Bauwelt Fundamente 165

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R. BUCKMINSTER FULLER
INVENTOR OF:

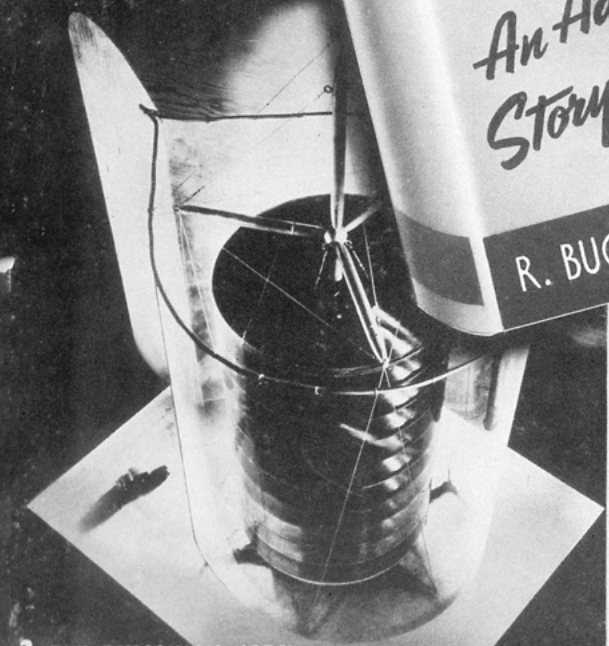
1. THE DYMAXION CAR

2. THE DYMAXION BATHROOM

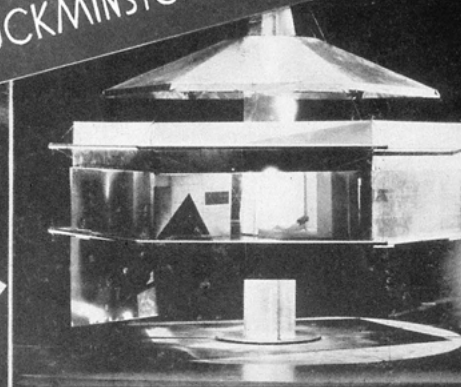
NINE CHAINS TO THE MOON

An Adventure Story of Thought

R. BUCKMINSTER FULLER



3. THE DYMAXION HOTEL



4. THE DYMAXION HOUSE

R. Buckminster Fuller

Nine Chains to the Moon

With a foreword by Lord Norman Foster and two postfaces by Joachim Krausse and Claude Lichtenstein

Bauverlag
Gütersloh · Berlin

Birkhäuser
Basel

The Bauwelt Fundamente series was founded in 1963 by Ulrich Conrads; it was edited from the early 1980s to 2015 jointly with Peter Neitzke.
Supervising editor of this volume: Elisabeth Blum

Layout since 2017: Matthias Görlich

Front cover: "Streamlined Dymaxion Shelter" ("Dymaxion Hotel"), model, 1932 (detail)
Photograph: F. S. Lincoln
Back cover: R. Buckminster Fuller with study models of his "energetic-synergetic geometry" 1946
Frontispiece: Poster produced by the publisher Lippincott Company (New York – Philadelphia – London – Toronto) for the first edition of "Nine Chains to the Moon", 1938

The responsible editor and the contributors of this volume are deeply grateful to Kurt Eckert for his good eye, friendship and support.

Library of Congress Control Number: 2019944377

Bibliographic information published by the German National Library
The German National Library lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.dnb.de.

This publication is also available as an e-book (ISBN PDF 978-3-0356-1776-4; ISBN EPUB 978-3-0356-1778-8)

P.O. Box 44, 4009 Basel, Switzerland
Part of Walter de Gruyter GmbH, Berlin/Boston and Bauverlag BV GmbH, Gütersloh, Berlin

bau verlag

Nine Chains to the Moon

The Works of R. Buckminster Fuller

Santa Barbara, California
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The R. Buckminster Fuller Archive resides at the Department of Special Collection, Stanford University

Printed in Germany
ISBN 978-3-0356-1775-7

9 8 7 6 5 4 3 2 1
www.birkhauser.com

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Foreword to this New Edition of *Nine Chains to the Moon*

Lord Norman Foster

I first met Buckminster Fuller – or *Bucky* as he was fondly known – in 1971. He had been asked to design a theater beneath the quadrangle of Saint Peter's College, Oxford, and was looking for an architect to collaborate with him on the project. We quickly came together as kindred spirits and subsequently went on to collaborate on a range of projects over the last twelve years of his life. He was one of those rare individuals whose way of thinking fundamentally influences the way that one views the world. He also drew attention to the fragility of our ecosystems by coining the phrase "Spaceship Earth" ahead of regular space travel.

Nine Chains to the Moon was Bucky's first book – an eclectic collection of essays, all of which illustrate Bucky's optimism and belief in a benign technology that would enable mankind to survive and prosper if it used its collective intelligence. He influenced an entire generation of creative people because he was so far ahead of his time in many ways – and often ahead of the technology of the day. He coined the term *ephemeralization,* referring to the ability of technological advancement to achieve an accelerating increase in efficiency with the same or lesser input – in other words, *to do more with less.* The essays in this book illustrate Bucky's initial thoughts and ideas about his vision of future prosperity driven by technological progress. He had a great impatience and an irritation with the ordinary way of doing things. He took nothing for granted, asking the right questions, challenging common assumptions – always starting with a clean sheet of paper and an open mind.

He was the essence of a moral conscience, forever warning about the fragility of the planet and man's responsibility to protect it. Never has Bucky's exhortation to *do more with less* been more relevant. The themes of shelter, energy and the environment best reflect Bucky's inheritance. The principles of sustainable design, which Bucky pioneered, are central to architecture today especially in the face of the challenges of energy, pollution and climate change.

In the media, Bucky was often portrayed as the cool, detached technocrat. Nothing could be further from the truth. In reality, Bucky as a person and a friend was courteous, kind, generous and thoughtful. Given his utopian vision, he could, where presented with practical issues, be remarkably down-to-earth. As a poet, philosopher and cartographer he also defied all the usual classifications.

Lord Foster is Founder and Executive Chairman of Foster + Partners

To Alexandra and Allegra

"Your Strange Divinity Still Kept"

(From "To a Child" by Christopher Morley, 1922)

An Outline

(*For Pre-viewing and Re-viewing, – Book Begins at Page 13*)

Upon the premise that the sum-total of human desire to survive is dominant over the sum-total of the impulse to destroy, this book is designed. It does not seek to provide a formula to attainment. To do so would develop dogma and nullify the process of individual rationalization that is utterly essential for growth.

"Rationalization" is an act similar to walking through a half-frozen, marshy, unexplored country to mark out a trail that others may eventually follow. It involves not only the familiar one-two progression of shifting the weight and balance from one foot to the other, but an unknown quantity progression of selective testing to avoid treacherous ground before putting full weight upon the forward foot.

"Rationalization" is a time-word to replace "thinking," which is an ancient, mystically evolved word tentatively signifying an attempt to *force* the power of God into one's self. "Rationalization" connotes a constant, selective balancing of relative values, gained from experience, for the purpose of harmonious, inclusive *re*composition and subsequent extension.

It is central to my philosophy that everything in the universe is constantly in motion, atomically if not visibly, and that opposing forces throughout this kinetic picture are always in neat balance; furthermore, that everything invariably moves in the direction of least resistance.

The history of man's CREATIVE effort is the story of his struggle to control "direction" by the ELIMINATION of known RESISTANCES.

To the degree that the direction of least resistance is controlled by vacuumizing the advance and de-vacuumizing the wake, the course of society can be progressively better charted and eventually determinable with a high degree of certainty.

This creative control, or streamlining of society, by the scientific-minded (the right-makes-mightist) is in direct contrast to attempts by scheming

matter-over-mindists (the might-makes-rightist) to control society by *increasing,* instead of lessening, *resistance* to natural flows through such devices as laws, tariffs, prohibitions, armaments, and the cultivation of popular fear.
By controlling direction, it becomes possible, scientifically, to increase the probability that specific events will "happen."
Preparation of the material herein set forth dates from the very beginning of my experience. Up to a point in that experience, I lived by the common code of loyalty and good fellowship with all of its convincing and romantic "tradition." Then, through my own particular quota of *important* slaps in the face, it became apparent that in "tradition" lies fallacy, and that to be guided in conduct and thought by blind adherence to tenets of tradition is, as said in slang, bravely to "stick the neck out." I realized that experience is the vital factor, and that, since one can think and feel consciously only in terms of experience, one can be hurt only in terms of experience. When one is hurt, then somewhere in the linkage of his experience can be discovered the parting of the strands that led to the hurt. Therefore, it follows that strict adherence to rationalization, within the limits of self-experience, will provide corrections to performance obviating not only for one's self, but for others, the pitfalls that occasion self-hurt. By cultivating the ability to rationalize in the absolute, one acquires the power of so ordering experience that truths are clarified and susceptibility to self-hurt is diminished to the point of negligibility. Through rationalization anyone may evolve solutions for any situation that may arise, and by the attainment of this ability through experience one obtains his license to be of service to mankind.
Rationalization alone, however, is not sufficient. It is not an end in itself. It must be carried through to an objective state and materialize into a completely depersonalized instrument – a "pencil." (Who knows who made the first pencil? Certainly not Eberhard Faber or "Venus.") The "pencil" not only facilitates communication between men, by making thought specific and objective, but also enables men, coöperatively, to plan and realize the building of a house, oxygen tent, flatiron, or an x-ray cabinet, by virtue of the pencil's availability. The inventor, alive or dead, is extraneous and unimportant; it is the "pencil" that carries over. Abstract thought dies with the thinker, but

the mechanism was building for a long time before the moment of recognized in-vention.

The substance of this book develops my conviction of these truths. In a final chapter, I have recorded certain thought-processes and results of abstract, intuitive thinking which would be obscure without reading the preceding sections. The reason for exposing myself to possible suspicion of "mysticism" is to show how important it is to transcribe the faint thought messages coming into our personal cosmos at the time of occurrence – sketchy and puzzling though they may be – because time, if well served, will turn them into monkey-wrenches and gas-torches.

The title, *Nine Chains to the Moon,* was chosen to encourage and stimulate the broadest attitude toward thought. Simultaneously, it emphasizes the littleness of our universe from the mind viewpoint. A statistical cartoon would show that if, in imagination, all of the people of the world were to stand upon one another's shoulders, they would make nine complete chains between the earth and the moon. If it is not so far to the moon, then it is not so far to the limits, – whatever, whenever or wherever they may be.

Limits are what we have feared. So much has been done to make us conscious of our infinite physical smallness, that the time has come to dare to include the complete universe in our rationalizing. It is no longer practical to gaze at the surfaces of "named" phenomena, within the range of vision in the smoking car of the 5.15, with no deeper analysis of their portent than is derivable from a superficial exchange of complexed opinion-notions with fellow commuters.

"After all," Jeans said, "it is man who asked the question." The question is survival, and the answer, which is unit, lies in the progressive sum-totaling of man's evolving knowledge. Individual survival is identifiable with the whole as – extension or extinction. There is no good old country doctor on Mars to revive those, who, through mental inertia, are streamlining into extinction.

1. Meet Mr. Murphy

Let us imagine an early fall evening in New York City. Rain and a high wind terminating the heat of an exceptionally warm Indian-summer day have brought on prematurely the blackness of night.

Into the gloomy downpour thousands of doors, architecturally designed for giants, have jettisoned half a million workers homeward bound. Subway entrances are jammed by inflowing masses in quest of swift transportation from local darkness to lighter suburbs. The stairways to the sheltered heights of the "elevated," linking, with steel rails, the Battery, Bronx, Astoria and Flushing with midtown Manhattan, are vibrant under the stomp of a multitude of mounting feet.

The pressure of traffic in the streets is terrific. Vast streams of upbound mechanical vehicles, interrupted by intersecting multiple crosstown flows, forge ahead, inch by inch – lines of cars, so closely compacted as to be in effect solid trains, miles in length, broken only by traffic lights and policemen's whistles, hundreds of thousands of dollars worth in every block.

The din of horns, the roar of the elevated trains, the spattering wind and rain, together with the brilliance of a myriad of automobile lights, neon signs and shop window glares (doubled in intensity by a galaxy of reflections on wet pavements and glistening automobile bodies) constitute a picture exquisitely confusing to the ear and eye. Heightened by the imaginative glamour of a swift, duskless nightfall, the scene would terrorize a simple savage and would have been utterly incomprehensible to ancestors who, only a few generations ago, laid the city's foundation unaware of portending electricity, steam and steel. What a projection of "hell," this bedlam, this stirring inferno, for ancient man, yet so unquestionably accepted and so little understood by current city dwellers!

Nowhere visible a vestige of any other living organism than "man"; no trees, no horses, or other form of ancestrally familiar life, with the possible exception of a wet, scurrying cat. Not even a patch of raw mother earth. A completely

by-man-fashioned environment, from the hard pavements serving dually as surface traffic lanes and as roofs for a honeycombed maze of arterial passages interweaving the depths below, to the roofs of brick, stone, steel and glass buildings. New York City! A one-piece dormitory, work, and play shop three hundred square miles in the horizontal plane and thirty to one thousand feet in thickness.

Suddenly the red brilliantines flash STOP. The traffic snake is cut. The foremost cars of a bridge-bound stream, their drivers' vision blurred by the wet confusion, stop abruptly within inches of a north and south bound traffic stream, surging forward again on the change to the green GO signal.

Mr. Murphy, worker, pushed his way through the traffic, paused an instant to buy a newspaper, and threaded his way sidewise between bumpers of halted cars to the opposite side of the street. Ducking into a plain man's open bar he called for a glass of beer, and one more, and then continued his few blocks' trek to an east-side subway.

Primed by the beer, Murphy elbowed his way good-naturedly through the crowd. At each corner he was caught in a mash of people, whose umbrellas held too high dripped onto his new $1.00 fall hat, or clutched too low caught at the sleeves of his suit. But he did not mind. Then, just before descending into a dank subway, he was jostled unpleasantly by several persons. He jerked backward quickly to escape being soiled by two cars, splashing crazily through a pool of water.

"You damned bastards!" Murphy exploded, using his neighbors as the arbitrary representatives of all automobile drivers. "Do you think you OWN the street?"

Poor Murphy!

He could not be blamed for relieving his feelings. The other pedestrians sympathized with him and the drivers of the cars, windows closed, did not hear him. If they had, they would merely have countered with blasphemy more eloquent than his own.

The transition in Murphy's mood from the pleasurable glow of his homebound beer to a general condemnation of the world and all its mechanistic

manifestations was not occasioned by the weather for, physically, the rain was a relief and Murphy was glad of it. His dangerous nerve snapping was the result of a multitude of over-riding factors not immediately obvious, amongst which may be listed the geographical disposition of shelters and economical factors, universe-wide in scope, controlling that disposition.

The solution of Murphy's inconvenience does not lie in meaningless words. It must be found in a control of circumstances far removed from questions of automobile driving ability. Traffic is not a willful demonstration of street usurpation. It is a composite of functioning transport media designed primarily for the transport of individuals from shelter to shelter.

Murphy dimly suspected that sufficient scientific thought exploration had not been done in the matter of shelter design and its attendant arterial hookups. He could not refrain from contrasting the utter inefficiency of the cockroach-breeding house, wherein his wife spent hours plodding, dustpan in hand, between cellar and attic, thirty feet vertically apart, and to reach which home took from his brief life-span two hours daily, and the magical efficiency of the radio by which, with merely a twist of a knob, he could instantly jump in actuality of the senses from wherever he might be in the flesh to a ringside seat in Chicago or to a ducal vantage in a Westminster coronation three thousand miles away.

If living were properly planned, Murphy vaguely and perplexedly conjectured, during the first few minutes of his subway ride, the status of man might be raised to a point where, instead of continuing longer as an impersonal, ineffectual, shuttling population-unit, he might become, at least, majority master of himself.

Reflection gave way to activity. Murphy had to fight to maintain a few inches on which to stand. On this particular night, due to the crowd and the warm steam of vaporizing human bodies packed into their transportation shelter like blood corpuscles in a noisily vibrating test tube, the struggle was particularly attention-consuming and very depressing.

When Murphy changed trains at City Hall station for the second half of his long journey home, he felt that he was no longer an individual. He was just anyone. Perhaps, even, no one.

Edging his way to a less congested portion of the car, he propped himself against a post, took his damp newspaper from his pocket, and tried to read. With two hundred blocks to ride, he speculated that he might arrive at the obituary section before it was time to alight.

2. Stomach Rhythms Not All Rhumbas

Contrast the confusing, soul-disturbing morning and evening treks of Murphy in a humpty-dumpty world, wasting precious lifetime because of the patent inadequacy of the architectural mentors of that world, with the following coolly deliberated incident in the scientific world.

On the basis of experimental proof that noise is one of the two stimuli which will bring out an overt fear reaction in babies, a number of students in a prominent American university coöperated with Dr. Donald A. Laird in the following experiment:

To determine the fear-reaction effect of noise stimuli upon gastric motility, a thick rubber balloon attached to a tube was swallowed by the students, after which it was inflated to a uniform pressure of 10 cm. of water. Contractions of the balloon in the stomach forced the contained air into a second balloon in a sealed flask, from which a tube led to a water column on which a piston attached to a counterpoised writing point was floated. Contractions of the stomach increased the air pressure in the balloon in the flask, altered it, and caused the water column to rise, thus lifting the writing point so that it might record the movement on a revolving marked drum.

Having swallowed the balloons, the students reclined quietly for twenty minutes and then were subjected to various degrees of sound.

It is well known that there exists a unique directional rhythm of the digestive tract, that is, unique as differentiated from the rhythm of respiration or of heart pulsation. In the course of this experiment, all of the students showed an immediate frequency change in gastric peristalsis when subjected to sounds even of low intensity. When the sounds were intense, for instance the sound of a pneumatic drill, the contractions were not only altered in character but were 50% slower than before the sounds were made.

People with headaches, digestive cramps, gastric overloading, *et cetera,* quite evidently cannot be either as receptive or effective in their internal or external

world relationships as persons not so disturbed. Certain degrees and types of sound have, then, due to their retarding influence on the digestive process, a wide effect on the social relationships of man. Sound, therefore, is a primary social factor. Man progresses in spite of such frictional conditions, not because of them. Flowing in the direction of least resistance, the progression in the myriad of cases of oversounding must be "down hill."

Noise is only one of many important human behavior conditioning mechanical factors known to exist, with the knowledge of that existence recorded and measured, which are as yet popularly unconsidered (beyond the area of the unscientifically phrased "very annoying"). These many known factors are but fractionally included in the obviously most important field of application, – controlled environment or shelter design romantically known as "architecture."

Murphy's physician had cautioned him against paving the way for a peptic ulcer by bolting his meals in restaurants that were noisy, overlighted, and fearfully upsetting. So Murphy, by buying a home in a suburb, substituted the noise of the subway for that of the restaurant. No rest for the weary!

Mrs. Murphy did not understand why Murph' suffered so much from noise. Julia was one of the lucky few who do not experience inconvenience from it. In fact, she rather liked the roaring rush into town by subway. She had found the rural silence very oppressive when she was first transplanted to Jamaica Gardens from noisy Herald Square. Murph's doctor told him, confidentially, that Julia was a ptupophilic, meaning fond of noise, and cautioned him that if she did not turn off the radio for at least a few minutes every day she would become ptupomanic. "Toofy," Murph' called her, especially when he had to shout to be heard above "WOR."

When he tried to tell Julia penitently that he had lost his temper coming home, he found it impossible to compete with station announcers. Instead of turning off the radio Julia tried to shut up Murph'. But "the old man" had something on his mind.

"Even if those auto drivers had heard me," he persisted, "it would not have done any good." It is unlikely that either was a bastard, and whether 'God' could damn them is only mystically debatable, – was the gist of Murph's thought.

Julia merely smiled and suggested, “Timmy, why not eat your supper?”
“Damn supper!”
“I thought you were wishing you could control your temper?”
“How can I, with that thing incessantly grinding out meaningless words and croonings?” Murph’ rose abruptly and went upstairs to the bathroom, where he dissolved some baking soda in water and drank it preparatory to retiring. He recalled disconsolately Edison’s prediction that noise will grow ever greater and that the city man of future generations may be deaf.

The vast majority of the causes of abnormal human behavior, which modern psychologists and psychoanalysts, like yesterday’s astrologists and alchemists attribute to “intangibles” in a *patois* used with mesmerizing and profitable skill, can be traced quite unromantically to mechanical maladjustments in the environment of the individual: bad plumbing of house or self-mechanism, bad sound or light control, unsatisfactory mechanics of sex equation. “Personality” talk to excuse uncontrolled behavior is vain, self-important nonsense. Unhappily the failure to recognize real causes and to utilize known remedies is preventing man’s understanding of his fellow being and of the myriad of phenomena to which all men are continually exposed. Few, if any, crimes of misunderstanding, single or multiple, would exist if a small degree of latent understanding were allowed by environment to come “alive” and penetrate man’s consciousness.
There are scientifically discernible potentials at hand for the solution of such crises as Mabel’s fight with her boy friend, Mussolini and Hitler vs. Great Britain, or Julia’s staying up while Murph’ falls asleep.
If factors already ascertained were to be applied to living, it would become possible not only to prevent misunderstandings that separate members of the spoilt older generation, but to avoid – and this is far more important – breaking up the unity of the potentially unspoilt new generation of millions of children by preventing their being over-noised and under-nourished or starved in full view of bounteous surpluses which, instead of satisying every need, have been and are being burned or plowed under. For what? “Recovery!” “Recovery” of inefficient ways of living and special privileges for individuals and groups.

There is a wider chasm between the understanding of the scientist and that which uncomprehending, groping Murphy would confess to be his understanding than there is distance between the earth and the farthest known star. Murphy's conscious "world" is perforce limited to his utterly unscientific shelter environment. He is forced to exist in shelters which mechanically prevent his adjustment to understanding, and it is fallacious to blame Murphy directly for his inability to see, hear, and understand.

Politicians and the privileged have realized that to keep Murphy environment-ignorant would be to control him. So long as Murphy could be so controlled, even though he might be "educated," their apple-cart concessions would not be overturned by science.

But science has no regard for "concessions," and ideas are pervasive. Murphy is on the verge of awakening to the fact that there is an "out," namely, the service of scientifically designed and industrially mass-produced shelters within the means of all. Such a service, however, cannot be had merely for the political asking. Neither political convention nor legislation ever brought a potato into being.

3. 'S a House, Darling

We hear much of designing from the "inside out" among those who constitute what remains of the architectural profession – that sometimes jolly, sometimes sanctimonious, occasionally chichi, and often pathetic organization of shelter tailors.

The pioneers who originally evolved the architectural "inside out" concept, now dogma to the profession, were led to it naturally through their own thought processes and deeds. They spared themselves no labor to go to the inside, and, once inside, were quick to realize the supreme efficacy of projecting from a central viewpoint.

After successful demonstrations by them of the inside out principle, their original trail blazing became the general formularized property of all whom the architectural guild included. Although ultimately the pioneers were acclaimed, according to the worth of their gift to various beneficiaries in terms of vanity or dollars, acknowledgment of the original quality of their creation was withheld until after the physical death of the designers. The lesser fry had need to prevent the foresighted few from cutting in on their "traditional" racket. So recognition was refused these deeply penetrating, hence visionary designers, while living, lest the schemes proposed by them be too popularly demanded before the untrained and unfitted "architects" had had time to re-educate themselves for the exploitation of the newer principles of design.

Obviously, to design a shelter from the inside out infers an outside with a key passage inward. However, if the architect does not think spontaneously in the terms of this primary philosophy, then to espouse it is merely to mumble a few words with the lack of objective understanding that characterizes most chanting of academic *bon mots*. Worse! To act without this basic knowledge is to be a non-progressive, dogmatic dolt, a shuffler and dealer of the same old pack of 52 cards for *chance* winnings.

The thought process discovered by the pioneers, whose design eventually proved to be successful, was understood by them only upon *subsequent* reflection.

When recognized, it proved to have been "from the inside out" thought. It was not professed in advance. Truly creative work cannot be professed. Only the academic may be touted. As applied to houses the pioneers' creative thought processes might have begun somewhat as follows:

"HOUSE – a phenomenon to which I am, upon first consideration, an outsider. What is a house? A block of brick, stone, wood, or steel, or a composite thereof? An object with various patterns of square openings called WIND-O-S applied to its surface? The alphabet-book illustration under "H" with an undeniable superficial child romance appeal? A major sensorial object of awakening life?"

"What IS that, mother?" asked little Tim, as Julia took him on a tour of inspection of the tiny garden of the new Murphy habitation.

"A rose, darling."

Biology, chemistry and physics can explain some of the characteristics of the mechanics and processes that constitute the composite, constantly changing living-machine, "rose," but neither Julia nor the scientist could presume to tell little Tim what a rose *is*.

"And what is that, mother?"

"A clothes line, darling." (Likely as not an aerial.)

"And this?"

"A hammock."

"What do you do in a hammock?"

"Rest or read."

"What is 'read,' mother?"

"Oh … what you do with a book."

"'What's a book?"

"Words, words!" – Symbols, in sound, to carry a diminutive degree of understanding into the limbo of goo-goo, broad designators of general categories of discussion.

If baby Tim were never again to be curious regarding the object designated by the sound "book" beyond tearing its niceto-tear pages and dropping them from the hammock to the grass in primary, untutored, flutter-flutter-plop

experiments in tensile strength, gravity, sound and air-resistance effects, he would never know that the audible word-symbol BOOK designates but an indirect means or an instrument to a certain vital objective, namely, the communication of ideas by its author to other minds in a referential form more permanent than if they were to be just orally expressed; a method of broadcast beyond the power of human speech. It would be almost preposterous (though provocative of deep consideration) for Mrs. Murphy to suggest to her child that Newton's "Optics" and "Bringing Up Father" are one and the same article, just BOOK.

From the hammock, Tim could see a mass that seemed to reach into the clouds.

"What is THAT, mother?"

"'s a house, darling. Where we live. All ours … at least it will be when Daddy finishes paying for it. …" A sigh concluded the answer, a sigh born of the faint suspicion that the "good buy" for which Julia and Murphy must skimp for years was not wholly modern.

Julia had not heard of "designed from the inside out," but she was beginning intuitively to sense that theirs was not that kind of house. The house tailors guild, through an enthusiastic house haberdasher, Mr. Jones, had high pressured the Murphys with the usual sample of the "own your own home" propaganda into contracting to pay for a house in Jamaica Gardens. Murph' had been "easy" to sell because he still believed that *any* house is better than no house, and was ready to admit that this one certainly was a distinct improvement over the suite of rooms in a second rate hotel in the vicinity of 34th Street and Sixth Avenue, the noisiest section of the city, that Murphy had been calling "home."

It would seem that the principle of "inside out" is not first to be applied to the tangible house. But the assumption that eventually it must be so applied is seized upon only too often by the sterile, philosophy-dodging dogmatist type of architect who, cleverly and smartly, jumps to conclusions and puts the end at the beginning. This pays him in "good times," when his neglect of principle is applauded and accepted by well-funded, stuffed shirts and skirts. Loathing

to think, they are glad to patronize the professional academicians who, without recourse to boring thought problems, appropriate originality and submit pretty pictures of what is traditionally recognizable as good "front." It goes over both the patron's and his house tailor's head that the result is as shallow and inconsequential as any temporary motion picture set.

It is the usual course of such a professional house tailor to segregate and list the physical units that comprise the whole of the house. Next, having superficially rearranged these physical end-objects, he dogmatically and arbitrarily starts his drafting scheme at the geometric space center (bathroom or chimney) of the habit-postulated-surface of the volume of space ultimately to be controlled (by which the geometrical center was determined) with the sublime conviction that he is designing from the inside out. This procedure is *ipso facto* proof that the architect formulated his plan not only from an envisioned outside inward, further circumvented by a specific "lot line," but from a non-rationalized, habit-dictated "shell." His defense that the outside is "undetailed" at the start of the blue printing and takes form after the inside detailing has been accomplished is just sleight-of-hand trickery, fooling no one but the home-seeking, homesick Murphys.

The vast majority of Mrs. Murphys the world over are so horse-power tired from performing the function of a machine in their utterly inefficient homes as to have little horse-power left with which to concentrate mentally and, therefrom, to articulate rationally in reaction to the natural growth phenomena of the lives in their custody.

The conversationally frugal life of families is relatively unimportant if the only persons affected are adults who have reached a stage where a grunt of assent or dissent is eloquent for harmony. There is no objection to communication with few words, or extravagantly with many *per se,* except that man's intellect and words have evolved hand in hand at so high a price that speech, when resorted to without intellectual reflection, is wasteful, abortive, and paralyzing to the senses in the same way that an incessant radio "deafens" unwilling hearers.

The reaction of tired parents to the natural growth phenomena of the new lives in their custody is one of defense. It becomes expedient progressively to

paralyze such inquisitive growth phenomena in order to effect a simplification of the parents', particularly of the mother's, survival problems. Convenient methods of doing this are:

1. Arbitrary negations imposed by physical strength: "lickings," or "lockings in" or "out."
2. The exploitation of the physical strength of new life: "You don't mind running down to the furnace?" or "To the corner for a pint, dear?"
3. The instillation of fear through the repetition of traditionally honored falsehoods, or by the invention of a lie, a moral, a code, or statute to suit the circumstance. (Fear is not innate. The fear reaction of the new born infant is brought about only by extraordinary noise or falling. If falling does not occur early, fear does not develop as dominant. It is fostered, however, by the exquisite stupidity and cruelty of singing, "Rockabye, baby – baby will fall, cradle and all," and for the child who has experienced falling this is by way of being an ultimate lullaby into lunacy.)

The consequences of carelessly, expeditiously and selfishly answering the young with would-be simplifications is the gradual unfitting of that new life for a naturally developed, comprehensive outlook upon, and non-complexed reaction to, the increasing demands of maturer processes. Thoughtless "simplifications" are paradoxically not only complexity builders but complexity amplifiers. Though born with vast energy and volition for including, analyzing, refining and composing, most people, by the time they reach maturity, have been so progressively exploited or depleted that often there remains nothing of their rich original volition. In its stead, there is listless surrender to quasi-security, inertia, laziness, and, occasionally, vindictiveness. All these results are directly attributable to the mechanical inefficiencies of environment control, which is 95% a shelter problem.

Some point out that the constant din of "housing" is like an over-dose of porridge – that it is a political device employed *ad nauseam*. If it seems that we are stressing "house" overmuch as constituting the "root of all evil" on the one hand, and on the other the area of panacaeic solution of social problems, we answer that very word "economics" springs etymologically from "ecology"

meaning: – *the body of knowledge developed out of* the HOUSE. We stress not *housing* but the essentiality of *comprehensive research and design.*

Both Murphy's outbursts and Julia's fatigue are manifestations of man's growing pains in this most paradoxical period of his history, the paradox being the fact that although science is playing a dominant, behind-the-scenes role in all of the activities of man, mediaeval politics, morals, mysticism and usury are still visibly rampant on the stage. The situation in the human drama may be likened to a scene in the theatre. Backstage, smooth-running mechanisms and scientific light controls are collaborating with the actors who visibly are enacting a mediaeval drama. The great majority of the audience is intuitively aware of the silent backstage machinery, but, in the grip of imagination, prefers to accept the effects as magic.

Through all ages the crowd has relied upon magic. This has been particularly true in the determination of society's commonweal course. The populace has believed in the wizardry of political leaders, who, in turn, have been bossed by big-shot crowd exploiters behind the scenes. This mass reliance upon the politician is oddly contradictory to the average individual's almost fanatic desire for independence.

This desire for independence was temporarily satisfied in man's pathetically funny demonstration in the 20's of "me running it" for the first time.

Men surged out "of a Sunday" in their OWN automobiles to crawl at three miles an hour along limited arteries linking city to suburbia, happy because they were at last "the king himself resplendently *on tour*" – happy despite the slow pace, gas fumes, dust and horn-honkings. *"Get out of my way. … Who do you think you are?"* It was the great family joy-ride era, the beginning of the popular era of "ME-running-IT" as the result of the social incursion of machinery. The hazards inherent in the Murphys' habitual dependency on political leaders, or "somebody else" to make "first" demonstrations is now amplified in the industrial period, wherein ultimate cooperative activity must wait upon a host of correlated inventions, developments, organizations, and vast credit before popularly effective mechanisms can neutralize deleterious causes.

Until the majority of human beings individually perceive that the responsibility for the acquisition of a state of well being for others, and consequently

for themselves, is first dependent on *individual rationalization* and, second, upon uncompromising *coöperative action,* in strict adherence to the former, they will not enter into that estate to which they are the specific beneficiaries by the will of every objectively-scientific human being in all history, some known, others (more often) unknown.

Involved in the foregoing is an attitude that makes the Earthian's problems as easy of scientific solution as are the problem plays of clowns for the children in a circus audience: for instance, the laugh-provoking plight of the clown menaced by a fire attempting to escape through a locked gate that has no fence on either side of it. If the *process of solution* of Earthian problems SEEMS arduous and enormous, it is so only from a size viewpoint, and man as MIND is as large as the universe.

The de-roboting of humanity by the transfer of labor-slavery from life processes to inanimate instruments represents human emancipation. Earliest recorded history reveals armies of human automatons toiling from birth until death, at the instigation of a human-plied whiplash, as elevators of stones for pyramids, patronized by death. That was the real humano-mechanistic era. Man must throw off his slave complex before he can fly.

It is not surprising that those who have grown up in luxury or even in simple well-being under the tradition of "good old superiorities," when experiencing the forces of cosmic equilibrium and the expansion of the universe (which willy-nilly must RAISE standards as upon a flood tide to a par with the mechanisms of their own earlier "exclusive" advantage) interpret the prognostications of leveling as implying an ebb-tide of their own estate, for their reactions are relative to ego.

To the most insensate soul, it must be evident that economic and industrial changes greater than any in history are at hand. The duration of the period of transition will be variable in direct proportion to the intelligence and support given to advancing industry. Prolongation of the transition will work great harm upon the welfare and mental equilibrium of the slothful-minded.

Shelter is by far the greatest single item among man's requirements in point of physical volume, weight, cost and longevity of tenure. Yet it is among the last to receive his *scientific* attention. The time-lag of the building industry – an

industry in name but not yet in fact – is almost beyond belief. For instance, there was a span of 42 years between the invention of Portland cement and the time of application of re-enforced concrete to buildings. This is to be compared with a lag of less than seven years between the attainment of a new speed record in aeronautics and the routine repetition of this speed by commercial air lines. The home building field is still dominated by the activities of the interests in natural materials, who seek either stupidly or helplessly to force a preponderance of their material upon the market. The cement people seek to impose the all-cement house, the lumber people the all-wood house, and likewise with steel or gypsum, or asphalt or asbestos. There is no organized, centralized industry, having a testing, designing, sorting, assembling, distributing and advertising authority, with a definite responsibility to the public, by its advertised ideals of service, guarantee and resale value. All this happens because, through selfish conceit – unable to see ourselves as others see us, we have been laboring under the delusion in regard to housing, despite its having been disproven in all the lesser necessities, that material stylistic deformities and superfluous weight signify the character and individualism of its occupants. What would we think of a man walking the city streets in silks and lace neck ruffle today, or of a lady in a hoop skirt? Would we concede individualistic beauty to a girl with her nose in the middle of her back?

This "conscious withdrawal of efficiency," demonstrated in a willful adherence to mediaeval theories of design (the gaudy Beaux-Arts esthetics) and a profit-minded system of production, has made architecture the most backward of the technologies. Even the newest and most publicized skyscrapers are decades obsolete in terms of what science and industry have rendered attainable. "MODERN" architecture is but a return to basic-classic.

It has always been obvious that the dynamic life going on within a structure is more important than the static structure, but, like so much else that is apparent, this has been generally disregarded, with the result that shelter has been looked upon as an end in itself, and not as a means of life.

Once the problem of shelter service has been solved, the mechanical inefficiencies of environment-control will disappear. "The house will begin to live not by what it brings to the builder, but by what it gives to its occupants, and

by what the latter, reciprocally, bestow upon it. It will become a triumph for the human mind through the human mind":[1] a place in which to live free from worry, free to explore, free to devise, include, refine, free to compose and synchronize.

1 Theodore Larson, N.Y.C., 1931.

4. The Phantom Captain

"What is that, mother?"
"It's a man, darling."
"What's a man?"

Man?
A self-balancing, 28-jointed adapter-base biped; an electrochemical reduction-plant, integral with segregated stowages of special energy extracts in storage batteries, for subsequent actuation of thousands of hydraulic and pneumatic pumps, with motors attached; 62,000 miles of capillaries; millions of warning signal, railroad and conveyor systems; crushers and cranes (of which the arms are magnificent 23-jointed affairs with self-surfacing and lubricating systems, and a universally distributed telephone system needing no service for 70 years if well managed); the whole, extraordinarily complex mechanism guided with exquisite precision from a turret in which are located telescopic and microscopic self-registering and recording range finders, a spectroscope, *et cetera,* the turret control being closely allied with an air conditioning intake-and-exhaust, and a main fuel intake.
Within the few cubic inches housing the turret mechanisms, there is room, also, for two sound-wave and sound-direction-finder recording diaphragms, a filing and instant reference system, and an expertly devised analytical laboratory large enough not only to contain minute records of every last and continual event of up to 70 years' experience, or more, but to extend, by computation and abstract fabrication, this experience with relative accuracy into all corners of the observed universe. There is, also, a forecasting and tactical plotting department for the reduction of future possibilities and probabilities to generally successful specific choice.
Finally, the whole structure is not only directly and simply mobile on land and in water, but, indirectly and by exquisite precision of complexity, mobile in air, and, even in the intangible, mathematically sensed electrical "world,"

by means of the extension of the primary integral mechanism to secondary mechanical compositions of its own devising, operable either by a direct mechanical hook-up with the device, or by indirect control through wired or wire-less electrical impulses.

"A man," indeed! Dismissed with the appellation Mr. "Jones"!

Common to all such "human" mechanisms – and without which they are imbecile contraptions – is their guidance by a phantom captain.

This phantom captain has neither weight nor sensorial tangibility, as has often been scientifically proven by careful weighing operations at the moment of abandonment of the ship by the phantom captain, i.e., at the instant of "death." He may be likened to the variant of polarity dominance in our bipolar electric world which, when balanced and unit, vanishes as abstract unity I or O. With the phantom captain's departure, the mechanism becomes inoperative and very quickly disintegrates into basic chemical elements.

This captain has not only an infinite self-identity characteristic but, also, an infinite understanding. He has, furthermore, infinite sympathy with all captains of mechanisms similar to his.

What is this UNDERSTANDING? It consists in an intuitive, non-graphable awareness of perfection, or of unity, or of eternity, or of infinity, or of truth. This awareness of perfection serves as a universal yardstick relative to which any sense experience may be measured, and by virtue of which CONSCIOUS SELECTION may be made.

("This is a better pair of shoes." How does one know? Because it the more closely approximates a "perfect" pair – the "perfect" pair that will *never* hurt, wear out, become dirty, or have weight. "Perfect," though impossible of demonstration, is nonetheless the criterion of selection. "Perfect" is not only a *direction,* but a *time direction,* "perfection" being *never* in "reality" attainable. There is herein to be discerned the meaning of *Never, Never Land.* Children dream truly.)

By the process of conscious selection relative to sense of perfect, the segregation of such phenomena as sounds has developed, followed by the selective recomposition of the segregated sounds into specific sound-continuities, or "words" (sound symbols) provocative of basic understanding in others,

adequate for the *moment*. No matter how relatively imperfect the articulation, or the receiver-conception, there is nonetheless some characteristic of "uniformity," though not of "identity," of understanding between sender and receiver. For instance, the word "cow," ("black-white," "daisy" or "bossy" are inconsequential) conveys the concept of a mechanical process which is substantially understood as a composite "cow" – the milk factory. Each phantom captain for himself, however, associates "cow" with the most vividly impressive cow of his particular experience, the speakers a Jersey, the listeners a Guernsey.

This infinite communicating code, based on processes and continuities and not on static fixation identities, enables the phantom captain to signal, via the complicated visual, aural and oral, tactile and olfactory systems of his machine, to captains of other machines, who receive the message through complementary mechanical systems of reception. The success of the transmission depends upon the relative degree of communicated understanding, i.e., upon how "time"-rationalizing vs. statically-reflexing the receiving captain may be.

Curiously, each captain is so impressed by the command of such an elaborate mechanism and one so excellently attuned to operation that it readily yields to his un-self-conscious guidance of its processes and instruments, that he feels himself thrillingly and virtually a part of it. Only when the parts are abused is there awareness of a seemingly separate presence of parts; for instance, when the tongue has been bitten or burned its motions are painful whereas normally it wags merrily, carelessly and unnoted.

Inevitably, the captain's habitual association of his infinite self with his subconsciously subservient mechanisms has inclined him to a dual "presumption": (i) that this mechanism is an ACTUAL (by extension) part of his phantom self, whereas it is purely an electro-chemical combination of inanimate energy molecules that are intrinsically the ship the phantom captain commands, and (2) an attitude of ownership: the mechanism of ordination for his will is "his" permanent "possession," whereas in reality it is only temporarily in his custody. This illusion of "possession" of the mechanism has been further extended, through accustomed relationship, to include "possession" of one's clothes, pencils, house in general, land, friends, wife and children,

business, state, nation, world, and, finally, "God" – the last named quite naturally being "pictured" in the exclusively original form of his "own" egotistically important, special mechanistic and chemical process arrangement.

As the "possessor" of all of his extensions, the phantom captain automatically evolves a myriad of illusory necessities for which he assumes a vain, egotistical responsibility. This false-possession and always innocuous myth (which is consumptive of the complete lifetime, from four years onward, of the vast majority of people) stone-blinds the possessor to the simple, delightful truth-trends that are everywhere and at all times about us. For unspoilt children and happily debunked, emancipated grown-ups, these trends make life's courses as evident as a highway through a meadow. Ironically, the non-possession-blinded person's citation of evident trends has always been fearfully hailed as witchcraft, mysticism and quackery by the still mystified, self-be-quackeried majority.

The phantom captain is but mildly shaken in his preoccupation, or possession obsession, by the intermittent necessity of replacement of "his" parts, or by the dissection from, or application to, his mechanism by other phantom-captained mechanisms of such service parts as crude gold inlays inserted in "his" raw fuel crushers, additional lenses or color-filters for "his" rangefinders, or an enema bag douching nozzle temporarily passed into "his" clogged canal. The inlay or the douche bag is, temporarily at least, as factually connected to self as a toe nail, tooth, hair, or eyeball.

This continual arrogation of "his" mechanisms is closely allied with the captain's habitual assumption that all objects are "seen" at locations outside the phantom captain's mechanism, whereas actually the captain "sees" them inside his turret through his peritelescopic range finders. A long history of mechanical reliability – attested by frequent accurate measurements of the deduced range of, and direction to, an object's external location with the ability to move a crane grappler into an assumed location so that contact with the discovered object is provided, and further attested by the receipt in the turret of affirmative telephone reports, from several of the myriad contact alarms in the crane grappler – seems to justify the captain's habit of thinking "I SEE IT OVER THERE."

The phantom captain's habitual notion not only that he is part of "his" mechanisms but that the mechanisms are himself, is extended still further. He frequently confuses the surface characteristics of other "observed" mechanisms, similar to those he controls, with the identities of the phantom captains controlling them. Forgetting the true, infinite *phantom* character of the other captains, he "logically" evolves two additional illusions: One of these is that the commanded mechanism of the other captain is all that there is to that other phantom captain; the other is that the *surface* is all there is to that mechanism. In other words, he assumes that the tangible surface of the "other" "person" *is* that person's phantom captain, and that this *surface alone* is "reality." (This is the "reality" of the "practical" minded or materialism-dominated personality.) So he customarily interprets the behavior characteristics of the whole of another's mechanism by surface clues only; there has actually developed a language in terms of surface reflexing.

To illustrate: If Mr. and Mrs. Murphy, out for a walk with baby Tim, were to see a plane flying overhead, they might readily exclaim to "darling," "See that aviator!" They might easily be wrong. Planes are being ably controlled by radio without a human pilot on board.

An illuminating rationalization indicates that *captains* – being phantom, abstract, infinite, and bound to other captains by a bond of understanding as proven by their recognition of each other's signals and the meaning thereof by reference to a common direction (toward "perfect") – *are not only all related, but are one and the same captain.* Mathematically, since characteristics of unity exist, they cannot be non-identical.

The phantom captain's *executive officer,* yclept "brain," is a mechanistic device similar to the metal "mike" of the Sperry gyroscope, whose gyroscopic directional-insistence, useful though it is while the captain is absent from the bridge is nonetheless provocative, if unwatched, of habit grooves of motion.

When the complexity of the metal "mike" currently used in aeroplanes and aboard ship in hands-off navigation is compared with that of the "mike" or "brain" of the human phantom-captained mechanism, it is as though one contrasted an Ingersoll watch and a battleship, in the matter of number of

parts and precision of operation, except that the human "mike" is as small in relation to the metal "mike" as are the new complex seven-element, glass-lined metal radio tubes "small" in relation to their crude, large three-element forerunners.

The "mike" of the human ship may be "set" by the phantom captain to detect the slightest lack of balance, not only in every one of the ship's external relationships but in all of its interior synchronizing mechanisms. So many settings does "mike" carry, at most times, that he seems ALIVE, and he is so satisfactory to the captain that the latter flies the human ship "hands-off" much of the time. This possibility of hands-off flying encourages the phantom captain to regard the "mikes" of other phantom captains, also, as almost alive – that is, animate rather than animated.

Such a mistaken assumption of surface clues for reality must inevitably lead to a myriad of misunderstandings and erroneous conclusions, into "blind alleys" and "dead end" streets. This is just what happens when (rationalization of an illusion being *ipso facto* impossible and illusion being no further extensible, on the occasion of "death" or the abandonment of a mechanism) those "individuals" whose captains are still at their posts and who are still confusing themselves with the mechanism they are directing, ceremoniously "bury" the abandoned, now disintegrating mechanism under the impression that it is the captain whom they "honor." They might as well bury the can opener that "he" customarily used and which he regarded as "his." Indeed, it would honor the phantom captain more to bury his can opener, since it is a device rationally objectivized by him and is, therefore, more directly creditable to him than the involuntary custody and management of the unit mechanism he had under "his" control. The cans he opened might, also, be honored by burial in dirt.

There are two main types of phantom-captained mechanisms, differing only in their machinery for the reproduction of miniature replicas of themselves (a manufacturing process). The union of these complementary types, or "plants," allows the electro-chemical processing of raw materials into infinitely elaborate, replica structures and instrument ensembles.

There are, of course, innumerable subtypes of the male and female main types, varying widely in external color, size, smell and textural characteristics. In fact, no two are physically identical, although they are miraculously *uniform* from a mechanical, chemical, structural, and process characteristic viewpoint, even to the maintenance of an identical thermal characteristic which, when the machine is in proper running order, is 98.6° F. under most highly diversified exterior environment conditions.

When one of the phantom captains seeks a mechanism of the complementary type to join with his in the manufacture of an improved model replica of their mutual custody mechanisms, he misinterprets his un-self-conscious appraisal of the adequacy of the observed complement to his "own" half-plant as constituting suitable hook-up conditions in the terms of superficial or sensorial-surface-satisfactions. The result is often the peculiarly amusing selective sound-wave emission, through the major exit-entrance aperture of the turret, "BEAUTIFUL!"

Phantom captains have fallen into such a careless mythology of surface words and nicknames, to excuse slothfulness in telegraphing accurately the observed external phenomena to the turret laboratories, that, although Murphy's phantom captain meant by "beautiful" that he had noted in Julia a mechanism that was highly uniform, i.e., not deformed, and, therefore, so far as he was concerned one that was favorable for plant hook-up, he probably further elaborated inaccurately and meaninglessly, "Julia is the MOST BEAUTIFUL girl in the world!" (The writer does not mean to infer that he does not say "beautiful," and believes that he means it, over and over again.) Murphy also probably would say, "My Julia is a PEARL!" and send her a "rose," the latter being a broken-off portion of another highly intricate, phantom-captained mechanism, but of so relatively wide non-identity with the "Julia" mechanism as to allow of its becoming a "living" sacrifice on the altar of the Julia manufacturing-plant worship.

Had Murphy failed at first to convince Julia of favorable conditions for plant hook-up, through surface clues observable by her, he would not have ceased his campaign. No, he would have sought to impose on Julia an *illusion* of satisfactory surface clues, by altering his surface conditions – such as adding to

the size of his turret with a new "fedora," or subtracting from its size by cutting off part of his hair – just as Julia, were the situation reversed, would have "dressed ship" in velvet "washed down" with attar of roses.

It has been but a step from false adornment and artificial surface extensions of the human body, in the matter of clothing, to shelter; and from shelter to the myriad of tools and instruments that were rationally evolved at an earlier time by the phantom captain in the extension of his own mechanism. The tools were born of the necessity to perform a specific function either with greater precision or with greater leverage than could be effected by the integral mechanism of the primary machine, – a tooth-pick, for instance, is better than a fingernail for tooth-picking and is more expeditiously replaceable.

The Murphys are not content, as their "wealth" (mechanical extensions) increases, with simple tooth-picks. Unless completely bereft of "hook-up" potentials, they will probably go in for gold tooth-picks, even gold filagreed tooth-picks, "individualistic" tooth-picks; embroidered roofs and arches; tattooed everythings.

So pleased are human beings by the artifices with which they constantly attain *self*-satisfaction, *despite* bad hook-up conditions, that they experience a constant urge to evolve codes of morals, ethics and laws for the purpose of making permanent the conditions of self-satisfaction that they have attained by artificiality. Out of these morals, ethics, artifices and vanities have been evolved so many "mike" sayings or brainistic words, that, although they are utterly meaningless from the viewpoint of the true phantom captain, they constitute 99% of today's broadcast, printed and person-to-person communication.

The artificial illusion extensions provided by the momentum of the gyroscopic "mike" display a wide range in various races variously located. For instance, when Doctor Jung, able student of psychology, made an extensive visit to Africa for the purpose of carrying on basic psychologic studies, he discovered that the primitive people there demonstrated a most interesting seemingly factual illusion extension from their simple experience memory storage. What had been regarded as purely ghost or demon fabrications, inherited through

mythical tradition, proved to be none other than vivid memory concepts. When a leader or a parent died, the people had such simple, clear, visual memory pictures of the deceased that they were able satisfactorily to objectivize him as though still in bodily presence. In other words, they simply reversed our particular civilization's assumption that we SEE objects at a point EXTERNAL to our self-mechanism, although, in fact, the seeing is done, not even in the eye but in the brain or reception end of the nervous system that records the exterior light reflections.

Jung found, also, that African primitives, in common with others throughout the world, have such a simple cosmic problem that they have only two categories of numbers, *viz,* "*one*" or "*many*." Because they "SEE" either "one" or "many," they have evolved fabulous legendary stories. They recognize that one stranger may be readily matched in physical combat, whereas two or more may be overpowering. So two or three or more strangers are "seen" as hordes, the fear instinct warning the beholder of the risk of being overcome. Combining this "seeing" of either "one" or "many" with the extension of a SEEN factual memory form of a father or leader calls forth the illusion of the close proximity of multitudes of fathers, leaders, demons, *et cetera.*

There is, also, a tracery of the simple number sense limitation in certain old cultures. In Chinese, for example, one carriage is a carriage, many carriages are "noise." The Chinese symbol of "tree" is one tree; "two trees" equals "woods," and "three trees" constitute a "forest" – one, few, many.

Jung had the strange experience of noticing that, while he was endeavoring to understand primitive illusions, his own particular modern civilization's illusion broke down to such an extent that he, too, began to "see" partially in terms of the primitive illusion and partially in his own earlier illusion, with the result that he seemed to himself almost to be crazy, for there was no reliability in any illusion.

In connection with the phantom captain's illusion that the mechanisms of his survival are an intrinsic part of his abstract self, it is to be noted that every physical extension has been a matter of survival adequacy in the phantom captain's command of specific animal and vegetable species. It might almost be said that a new "type" of human animal has developed in

the United States and that this type is by way of being an advance demonstration of a world-wide type, inasmuch as the evidences are all in terms of scientific world trends. When a sufficient number of members of a species has become characterized by relatively identical extensions, these extensions may properly be called part and parcel of the "being"-entity of that species.

If we will admit that a section of Julia's hair is just as much Julia's hair after it is cut off as it was when on her head – and it certainly is as much Julia as is the name "Julia," which is a most arbitrary appendage – we must admit, also, that if Julia's cut-off hair were woven into a fabric and worn on her head in the form of a hat, everything in the ensemble would still be "Julia." This would apply equally to any other hat that Julia might don or to the pigment which, for improved hook-up allure, she might apply to her lips and cheeks. Everything that Julia uses in her sometimes by-seeming selection, and again by-inadvertence choice, is "Julia."

The phantom captain of the butterfly has a great variety of mechanical externals for survival, but the apparently different stages of moth-caterpillar-chrysalis-butterfly in no way alter the identity of the phantom captain, which persists as unity throughout. Similarly, at sea, the various ships that Captain "Smith" commands are known to his contemporary skippers simply as "Smith." As Smith's ship, the Mary, appears on the horizon they exclaim, "Here comes Smith!" Smith may change commands but the other skippers will continue to say, "Here comes Smith!" whenever they recognize the externals of the ship he happens currently to be commanding.

In the United States passenger automobiles number approximately one per family, and the head of the family is usually the driver thereof. So accelerated are the time-space characteristics of the auto in comparison to the time-space covering ability of the man on legs that every reflex characteristic of the phantom captain of the driver is amplified in direct proportion to the time-space differential between the car's and the unmounted driver's tactical maneuvering ability. People who are not recognized as nervous or physically unbalanced while walking and talking are often seen to be distinctly so in their operation of an automobile. The traffic manners and ethics of people

while driving reveal their character as a whole far more readily than would their cultivated mannerisms and behavior while walking.

Holding the full significance of this thought in mind, one can suddenly comprehend, while driving along a heavy traffic artery, that the automobiles seen are extensions of their drivers, just as are the "drivers'" hats, coats, shoes and faces; it is the progression of boxes within boxes of childhood play. Accepting this rationalization of man's unity extending into his automobile, it may be said that the average young working American man now weighs better than a ton, since the average automobile weighs 2,800 lbs., and that the composite American extensible into his group mechanisms (aeroplane, railroad train, the *Normandie,* and Boulder Dam) is larger by millions of times than any historical animate organism. It is quite possible that Lewis Carroll was writing the poetry of this concept in *Alice Through the Looking Glass.*

There is another interesting phase of the phantom captain phenomenon. There is to be distinguished in the current era – as differentiated from the early crafts period of individual survival without the aid of mechanical extensions – a set of mechanisms, such as the power dynamo in the city, mutually commanded by phantom captains. When either Julia or Murph' pushes a certain button, the act serves to bring about a mechanical extension of the visual ability of both, although "seeing," let us remember, occurs within the turret and not externally to the mechanism of the phantom captain. This introduces an extraordinary rationalization, namely: Industrial mechanisms so gargantuan as to be without warrant as an extension of any one person are justifiable as extensions of multitudes of persons, proving to mathematical satisfaction that all people, of a species characterized by participation in the use of such mutual extension mechanisms, are one and the same person at the time of such utilization.

This conception of the phantom captain leads to a viewpoint quite the opposite of the "mechanistic" bogey so fearfully heralded and decried in recent years because of an apprehension that the man-created machine will overpower man somewhat as would a Frankenstein monster.