ordered for a recitalist [Kammersaenger], and my name now came to stand under his title in such a way that the first two syllables of each line up with one another. -- This series thus advances in the manner of sequential keywords: Kammersanger (Newspaper notice)--Kammersaenger (Order book)--Kammerer (Order book).

15. On July 8, 1916, Marie, cook for W., returns from shopping and now has to push a package to Lieser, Gloriettegasse, in a wheelbarrow. Hilda W. rummages around in the package brought home from shopping and finds the address "Mrs Lilly Lieser, IV. Allegasse" on the wrapping paper. (Gloriettegasse is the summer residence of Mrs Lieser, Allegasse her winter residence.)

16a. Much of what we perceive as active ordering is due to the passive presence of immanent seriality. The material, whether mental or physical, resolves itself in a seemingly spontaneous fashion into distinct groups and rows. This especially happens in ordering processes in which our activity has established a determinate, rigid system of order. However, the things being arranged also group themselves even further under our hands according to another point of view which is either parallel or transverse to our system. Here is an insignificant example of this kind, though meaningful in light of the "passive striving of things for order": I am ordering my correspondence alphabetically according to family name, and now the letters next in sequence, still in an unsorted pile, lie on top of one another in such a way that the writing of a lady with the last name "Lieser" is positioned exactly over the card of my sister-in-law with the first name "Lieschen." The passive serial arrangement, which cuts across my active conscious arrangement, has likewise worked alphabetically, but not relative to the last names, but rather absolutely according to names in general, according to first and last names indiscriminately.

16b.c. A collateral series attached to this series--as said, dependent series are almost constantly turning up, because even the serial occurrence is universal--consists in the circumstance that the cited lady has the first name "Lilly" and my sister-in-law Lieschen has a daughter with the name "Lillie." A dependent series may be recognized in the alliteration "Lillie Lieschen Lieser."

17. Three well-known butterfly specialists bear the names Standfuss, Schaufuss, Streckfuss. -- One notices the parallel course of the series consisting of the final syllable and the initial letter.

PEOPLE

18. Wednesday, July 4, 1917, I proceeded to the inspection doctor's in the chapter barracks [Stiftskaserne] (Vienna, Mariahilferstrasse), to get it confirmed on my leave-pass that I was "infection-free." Upon leaving the barracks, I ran into a lieutenant in the yard, who most heartily greeted me with "Hello! Greetings!" According to voice, manner of speaking, form, stoutness, and face I think to myself: "Surely that's M. W.!" Only I had been used to somewhat more placidity in the latter and knew besides that he already would have to be captain. It was then really someone entirely different, a former companion on the train (Karl Godrich).--Having come home in the evening, I find a (overdue) review of my "General Biology" in the "News of the Austrian Society's

Nature Refuge-park" II, Nos. 1 and 2, and a letter, both from Captain M. W., who, after his transfer to Brunn, had not been heard from for a full year.

19. H. N., married to B., had entirely dropped out of sight. Then my wife encounters her at the sickbed of her sister A. N., married to L., who was seeking a cure for a malady in the Hacking Sanitorium, in the immediate neighborhood of our home. From then on a few purely "chance" meetings follow. My wife meets H. N. while shopping on Mariahilferstrasse (addendum: we never elude the serial course: Mariahilferstrasse likewise occurred in the previous example!), then we both encounter her on May 17, 1917 (cf. example 8) at Schreker's. From here on the meetings turn from the realm of the serial to that of the causal, because the "chance events" had become an occasion for deliberately re-establishing the lapsed acquaintance.

20. On May 9, 1917, I find in an old attic the group photograph of the candidates with whom I had formerly passed my examinations. Afterwards, we had had ourselves photographed together: quite pale, worn-out faces--but Ernst Kraft's elegant gymnast's physique stands out most conspicuously in it (cf. Chapter II Series Type 17: Name and Occupation). On May 10 an occasion arose for explaining to Dr. L. SP. the reason for my strong arm muscles: I acquired them in boyishly enthusiastic rivalry with Kraft at the gymnastic lessons. Early on the morning of May 11 I finally encounter Kraft himself, sitting in a cab, travelling along Karntnerstrasse. I recognize him only after he waved to me energetically, for I have not seen him for four years, and in the meantime he has become--presumably worn-out from military duty--likewise pale and gaunt.

21. On the walls of the "Artists' Cafe"--in front of the University of Vienna--hang pictures of famous actors, singers and musicians. On May 5, 1917, Dr. Tyrolt's portrait catches my eye there for the first time. The waiter brings the "New Free Press," in which the feuilleton "The Crisis in the German Popular Theater" has Dr. Tyrolt as its author.

22. On July 28, 1915, experienced a series progressing in "keywords," (cf. example 14) a.) My wife read about Mrs. Rohan in the novel "Michael" by Hermann Bang. Then she saw a gentleman unknown to her on the streetcar who resembled a friend of hers, Joseph, Prince Rohan. In the evening Prince Rohan came to call. --b.) The gentleman on the streetcar, whose similarity to Prince Rohan had struck my wife, had been asked by somebody else whether he knew Weissenbach am Attersee and could recommend it as a summer residence. My wife proceeded from the streetcar to the sweet-market to go shopping, and there was asked by a salesman where Weissenbach am Attersee lay--namely in which crown land--, since he would afterwards have to mail a package there.

23. I had definitely not seen Prof. F. W. for many months already, although I once had to work weekly in the same scientific institute where he was an assistant. There he wrote "Remarks" against Secerov's and my work in the "Central Paper of Biology" in 1915, p. 176. Still, a considerable time passed before I set eyes upon this malicious critique, which its author naturally did not send to me, because at that time I, in the deepest misery of the World War, did not follow the literature of my field. But from the moment that I had had to read F. W.'s "Remarks," I encountered him unusually often for a time, sometimes in the buildings of the university (but not in his institute!), sometimes in the street: thus Sunday, June 26, 1915, and on July 5 at 2 o'clock in the afternoon at the

Schwarzenbergplatz, on July 7 at 6:30 in the evening in the Operngasse, all meetings taking place in the street quite far from his dwelling and his laboratory.

24. The H. -W.'s on March 19, 1917 in the Viennese Stadttheater. Mrs. E. H. -W. points out to her husband: "Sitting there in front is the singer Lorle Meissner."--"No, that's not her!" replied Herr R. H.; and so again and again affirmation, denial. In the intermission it comes out that they mean two different people: she the true Lorle Meissner, he a lady merely resembling her.

25. Herr O. B. had been discharged from the censorship, but he must have found another position and a lucrative one immediately, for, from out of the window of the censorship I saw him strut along in a magnificent city furpiece, to which his previous finances scarcely entitled him. But from there on Herr O. B. dropped out of my sight, out of my mind. After many months I see a fur cloak hanging in the Cafe Kotmayer, Dorotheergasse (Vienna), which seems strange in this simple popular cafe. That brings up the thought of O. B., how he had always been a little extravagant; for he had once told me that he even had his hair sprinkled and freshened up after shaving, which he needed just for his refreshment. Now, in my mind's eye as it were, I saw O. B. sitting at the barber's, his head wrapped in a towel, which serves to hold fast the smooth, oiled crown. The mental association here went like this: on the one hand I had frequently had to trouble myself about O. B., as long as he was still in an official position; on the other hand it often made me very impatient, when the person before me at the barber's had his head wrapped and made me wait. This procedure, as is well known, prolongs the waiting period, while one was hoping that the matter would rest at shaving.--two hours now after this very important course of thought and recollection in the Cafe Kotmayer I proceeded to the barber, and there O. B. now sat in the flesh, was just powdered and had his towel tied around his head. I would now have to wait for him.

26. Mrs. Grete W. -L. visited her parents on July 12, 1916, and met with a Mrs. NEB. and her daughter, who are by no means frequent or in any way constant visitors there. Even Mrs. Grete W. -L. herself had become by now a rare guest, but she had also met with the NEB.'s several weeks before in her parents house on her preceding visit.

MAIL, IN PARTICULAR LETTERS

27. On August 20, 1915, Mrs. E. H. -W. is arranging zyklamen in a vase, which had been sent to her by Miss M. H. from Wolfgang. But the vase isn't nearly full, for there are too few flowers. Mrs. E. H.-W. thinks to herself: "I could use some more!" Just then the doorbell rings, and the postman delivers a package containing zyklamen picked by Miss GR. K. at her country residence.

28. Early on April 5, 1916, Prof. Dr. F. X. F. inquires at Dr. L. SP., whether he had heard anything of the poster of their common teacher Meyer-Luebke, ordered and payed for in advance at that time by all students of Romance languages, already more than a year having elapsed since then. --In the afternoon Dr. L. SP. finds a box at home with two engravings depicting Hofrat Meyer-Luebke, which the Viennese painter Michalek had executed in 1915.

29a.b. There certainly aren't many countesses in Dr. H. M.'s and my circle of acquaintances. Nevertheless, each of us wrote to one on June 11 (?), 1917: I to Countess Heussenstamm in Matzleindorf at Melk, he to Countess Attems in Zara--It ensued that that the finished letters, laid in

readiness for the expediter, came to lie on top of each other and were put in the mailbox at the same time. In addition the the above mentioned, Dr. H. M. knows only two more countesses: their names--ARCO and ALBERTI--begin alike with A.

30. On January 13, 1917, Miss Felicitas R. lent me an annual report of the Free Community School Wickersdorf, which she had formerly attended. On reading the annual report in the evening I found a letter there in that Miss Felicitas R. had forgotten there and that had brought her--in an earlier time--the following news from her friend Otto and others: "I am beside myself, not being able to speak to you and not to help you in your great need. I can only hope to God that this may be the end of your immense difficulties and misfortunes and I should soon, very soon hold your hand!" For my part I was touched by this letter in that its handwriting exhibited an unmistakable similarity to that of my brother Otto, and that on the same day I--we hardly ever write each other, and indeed even live in the same city--had received a letter from him, which likewise cheered me in a difficult position--the hope arose in me of getting through the apparently still-impending difficulties in a short time.

DREAMS

31. On May 26, 1915, my wife sees photographs depicting scenes of the swimming school in Huetteldorf-Bad. By way of association with this, her thoughts get turned to the foot-corns surgeon of that public baths. --The day after the talkative charwoman of a reserve hospital where my wife served comes running up to her and relates, "Tonight I dreamt your ladyship had cut her corns!"

32. We frequently use blue wax crayons to mark the glasses in which biological experiments are being conducted. Miss Y. FR., who performed assistant's duty in an institute where this was likewise the practice, dreams one night of her brooch with a blue stone: her chief has sharpened the stone and employed it as a crayon.--It was ascertained that her chief, Herr L. v. P., was in fact vexed on the following morning because he could not find any blue crayons and therefore got into an awkward situation.

MEMORIES

33. On September 1, 1907, my brother Otto asks at dinner where Celebes lies. The question was purely rhetorical, for he knew it very well. My sister-in-law Viola answers him with the verse: There was an elephant in Celebes, That saw from far-off what was loved. Otto looks up knowingly: he had read the same stupid verse somewhere on the previous day. It hadn't left his head since then, and this had been the reason for his question.

34. On June 25, 1905, I wrote a postcard to Miss H. D. with a view of the plaster mill, Adlitzgraben in Semmering (lower Austria). For some reason that slipped from my memory, I put on this card the poem of Hugo Salus that intellectually lay far from me, "The Wonderful Tear": This jewel, King, spake the pilgrim--I have brought for you from the holy Grave... At our next meeting the Miss H. D. calls out: "Have you then also read the beautiful poem in the plaster mill?"--"In the plaster mill?" I ask astounded, "I was never there at all!"--The thing got clarified by learning that

this poem had been written with a piece of coal on a wall of the mill. Miss H. D. had made an excursion to the mill itself shortly before, and had read it there. But in my then later trip to Semmering I had only "by chance" chosen a picture postcard of just that plaster mill and had written just that poem on the card from an "unclear" motive, which showed itself belatedly as a serial impulse.

35. On December 23, 1914, I had in the morning followed as my [daily] melody the motif of the Siren's chorus from "Tannhaeuser" (Act I, Scene 1: "Naht euch dem Stande, naht euch dem Lande") with the characteristic ninth on the penultimate syllable. In the evening of the same day I began to collect and to sift the remarks concerning series that were scattered in my notebooks. These notebooks are in no way specially devoted only to individual things, but rather contain a smorgassboard of everything that comes to me in a flash and seems to me worthy of noting down. Just as I was opening up the oldest (1903), which does not yet note any series at all and hence shows itself upon perusal to be not needed for the aim of the present book, I found in the upper left-hand corner of the page opened to by chance that very motif, which I had jotted down at that time for some reason I can't recall today.

MUSIC

36. Miss B. W. tells of her performance, which she completed at Freiburg in Breisgau in July 1912 and June 1913. Both times a lady living there who was friends with Miss B. W., leaving the theater in her company, hummed the principle theme from Schubert's Symphony in b minor. Of course, there was a definite reason why this motif had become a favorite melody. But we do not sing even a favorite melody incessantly, and not necessarily when we set foot in the same place with the same person after the course of nearly a whole year.

37. On July 29, 1915, my brother-in-law E. v. W. hears an aria from "Rigoletto" at the cinema. Having come back home, he wants to play it on the piano, whereupon it rings out simultaneously from a piano across the way from the house.

38. The "Grotto cars" and some of the merry-go-rounds in the Prater in Vienna have powerful orchestrions with rich repertoires. Of course, each such orchestrion also plays pieces that likewise occur in the repertoire of the others, but in extent and in variety the selection is nevertheless a very abundant one. But on August 11, 1913, wanting to make my way where I wished, I strolled through the Prater's grounds. From all the instruments, at least four times, a great aria from "Tronbadour" was played to me.

SCIENCE

39. On July 3, 1906, Privy Councillor Prof. Dr. M. Gomperz from Voeslau at Vienna inquired of Prof. Dr. H. Prz. by letter whether the assertion made by Aristotle concerning the regrowth of eyes in blinded young swallows is founded upon the truth. On July 6, 1906, his son, Privatdocent Dr. H. Gomperz from Hietzing in Vienna inquired of Prof. H. Prz. by means of a postcard whether crocodiles in fact move the upper jaw in chewing, the ancient logicians having cited this as the

chief argument against the induction that all animals move only the lower jaw, since it is so for the mammals. Separate questioning of Dr. H. Gomperz established through his answering card of July 9 "that I first came to know of the existence of a correspondence between my father and you, after my question had already gone out. I am then even more alarmed over the bother caused you by our family than I was surprised by the strange coincidence."

40. On May 26, 1908, at 11:30 in the morning Privatdozent Dr. Karl Linsbauer asked Herr L. v. P., whether he knew anything of branched root hairs, he (Linsbauer) having found some. L. v. P. knew nothing about it as the botanical literature up to that point in fact contained no statement of that kind. On the same day, at 5:30 in the afternoon, Prof. Zach directed the same question to L. v. P., since he also had observed branched root hairs. The serial character of this double inquiry is strikingly confirmed through the fact that it afterwards comes out that Linsbauer's observation was correct, while that of Zach was mistaken.

41. In a conversation with L. v. P. on October 31, 1911, Privy Councillor Prof. Dr. J. v. Wiesner throws out the question of how it happens that no lichens thrive in large cities; one ought to experiment with cultures of these. The next day, thus on November 1, L. v. P. is sent a work by Nemeč, "Concerning Lichen Cultures and the Influence of the Air of the Laboratory."--With this and the previous series should be compared what was said in our introductory remarks about the duplication of discoveries.

42. On March 4, 1916, Dr. L. Sp. "accidentally" learned of the personally insignificant fact that a Prince L. suffered from Incontinentia alvi (expulsion of excrement through the abdominal wall). At this time Dr. L. Sp.'s father, ill with Incontinentia urinae, got a nurse. Earlier she had been in the service of Prince L. and latched onto the similarity of the names of the two "incontinentes," speaking likewise of the Prince and his illness. After Dr. L. Sp. had, as mentioned, already learned of this outside the house the day before, he was also witness on March 5 to the conversation that the nurse had with his father.

43. In 1902 Councillor Dr. J. KAUDERS (Vienna)--an outstanding internist, as is well known, with whom surgical treatments are thus rarely necessary--had two female patients in the course of a week who had sprained the right wrist under corresponding, peculiar circumstances. They had fallen down from the stool they had climbed up on in order to wipe the dust off a picture, holding their right Hand in front of them. Councillor Kauders related to me many other cases from his practice where illnesses usually rare for him were treated two or more times within a brief interval of time, but neither before nor then after.

CASES OF MISFORTUNE AND DEATH

44a. When Dr. K. Prz., Professor of Physics at the University in Vienna, spoke of Curie in his lecture on "Radioactivity," Curie met a horrible end (killed by accident during an experiment). And when K. Prz. was preparing his lectures on "Theories of Gases," just as he was dealing with Boltzmann's ideas, Boltzmann also came to a horrible end (through suicide).

44b. The communication of this series again forms a further series with the following case of duplication, communicated by the press ("Vienna Afternoon Paper" of September 12, 1906): "Someone wrote to the `Leipzig Daily Paper': The suicide of the famous physicist Boltzmann creates an even greater stir, since it took place a few weeks after the suicide of the Berlin physicist Drude, an example of that remarkable duplication of cases, which plays a certain role in medical superstition."

45. In the holiday resort in 1906 (at Goisern, upper Austria), an old spinster, Baroness Trautenberg, born in 1846, is gravely injured by a falling tree. In the same summer at Kindberg (Obersteiermark) the unmarried Baroness Riegershofen, likewise born in 1846, is also endangered by a falling tree in the woods.

46. (Newspaper report:) "The law of series is confirmed once again in a frightful way: Les Ponts-de-Ce, Spielfeld, Gnesen! In the close interval of a few days three cases of railway deaths..."

47. ("New Viennese Journal" of June 11, 1914, under the heading "A Survivor of the `Titanic' and of the `Empress'"): "Telegraphed to us from London under yesterday's news: Among those rescued from the `Empress of Ireland' at the landing in Glasgow yesterday there was conspicuous a still quite-young man, in whose face however deep traces of sorrow were engraved. He is Wilhelm Clark, the sole survivor of the two greatest shipping catastrophes of the world. He was a fireman on the `Titanic.' On his first stint after the `Titanic' catastrophe he was again made a fireman, this time on the `Empress.' `To have a misfortune twice in the same position,' he said laughing, `we seamen consider fatal, but nevertheless I keep on heating.'"--Obviously the series does not rest upon the fact that Clark made both and even later trips as a fireman, but upon the fact that he was the only one who survived both catastrophes of the most gigantic steamboats.

48a. The supplement of the "Worker's Newspaper" Nr. 140, p. 5, Vienna, Wednesday, May 23, 1917, reports that the Hungarian city of Gyoengyoes was totally burned down, everything in it being reduced to ashes: "The city had already been visited by a catastrophic fire 12 years ago, and at that time more than half of the houses were sacrificed to the blaze." It is true that in Nr. 140, p. 5, on May 24, the "Worker's Newspaper" enlarged upon its report as follows: "Unfortunately, the architectural style was such as to feed the fire abundantly. That is, innumerable narrow and blind alleys empty into the broad asphalt main streets, and in these alleys the houses stand back to back without firewalls. The heat and the smoke generated were so intense here that the fire-brigade was not able to make its way through. Also, the firefighters were lacking in water. Significantly, the urban district that was burned down in 1903 (thus, that makes 14 and not 12 years, as reported in the first notice, or was the fire of 14 years ago a third fire? Author's notes) and rebuilt according to new building specifications, has remained untouched by the fire." Nevertheless, Gyoengyoes is no unique example with regard to its building style, which it shares with other Hungarian cities. Thus, the building style as common cause of both fire catastrophes does not explain why Gyoengyoes was the victim each time.

48b. The day before the burning down of Gyoengyoes in Hungary a second catastrophic city fire took place, namely at Wischau in Maehren. According to the "Worker's Newspaper" of May 22 and 24, 1917, around 60 objects in it fell victim to the flames, among them the prince bishop's palace, the Meierhof, the town hall, and the brewery.

49. The "People's Tribune" XXIV 45, Vienna, November 10, 1915, p. 5, reports: "Picture of war.-- A common death from one and the same shot of a Russian gun found the twin brothers Friedrich and Gustav Frey from Pr. Holland in October of this year. In a fight in the battles for Brueckenkopf one grenade struck and killed both brothers..." The case is also of significance for the theory of periods. Several authors (Fliess, Schlieper) are of the opinion here that near blood relations are connected by a common destiny, so much so that they are affected on the same day by accidents, sicknesses and by natural death. Even external blows of fate and violent death constitute no exception since they tend to overtake men on a "critical" day *minoris resistantiae* [of least resistance]. But "critical days" are the peaks of periods, and near relations are subject to like periods that run their course and culminate on the same days. The fact that we must guard ourselves from generalizing this explanation, which is surely adequated in many cases, is shown by the example in question: did the grenade by which the brothers and surely many other soldiers near them were smashed to pieches seek out one of their days of weakened force of resistance? Similar considerations obtain for example 45, where falling trees injured two old baronesses, in which, according to the theory of periods, the same yearly periodic wave could have been due owing to their common year of birth. But do trees trouble themselves with that?

CRIMES

50. The "Foreigner's Paper" Nr. 111, p. 10, Vienna, Friday, April 21, 1916, reports in the judicial hall column under the heading "Who will buy my child from me?" that in the night of January 3, at various pubs and coffeehouses of the third district the completely drunk temporary worker Franz Kouzelka offered his two-year-old son for sale, and finally as a gift, nevertheless in vain. Finally Kouzelka laid the child on the street pavement of Schlachthausgasse at the entrance of house Nr. 21, where it was found by an artilleryman who took it with him. "Precisely when the soldier with the little one passed by house Nr. 2 on Markhofgasse, the housekeeper opened the door there for someone returning home. The soldier wanted to ask the housekeeper to take the child quickly into warm shelter, but the man returning home explained, he wanted to take the boy himself and carried him into his home. This man was, as it turned out, Kouzelka himself, who had laid down his sleeping child and had found him again upon coming home through a peculiar chance...."

51. ("Vienna Afternoon Newspaper," 55th year of publication, Nr. 107, Friday, April 28, 1905.) Furthermore, the course of the murder trial of Franziska Klein, in which deaf witnesses kept coming forward to testify, might well be reported in all Viennese papers with the same wording. For example: "The engraver Theodor Goldfinger is likewise deaf.--Defender Dr. Elbogen: The law of series."

52. ("New Viennese Daily Paper" of February 8, 1906.) In the feuilleton "Parisian Chronicle" by Fred there is a report of a modern witchcraft trial. Jeanne Verber, a working women, was five times in succession a witness to the deaths of her relatives' children, which is always one of suffocation amidst convulsions: on March 2, 1905 at her sister-in-law's (Georgette), on March 11 at her home where she took care of a niece (Suzanne), on March 25 at another sister-in-law's (Germaine), on March 29 her own son dies, on April 5 the eleven-month-old Maurice of a third sister-in-law's during a visit at Jeanne Veber's. So powerful is the impression of this many-membered series on the

relatives, and so little are they able to understand the horrible events other than through the action of some common cause, that they bring action against Jeanne as a child killer. However, the motive is lacking, the psychiatric examination shows full mental health, not even hysteria, the accusation is convincingly refuted.

53. ("New Free Press," Vienna, Morning edition of Wednesday, September 15, 1905:) "The attempted murder in Heidenreichstein confirms the serial law of criminology. It is the third case in half a year in which a half-grown youth, an apprentice, treacherously and thievishly attacks a lady of the house. The hold-up of the errand boy at the jeweler Skakalik's followed the murder of the carpenter's apprentice Heiny. For Fenzl too, the imitation of criminal examples is undeniable.--Of the last sentence it is only to be remarked that the word "imitation" should not be taken not in the sense of conscious emulation, but of unconscious copying under the impress of the law of series.

STREETCAR JOURNEYS, TRAVELS

54. Frau E. H. -W. is riding in the motorcoach of the Viennese electrical streetcar (60th line), supporting her arm on the window frame, but finds its wood so heated up by the sun so that she mentally poses herself the question: "Is the axle-tree overheating? Is it perhaps burning?" A moment later there is an interruption of the trip: the streetcar train in front of this 60th was on fire.

55. Further city and streetcar observations: on May 24, 1905, 9:00 in the morning, I traveled in the no smoking car 2nd class from Hacking (suburb of Vienna) to the central toll exchange. The whole time (1/2 hour trip, 13 stations, counting the departure & final station) the car was exclusively occupied by men. Another time--in the same 9-hour trip--it is predominately old people, again another time predominately young pretty ladies. Yet another time remarkably many gentlemen get on who had evidently bought new hats, as they carried them in papersacks with the imprint of a well-known Viennese hatfirm.-- My wife & I get on the electric streetcar at Karlsplatz (Vienna); we have exceptionally many bulky packages by us containing dogfood, wadding, toy, a great carryin pouch with the imprint 'Gerngross'. Through this we inaugurated a series, in consequence of which most passengers henceforth--note, it was at a late evening hour, long after business closing and by no means in the Christmas season or any such thing-- carried large and numerous packages.-- Another time we both sat alone on one bench; all subsequent boarders sat down on the bench opposite us and all were in mourning (they did not belong together; in general I ask the reader to presuppose that I here set down a series as such only when sources of error so close at hand have been excluded).

MISCELLANEOUS THINGS AND EVENTS

56. On the 29th of September, 1905, my mother sat on a bench in the Vienna City Park. One by one, four people sat down next to her (note bene, all unknown to one another). They fell into a conversation, in which it came out that these four had traveled together from Munich.

57. On the evening of October 16th, 1905, my brother Otto and our sister-in-law Lisbeth from Berlin, who was visiting in Vienna, went to the Burgtheater. Prior to this, Otto sought out a barber

shop. After him, a gentleman came in and sat down. The barber asked this man how he intended to spend the coming evening. The answer ran: "I am going to the Burgtheater."--Then the barber: "You hardly ever do that, do you?"--That's true, but my sister-in-law is in Vienna, and I have to escort her to the Burgtheater."

58. On April 18th, 1915, I had observed a belatedly spawning grass frog (*Rana temporaria*) in Rekawinkl (on the west train, southern Austria). Coming home in the middle of the day from this excursion, I came upon another specimen of *Rana temporaria* in the "Hackinger Au," a dry, dusty park where countless men--on top of it all, it was a Sunday--were wandering about, and where I would never have suspected that there would be a frog, let alone the grass frog, seldom found in the environment of Hacking at all. Here the grass frog seems to be replaced by the related spring frog (*Rana agilis*).

59. On May 15th, 1917, before 8:00 in the morning, as I was passing by, I accidentally saw in the display window of the shoe store "Paprika-Schlesinger," which was richly provided with mirrors, that my hair was already quite thin at the crown. At my office, the censorship office that has been frequently mentioned here, my friend Dr. L. Sp. noticed the same thing about me this very same day. However, at this time he only made a sarcastic comment about it to our colleague Dr. H. M. Then, about 10 o'clock I was called to the office of personnel. In order to get there, one had to cross the street and pass by the display window of a frame and photography store (A. Krautszak, Tuchlauben 8). I glanced at this window and later returned to my own office, from where my colleagues were able to follow my progress. Now Dr. L. Sp. no longer kept to himself. My baldness had shined out all too brightly when I turned to the shop window, so that he no longer wished to conceal his discovery from me. I had become subjectively conscious of its existence in front of a shop window two hours before, and it was again a display that had inspired Dr. L. Sp. to bring it anew into my consciousness objectively.

60. The advertising columns of a large daily newspaper are a constant source for serial occurrences in the classifieds. The accompanying reproduced excerpt from the advertising section of the "Voss Newspaper" contains two ads, in which a twin baby carriage--certainly an unusual item in itself--is wanted to buy. In addition to this, the horizontal proximity of these two ads is something purely "accidental," since in the vertical sequence of the ads they are separated by every item imaginable. (See attached reproduction of the ads.)

61. Sunday, February 4, 1906, my brother Otto went for an trip to Leopoldsberg (northwest of Vienna). As there was no other place in the refreshment room two foreign people sat down with him at the table.--Sunday, February 11, therefore a week later, Otto took a trip to Gumboldskirchen (south of Vienna), and these same two people sat down with him at the table, again, because there wasn't even another free chair.

62. On April 2, 1906, Herr L. v. P. trimmed his beard in the living room of his cousin, something he had never before done. His cousin sees this, laughs and told him that her son had trimmed his beard that same day in the same room, which he likewise had never done before.

63. Privy Councillor Dr J. K., an eager Nimrod, had shot no eight-pointed roebuck for 15 years. Quite understandable, because in a normal lifespan the male deer only produces three antlerpoints,

so that, counting both antlers together, they come to a 'six-pointer'. But then in two successive years he shot 'eight-pointers'--just such a rare buck on September 25, 1903, in Ungarn, and on August 5, 1904, in Galizien.

64. (Spatial series:) On November 29, 1905 colleague Dr. F. M. comes to me in my working room at the institute and asks me what kind of mammalian order is 'cete'. I answer: 'cete' means 'whale'. --Immediately Prof. Dr. H. Prz., whose workroom lies next to mine, so that one hears every word through the door, bursts into the room and calls out surprisedly: 'At the same moment as you spoke the word 'whale', my eye was passing over the word 'whalefish' in my reading--One must realize that the whalefish does not in any way form a favorite object of research at our institute that would occasion frequent discussions of it. As already mentioned in the previous chapter as series type 6, simultaneous reading and speaking of the same words is just as frequent as the simultaneous thinking and even unintentional simultaneous expression of the same word by two persons. The latter is usually taken as the expression of a thought transference, which, however, in all cases that are so constituted as the one adduced here, can be excluded: the thought of the inquiring colleague can not possibly transfer itself into the book, whose very next line exhibits in printed form the word inquired about. But the contrary way is also not possible, namely, thought transference from the reader to the inquiring colleague, as the entire paragraph recited did not deal with whales, which were only detailed as a single example for a general phenomenon and for an entirely different problem. The thoughts of the reading colleague could thus scarcely have been occupied with the thought 'whale' earlier than the moment his eye came to the word 'whale' while passing over the lines.

65. (Temporal series:) On October 17, 1905, Prof H. Prz. clearly hears the word 'armageddon' from people who were walking in front of him on the street. On the night following this he reads the same word 'armageddon', which he never before had heard, in a book (in fact in H. G. Wells, 'The Stolen Bacillus and other incidents.' Leipzig, Tauchnitz, 1896). --This series has also already been noted in relation to its specific content as typical (type 8): quickly repeated instantiation of expressions seldom or never heard before in spoken or read form respectively as members of the same series under the heading of speech or reading.

66. (Sameness series:) At the back of the cover of a music book (Cramer, etudes) an insert catches the attention of my friend Dr. Robert Konta on March 22, 1906; it was about Beethoven's little known Scottish songs. In the evening Robert's brother Paul comes to his house, finds in the mail the newest volume of 'Kunstwart', pages through it and says to his brother in preface that it would interest him as a musician: "You, Robert, in it musical supplement this time the Kunstwart has the 'Scottish songs'"--To this Robert "Are they those by Beethoven?"--Paul: "Yes!"--A similarity series would have been presented, if for example the Scottish songs of another composer had been reproduced in 'Kunstwart' or announced in the insert; or (less striking) other songs by the same composer, only not the Scottish ones. But in so far as the boundaries between sameness series and similarity series are fluid, when one keeps it in mind that the first member was an insert, the second a printed text of Scottish songs, he may report a graduated difference of the qualitatively identical members 'Beethoven, Scottish songs.'

67. (Similarity series:) At the postponed jubilee concert on January 15, 1906, in Sophiensall (Vienna), on the occasion of the 25th production of holiday camp evenings, a song was sung by

each of three performers, whose text dealt with 'Hansel and Gretel'. The opera singer Rita Michalek sang 'Hansel and Gretel' from des Knaben Wunderhorn, set to music by Gustav Mahler. Another singer brought something from Humperdinck's fairy tale opera 'Hansel and Gretel.' As the third occurrence, Schumann's 'Armer Peter' figured in the program, three songs, in one of which the subject is about 'Hansel and Gretel'.--A sameness series would have been presented here, if the three singers had taken up the same song of the same composer in their repertoire, which they had of course not agreed upon ahead of time. I want to grant that this series, which I have adduced on account of the specific analogy which makes it so nicely comparable with the preceding one, meets with the objection of a causal connection between the choice of song (children's theme of 'Hansel and Gretel') and the occasion (holiday camp), and thereby could be understood, if only by an extreme skeptic, as direct causality instead of seriality. Whoever stumbles over this point might want to cite example 68 in its place, which is just as pertinent, although less comparable with example 66.

68. (Homology series:) Mrs. V. v. W. is riding in the streetcar on the March 1, 1906. An old man sitting opposite her on the bench, who looked apoplectic, suddenly takes ill and collapses where he sits. The other travelers guess that he was in the grip of a fit.--A quarter hour later V. v. W. was going along the Herrengasse (Vienna). An old woman falls to the ground before her on the sidewalk, probably having suffered a heart attack. (Both series members are original experiences; in example 33, 34 of chapter I both are reproductions with respect to memory.)

69. (Analogy series:) Sunday, October 29, 1905, Mr. Blend (a guest from England) and the brothers Karl and Hans Prz. together visited the Roman division of the Vienna art historical museum. A group of small figures attracted their attention, representing boys walking on their hands. As they went on their way and came to the Kornergasse, they saw some street youths, one of whom began to walk on his hands in the middle of the street.

If the strollers had seen boys walking on their hands independently of one another in two different streets, or if they had visited two museums and in both, or, say, in the Roman as well as in the Egyptian division of the same museum, they had found similar sculptures, then we would have here the phenomenal form of a homology series.

70. (Homology and Identity series together:) January 28, 1906, invited to dinner at the Advocate Dr. J. R.'s, I observe that at two different points of the fairly long table two conversations fully independent of each other were being simultaneously conducted on the same theme (Italy).

71. On January 20 and 29, respectively, 1906, there died Frau E. M. and Frau E. v. P. Both had lived in the same house on Burgasse (Vienna) and were of the same age.

Thus, the repeating events here (in 70 in space, in 71 in time) are not merely identical as far as particulars, and hence not identical series. But in each case they also obtrude into my consciousness in like form (70 through personal experience, 71 through narration). Accordingly, they are homology series. The blending of the homology and affinity series in one and the same serial case is more in need of explanation. A general example is suitable for this explanation, which again is drawn from the phenomenal domain of the series type 2 (Chapter II), of which it was just now already said that it sometimes manifests the character of the analogy series, other times that of the

homology series. In the following case the latter is now applicable, that is, pure impressions of the same phenomenal form communicate themselves to us (here pure real experiences). At the same time however it bears the stamp of the affinity series through the differences existing between those experiences:

72. (Homology and Affinity series together:) I meet a person who reminds me of a friend through a certain similarity of features or bearing, and at about the next corner the friend himself comes. Between the initial and final member of this typical series, intermediate members can be interpolated, which often advance in increasing similarity up to a final agreement and personal reunion with the friend himself. Such an experience, which everyone can no doubt corroborate from his own recollection, is especially striking when it is a question of a friend whom one has not seen for a number of years. On the other hand, it takes on an even more heightened significance when one is impatiently expecting the friend at a place of rendezvous, or when he is delayed. For the most beautiful case of this kind, since it doubles serially, I am indebted to the friendly communication of Herr Professor Dr. H. PRZ: he saw two ladies sitting in a wagon, whom he mistakenly took to be acquaintances. Not far from there a wagon came up, in which were present the two originals of the previously seen likenesses to images in his memory, namely, the very two ladies of his acquaintance (but not usually, perhaps, going out for a drive with each other), and indeed exactly in that mutual posture--the one on the right, the other on the left--as the image in his memory had depicted them previously. The following chapter will discuss to what extent one could also interpret such phenomena on the basis of explanatory principles other than serial.

73. One seats himself on a bench at the edge of a not-too-densely populated, yet much frequented promenade and observes the coming and going of the passers-by. One will never see them dispersed uniformly, but they move along in batches, and then again a period of quiet prevails. The groups consist not only of people who go together because they belong together, talking with each other or otherwise traveling together, but they also consist of those who keep to a "group" only through so-called chance. We can confirm the correctness of this observation in direct experiment, if we set it up so that the actual appearance of a human series is perceived as a disturbance: say, if while sitting on the observation bench, one devotes himself to another strict, but easily distractable work, e.g. composing; or, as it often happened to me in the south, with a snare to trap the nimble lizards sitting on curbs, which are startled and completely scared away by people passing by, who turn up one after another as if "by magic," so that one in order to succeed in making a lucky catch, one must wait until the "person series" has yielded to a "rest series."

74. (Contrast series:) On August 27, 1907, I open a window in the streetcar. A grumbling old man immediately stands up and slams it shut. On August 30, 1907, my brother-in-law E. v. W. says on the streetcar that he must guard himself against draughts. Scarcely does a mean-looking woman hear this, than she gets up and opens two windows.

75. (Exchange series:) I am sitting in a garden pavilion whose plank floor is broken up at regular intervals by parallel gaps between the planks. I am feeding the birds--a crumb falls in a gap and becomes inaccessible to the birds. The next morsel falls on the plank and is taken away by a sparrow. Is there any seriality involved here? Until now it is not noticeable. I toss further crumbs--the next falls in the depths, the one after that remains lying on top, perhaps following this pattern several more times. Falling in the cracks often alternates several times in a regular sequence with

the falling onto the floor, in which the tossing is, of course, done at random. But even if one wanted to aim, it would still require a skilled tosser, a considerable "aiming force," in order to turn the "accidental force" in other directions.

76. (Direct, succedent analogy series of the first order:) The 'New Viennese Daily Paper' on Thursday, December 31, 1914, No. 361, carries the following notice on page 12: "A short time ago, Cadet Oscar Mueller, a former student of Prof. Dr. M. Guttmann from the Elizabethgymnasium in Vienna, went to take leave of his old teacher, since he had to betake himself to K. to the battle front; the Professor entrusted him with a letter to his son, who was likewise in the field, with the request to mail it in K., so that the forwarding would be speeded up. The cadet naturally promised to comply with his wish, and rode into K. with his troop a few days later. In one of the streets they went past a group of officers who were conversing about some subject or other, and while riding by the word 'Elizabethgymnasium' struck the ear of the cadet. This puzzled him; he rode back and asked, "Please, which of the officers spoke of the Elizabethgymnasium just now?" A young lieutenant immediately identified himself and after a short discussion Cadet Mueller handed him the writing with the words: "I have a letter from your father to give you!"--The newspaper sized up this situation in the manner that people are accustomed to judge such incidents without knowledge of a lawful serial power, "In wartime, accident often brings with it situations which at other times are at best labeled as quite well made up...One can imagine the astonishment that played across the faces of all those present at this accident. Cadet Mueller had travelled in a few days from the father directly to the son whom he did not know and who--his proximity unknown--spoke the word Elizabethgymnasium in the midst of millions of soldiers at that moment and in that place just as the bearer of a letter sent by his father rode by!" What the reporter thought so especially strange there is the very thing that appears to us almost self-evident and inevitable. Namely, that the experience took place precisely on a direct trip from father to son; I maintain, and it will soon be better understood why, that it would have eventuated with greater difficulty and less probability, if the trip had not been such a direct one and had led in a roundabout way and with greater loss of time to its destination. Also this, that such 'accidents' actualize themselves especially frequently and in flagrant form, is something true and, in our sense, something to be expected. War is an eventful time; the more events being enacted, the more easily they would have to array themselves in conspicuous series.

77. (Simultaneous identity series:) On April 17, 1906, the clock of the Raimund Theater in Vienna, the watch of my brother Otto, and my watch showed 8:14 when they were compared at the same time, or as the case may be, as quickly behind one another as a glance from one dial to the other. Later it came to light that all three clocks did not keep correct time, but rather were behind the correct Viennese time by exactly the same amount to the minute (by how much I neglected to note, it would have been some minutes).

These were two examples (Nos. 76 and 77), in which one can in no way imagine a commonly acting cause for the repetition. I now intentionally bring in a few further examples, which are not so free of objections in this respect.

78. On September 18, 1905, I noted for myself: On the same day, twins were born on the first and second floor of the Sanatorium Hera, Vienna. Now, the said sanatorium is, to be sure, not a

childbirth institution, but still it is sought out mainly for gynecological cases. Again, twin births are, to be sure, rare enough to allow that there may be a striking concurrence at the bottom of it, even considering the predominant frequency of women; but he to whom the serial way of considering things is strange will nevertheless fasten onto one cause as the common one covering the case of repetition in both its components, namely, the popularity of the Sanatorium Hera, in order to resolve birth and childbed therein.

79. On January 6, 1906, my mother receives a visit from two familiar ladies (Mrs A. R. and Miss R. S.), one right after the other, so quickly that the visits could have hardly come closer together. Completely independently each related that she would be required to move, because she could not get along with the caretaker. --If one sees the serial nature in the fact that on the same day both ladies made the same alarming disclosure to my mother, this would amount to finding a common cause in the fact that the traffic between them and my mother at that time was extremely brisk. However, if one sees the serial nature in the fact that both ladies could not put up with their caretaker, and because of this were compelled to move into a new dwelling, then two kinds of common cause will be found: firstly, the somewhat vicious nature on the side of the tenants, well-known to me; secondly, the somewhat vicious nature of the Viennese 'concierge' known to many, so that indeed, in Vienna, changes of residence for the reasons reported rank among the most frequent.

80. From July 10 until July 20, 1917, I worked at the Himmelhof by Ober St. Veit, Vienna, almost daily for some hours in the morning on the work in front of you. It disturbed me greatly that a young hotel guest picked out melodies on the piano there, dotting the keyboard with one finger. Among the melodies was one that had become endlessly popular, 'The Sailor's Lot' by H. W. Petri-Martell: having met with a torpedo from a submarine, a ship vanishes beneath the waves amid sounds of a waltz--At this point, a piano virtuoso of the same age and same method of playing also surfaced in the house at 236 Auhofstrasse, opposite my home. His favorite melody was 'God Saves'. And a few days later, a nearly grown young woman in the garden house, with the favorite melody 'Prince Eugene' played with one finger. A common cause for the fact that it was just in those rarely granted vacation days that there befell me two examples of boys and one of a girl who only knew how to handle the instrument of torture with one tenacious finger, is not conceivable without something further. For all that, such virtuosos are unfortunately not rare enough to immediately explain the threefoldness of their appearance as 'series'. For the most conspicuous feature of the three cases--patriotic melodies picked out in single notes with a lonesome finger--the World War is the common cause, during whose long duration patriotic things of every form have been drummed into the children by school and home, so that they, with the same enthusiasms as the present generation, can ruin the fatherland both humanly and economically in a future world war.

a) Authentic Periodicity

81. Victorine von Weidersperg had three sons (and the same number of daughters as well): Egbert, born 10-12-87, died 8-22-88; Egon, born 11-3-69, died 8-22-1909; the remaining son Edgar, born 10-22-68 fell into a swoon at his office 8-8-1915 and had to be brought home in an ambulance. The interval of the bout of illness from the date of death of the brother came to 14 days (naturally without reference to the year), which is half of the female period (although present in both sexes) of 28 days. This halving of the 28 day period is however quite customary.

82. Of the four daughters of Herr Dr. Robert Fischer, two, Erika and Gerta were born on an 18th of December; ordered according to age, the birthdays of the five children are presented as follows: Johanna 2-2-94, Marie 10-18-95, Walter 3-24-97, Gerta 12-18-99, Erika 12-18-1903.

83. Great landowner Johann Mayer (Tazowitz, Post Wollenitz, Bohmen) was born on 11-18-52; his son Hans Mayer on 11-18-84.

84. Hans Gerhard H. (Berlin), born on 1-7-81 about 7:00 in the evening, had for his great grandfather on his father's side Johann Rudolf H. (Vienna), died 1-7-59 about 7:00 in the evening.

85. The four daughters of governor Wilhelm Laufberger presented to his whole circle of relatives and friends a standing subject for conversation, because they had all been born in successive years on the 8-7.

86. My friend Carola Nahowska--an excellent observer--received in August as a chick a redbacked shrike (*Lanius collurio*), which she cosseted back to health, so that it grew into a strong, fully plumed bird. Since then--it was ascertained for the eighth time in 1917--every August "Pieps" once again adopts the habits of a newly fledged bird. Long accustomed to feeding by himself, for a time every August he wants to be fed. Devoting himself to his nurse and following her about, he opens his beak wide, beats and flutters his wings, and emits a hoarse, impatiently demanding peeping. During the remaining part of the year, he will occasionally take his food from the hand, but quietly and behaving reasonably. For the most part, he only takes dainty morsels, and without the concomitant importuning that one come to him and stick the food in his beak. Even the sounds that he makes throughout are entirely those of a grown shrike.

87. On April 27, 1915, my wife (earlier an actress) told me that for about three weeks she had dreamt about theaterschool, theaterplays, and related matters unusually often. 10 years and 15 days earlier--on 4-12-1905--she had stepped on stage for the first time.

88. On April 15, 1915, Erik Schmedes sang Tristan in the Vienna High Opera. The production, which his wife attended as always, ended at midnight.--48 years later ("about 12:00 midnight") Mrs. Schmedes began to sing Isolde's Liebestod out loud in her sleep, so that her husband, quite frightened, had to waken her.

89. On 8-9 Otilie Schreker was born, 9 months after the birthday of her mother; on 12-23 Immanuel Schreker was born, 9 months after the birthday of his father.

b) Inauthentic Periodicity

90a. Franz Schreker, born on 3-23, presented his 'Chambersymphony' on 3-23 1917.

90b. On 11-10-1916 for the birthday party of his wife, he presented his 'Prelude to a Drama'. (Mrs. Maria Schreker possesses--compare example 89--two baptismal certificates: the one reads 11-9, the other 11-10; it is not known which document is correct.

91. Dr Hans Mayer observed to himself that external events that were decisive in his life kept to an interval of 7 months and 20 days. Thus on 4-15-1915 he had to enroll, on 12-5-1915 he came to the hospital in Zenica (Bosnien), on 7-25-1916 he was transferred to Vienna. Also, turning points that concerned not only him, but the whole world, ordered themselves in the same or nearly the same interval according to decisions that applied to him personally. On 7-26-1914 the World War broke out, on 3-15-1915 Dr. H. M. was certified; on 3-15-1917 the Russian revolution broke out, Dr H. M.'s aforementioned transfer to Vienna (7-25-1916) had already taken place 7 months and 20 days earlier.

92. On 5-10 or 5-11 1915 I made an excursion with the family W. to the Kahlenberg near Vienna. On 5-8-1916 the excursion was repeated not merely with the same destination, but also the remaining concomitant circumstances were nearly the same. Among other matters, each time a visit to the Konstantinhugel in Prater had preceded the excursion, in 1915 as well as in 1916. The similarity of the situation struck all the members there. Nevertheless, they were entirely impartial, and they sought for differences. R. W. said: "The house seamstress was with us for several years; she was missing this year!" No sooner was this said than she unexpectedly walked in.

93. On April 12, 1916, my wife road to the Semmering early in the morning, Frau Dr Margarete Falk to Lemberg in the evening. On July 30, 1917, my wife road the early train to Bohmen, Dr Margarete Falk rode on the same evening train as the previous year.

94. On January 22, 1906, Prof Dr H. Prz. ordered his material on Egyptian [Fangschrecken] (*Sphodromantis bioculata*). While he was busy with this, the mail brought him a sample from Egypt--sender Mr. Guyot in Helouan--, containing an ikon of *Sphodromantis*. Herr Guyot was asked for this about a year earlier, and we had already given up the hope that he would heed the request. It had also been that long since Prof Dr H. Prz. had last concerned himself with the subject.

An indication that periods become endemic and independent of external causes--

95. Thus, I observed in the unusually long winter and cold spring of 1917 a pronounced delay in the spawning season and corresponding migration to the spawning ponds for the earth toad (*Bufo vulgaris*), the spring frog (*Rana agilis*) and the alpine salamander (*Molge alpestris*). In the Vienna environs, all three species spawn in the middle of March and are finished with their spawning activity by the beginning of April at the latest. But in 1917 it was not until April 30 that I first found (pond above the Knodelhutte in Huetteldorg) the spawning clumps of *Rana agilis*. The spawning animals had indeed already departed for the most part, and in the gelatinous covering already permeated with algae one saw to a great extent embryos lying ready to hatch. Much more striking was the delay in the two other species: Likewise on April 30, I first found a weak female of the alpine salamander (pond below the Knodelhutte), overripe for spawning, with puffy, bloated body, and on the same day I saw in the same place a spawning activity of the earth toad such as I had never seen before.

The animals gathered in water were still predominately males (the females appear later at the spawning pond). They behaved as if mad, clung to one another and to the few females present in such clusters--five to six males formed huge shapeless clumps aaround every single female!--that

the females were killed. Most were already thoroughly rotting, but during the examination new males swam to them once again and after some fruitless searching hooked themselves fast. The following occurrence was entirely unusual: one harried female left the water to escape her tormentors, and scrambled up the steep slope. A whole swarm of rutting males went up after her, so that the clay rubble rolled down loudly into the water. Spawned together in certain places--perhaps on account of the tree branches lying fallen in the water, which facilitate the wrapping around of the string--there lay a monstrous tangle of egg-strings, over 1/2 m in diameter and enclosing thousands of meters of string lengths. From a distance one could not at all recognize what kind of body it was that lay there in the water: too large for a spawning clump, it looked almost uncannily like the water-logged coat of someone who had drowned. Then in July the pond was black with tadpoles, in numbers such as I, who still look for it yearly, had never seen before.

96. I would like to produce an example of my own for the recurrence of a determinate, annual lucky day, which was certainly the case for my little daughter Lacerta. On April 20, 1914, I went for an outing at Rekawinkl in Vienna with my wife and child, the latter then six-and-a-half years old. Lacerta had never before made an excursion with her father. Ponds were the real goal, where amphibians were to be spied on as they laid their eggs, and some salamanders and watersnails were to be found for the aquarium. It came up to our expectations, and the happiness was great. In the spring of 1915 wife and daughter beseeched me for a repetition of the outing; it did not exactly have to be Rekawinkl. I also had a desire to go, but had trouble getting away. Finally I gave in, and it came to pass that we again rode to Rekawinkl, in spite of the fact that I would have preferred to show my little girl something new. So it took place on April 18, 1915. Nature was lagging far behind as compared with the year before. At that time the wood-sorrel had been in bloom, this time not yet; and as for the meta-biotic primroses *Primula elatior* (March, April) and *Pr. officinalis* (April, May), at that time the dark-yellow umbels of the the latter had already covered all the meadows, this time almost only the pale yellow of the first. The spawning-season of the grass frog (*Rana temporaria*), and in large part also that of the earth toad (*Bufo vulgaris*), were already over in 1914, that of the spring frog (*Rana agilis*) underway; in 1915 there were no spring frogs to be seen, the grass frogs were in full spawn, the earth toads just beginning. I report these details in order to show that no kind of meteorological influences could have brought about the recurrence of the impulse (lasting up to two days) to have an outing and its goal, but in all probability the yearly period determined internally by the subconscious memory. Since this, even in spite of other intentions, knew how to smuggle in again the same destination of our outing, as well as the repetition of certain external accompanying events--each time we left the woods and the view of the Lastian residential colonies, roes appeared at almost the same place, the only difference being that in 1915 they appeared a few meters higher than in 1914, and there were four head in place of the two of the year before--, the serial character of periods is very clearly recognizable in the example being described, the annual period being a special case of a series with a lengthy time span.

97. Mrs. Marie Gutheil-Schoder had sung unprinted songs by Alma Mahler in a concert on November 11, 1913. Afterwards, singer and composer spoke with each other. To the thanks for the truly excellent rendition was appended a heart-felt invitation on the part of the composer to visit her right away to keep in touch on the telephone. First of all, no one appeared for a long time. Then, on May 17, 1915, Mrs. Mahler received the first printed copy of the songs sung from manuscript at the concert, sent on by the publisher, and wrapped it up immediately again in order to send it gratefully

to her former interpreter. The following day--the package was lying in Mrs. Mahler's home, ready, but still not posted--Mrs. Gutheil calls and says that she would like finally to go make good on their earlier arrangement and to call on Mrs. Mahler. It is hard to find a recognized interval between the date of the arrangement and its accomplishment, and such a period could only be supplied by contrivance. Apart from this, the long duration of the interval already makes it unlikely that there was one period eliciting the recollection in both ladies simultaneously. In the life of busy men, recollections of such relatively trivial happenings as a social engagement either surface quickly or not at all. At the very least, in the previous case they would have had to be frequently intimated during the interval, and then it would remain inexplicable, according to the laws of periodicity, why the final compliance on the one side coincided with the tying up of the package of printed matter on the other. Accordingly, one will sooner make the completion of the printed songbook and its dispatching by the publisher, of which however Mrs. Gutheil could have had no knowledge, responsible for the determination of the last sequence of happenings (the intended forwarding of the book to Mrs. Gutheil and her placing of the unexpected telephone call). Then pure, period-free seriality offers itself as the only explanatory possibility for grasping the connection of the whole complex in a natural way, meaning without "chance" and without "higher providence."

98. Daily, I take the Viennese streetcar from my residence located in the suburb of Hacking to my institute located in the Prater. The first stations after Hacking are called: Ober-St.-Veit, Unter-St.-Veit, Braunschweigasse, Heitzing, Schoenbrunn etc. The daily trip at about the same hour in about the same tram has as its consequence that one encounters about the same people--some more frequently, others more seldom. Without their exactly being acquaintances, one knows them from having seen them for a long time on the streetcar. When I am not reading, I make observations of my fellow passengers, who link up in serial groupings. Certain passengers who very seldom ride--with one of whom, Herr K., I am personally acquainted and know that he possesses an automobile, which he understandably prefers to the streetcar when his wife does not need it--, these passengers are announced by "Prevenants", by precursors who act as doubles, who resemble them, or, without our being able to fix distinct marks of similarity, nevertheless very strongly recall the others concerned. Having posited all this--at Unter-St.-Veit I caught sight of a man at the tram stop who is similar to Herr K. who is known to me, so I can expect with a certain probability that Herr K. himself will board at Hietzing. The "precursor" of Herr K. must not always be the same and can also show up at any other station before Hietzing. The circumstances can also be inverted, which then would be less conclusive for a first establishment of serial occurrence: at the departure in the direction of Prater-Hacking Herr K. first alights in the station Hietzing, and we catch sight of a double in a later station.

99. The first time, I couldn't get my verification of the regeneration of the limbs of a Northern Italian brown cave salamander (*Spelerpes fuscus*) to work for me: it couldn't lie in my inability, for I am very experienced in the cultivation of this sensitive animal, and furthermore very practiced in unusually ticklish operations. But it didn't work; several imported specimens from Florence had already perished before their amputated limbs had grown back. Then I handed over experiment to a colleague, Dr. F. M., notwithstanding the fact that he was a tyro compared to me; and now it turned out well at one go, to all appearances without him having done anything differently from what I had also done previously.

100. In the spring and summer of 1915 we had a habit of going for walks on Sundays with a neighboring family (H. -W.), in fact toward evening, after the early afternoon hours were spent inside or in the garden. The destination was always a merry-go-round and high swings near the "Himmelhof" in Ober-St.-Viet (Vienna). Suddenly the walks ceased: not because anyone was weary of them, and just as little because anyone forgot them--on the contrary, it always was something like this: what a shame, today we cannot go on our usual walk again. Actually, there wasn't even any definite, lasting impediment. But each time there was another cause that kept it from occurring: the first time rainy weather; the second time the foot pains of a lady (Frau A. H.) participating in it; the third time the short walk was replaced by a longer ramble with a destination lying further out; the fourth time someone preferred to shoot targets with bow and arrow in the cool evening garden. From then on I did not notice the special causes any longer. Moreover, there was nothing further which I would have been able to notice, for the walks to the people's amusement park at the Himmelhof had entirely lapsed and had now sunk into forgetfulness or were out of favor. From then on this might be referred to as the active cause of the further discontinuance of the Sunday walks--for someone standing at a distance observing the process and the change, the one-time total absence of a common causal basis would now have been filled, and even simulated, by serially occurring special causes. Finally, however, the seriality changed over into ordinary causality.