

SCIENCE

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THE NATURE OF MAN¹

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A FEW years ago, as you may remember, Élie Metchnikoff published a book entitled "The Nature of Man: Studies in Optimistic Philosophy." If you have read that interesting work, you know that it is chiefly concerned with the great problem of death—with the problem, that is, of adjusting human emotions and human understanding satisfactorily to the common doom of living creatures. In Metchnikoff's view that problem has been mainly responsible for the existence of religions and philosophies. In his belief religions and philosophies have not been able to deal with the problem satisfactorily; but their failure, says he, is no reason for despair; for it is his conviction—and here we see why he deemed his study to be one in optimistic philosophy—that the problem can be satisfactorily solved by science and in particular by the science of biology, for the process of dying is one of the processes of life. And so his book aims at being an important contribution to what may be called the science or the philosophy of death.

I hope that this address upon "The Nature of Man" may appear to you, as it appears to me, to be, likewise, a study, or the result of a study, in optimistic philosophy. It is not of death, however, that I intend to speak, but of life. I desire to look towards the possibility—to contemplate the possibility—of a valid philosophy, or a science, of human life.

The core of my message is a certain concept—a concept regarding the essential nature of man. The concept is, I believe, both new and important—strictly new, if I be not mistaken, and tremendously important. This judgment I may express with propriety because the idea

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in question did not originate with me. I should be proud if it had. I encountered it a little less than a year ago in an unpublished manuscript which by good fortune it became my privilege to examine. And so the conception is mine only by acquaintance, by meditation upon it, by a steadily growing sense of its significance, and by adoption—adoption of it, I mean, as an inspiring idea of great beauty and as a fruitful working hypothesis. The manuscript, I am happy to report, is now being published (by E. P. Dutton and Company) in the form of a book entitled “The Manhood of Humanity: The Science and Art of Human Engineering,” and will appear very soon. The author of it is a Polish nobleman, Count Alfred Korzybski, a native citizen of Warsaw, by temperament a poet and philanthropist, by training and experience a mechanical engineer and soldier, twice wounded in the war; about six years ago transferred as a military expert to North America where, both in the United States and in Canada, he worked hard in the cause of freedom.

The book is, in my opinion, a momentous contribution to the best thought of these troubled years—momentous in what it contains, even more so in what it suggests, and most of all, I dare say, in the excellent things it will eventually help men and women to think and say and do. I am not going to review it on this occasion. Having examined the work carefully and reflected much upon it, I am convinced that its significance can be grasped and felt, not indeed by reading or listening to any review of it, but only by reading the work itself, re-reading it and pondering it. What I purpose to do is at once something less and something more—I hope a good deal more—than the submission of a review. The work deals with a wide variety of ideas; these do not constitute a mere collection; they constitute a system—the ideas are connected—logically connected—spiritually interlocked in many ways. It happens that among the ideas of the system there is one which dominates all the rest, binding them together, giving them their proper order, their life, their light and their significance—its place in the system

is like that of the sun in the solar system. That central idea is Korzybski's concept of Man—a concept of what is characteristic of humankind; it is, in other words, a thesis purporting to state what that is in virtue of which we human beings are human. I desire in the first place to present that thesis, or conception, as clearly as I can, for your consideration both now and in the future; it will be my further aim to indicate, in so far as time allows, some of the bearings it seems to me to have upon the cardinal interests of mankind.

The task is not easy to perform well in the time at our disposal. In trying to perform it, I am going to invite you to join me in an attempt to do a little fundamental thinking. I extend the invitation confidently for the reason that the mood of such thinking is the only mood that befits the times. The World War has indeed constrained us to think about realities as we never thought before, and there is one thing of which we are all of us convinced—it is only by thinking of realities that we may hope to solve the pressing problems of the world. That is a great gain and is full of promise but it is only a beginning. In this presence it is unnecessary to argue that in dealing with realities it is of the highest importance to have just conceptions of them; I desire to emphasize the prime importance of concepts that correspond to facts; certainly in this presence it is unnecessary to argue that, in order to deal successfully with the great human problems of our time, it is not sufficient to have enthusiasm, sincerity and goodwill; we know that, in addition to these excellent things, it is indispensable to acquire true conceptions of the realities involved. Now, of all the realities with which we humans have to deal, of all the realities involved in the present perplexities of the world, it is evident that the supreme reality is man. It follows that of all the questions we human beings can ask—of all the questions which in reflecting upon the ills of our time we *must* ask—the supreme question—the most fundamental question—is: What is man? What is a human being? What is the defining or

characteristic mark of humankind? In the scheme of nature, what is the place—the distinctive place—of the human class of life?

The sovereign importance of that question seems perfectly evident and is thus evident *a priori*. Have we propounded it to ourselves? In the published thought of recent years I see no sign that we have; if we have, it seems not to have led us to the discovery of anything fundamentally new or fundamentally important. It is safe to say that we have not asked the question—at all events not seriously. And it seems a bit strange that we have not; for many questions closely connected with it and naturally leading to it we have asked. Rudely reminded of the dismal things of human history, we have asked: What is the explanation of them? Can we prevent their recurrence? And, if so, how? Keenly aware of the present plight of the world, we have asked: What is the cause? Are we humans under the dominion of a malevolent fate? Or is there a cure? And, if there be a cure, what is the remedy? In trying to answer these great questions, we have been led to ask others—questions about ethical systems or ethical beliefs, about national or racial philosophies, about education, about industrial methods, about economics, about jurisprudence, political science and theories of government. We have beheld the amazing progress of invention, of natural science, of mathematics, and the technological sciences; we have seen their swift conquests of space, time, and matter; we have seen our globe thus rapidly reduced to the small dimensions of an ancient province; we have seen many peoples of divers tongues, traditions, customs and institutions consequently constrained to live together as in a single community; we have seen that there is thus demanded a new ethical wisdom, a new legal wisdom, a new educational wisdom, a new economical wisdom, a new industrial wisdom, a new political wisdom, a new wisdom in the affairs of government; for the new wisdoms our anguished times cry aloud; we have heard the answers—which are in the main but reverberated echoes of the wailing cry mingled with the chattering voices

of excited public men who know not what to do; knowing that the welfare of the world, since it depends at once upon *all* the cardinal forms of human activity, demands team-work of them and therefore *equal* progressiveness in all of them, we have compared the swift advancement of the genuine sciences, on the one hand, with the slow, uncertain, halting pace of the so-called social sciences, on the other; we have been astounded by the contrast; in the crumpled and broken condition of our civilization we behold the appalling consequences of the mighty disparity; and so we have asked why it is that the social sciences—of ethics, education, jurisprudence, economics, politics, and government—have lagged so far behind the forward strides in the other great fields of human activity that the system of human relationships throughout the world has been strained and torn asunder like an immense network of wire rent by a cyclone. This very important question has led to some curious results. It has led to the invention of doctrines that alarm, to proposals that startle,—doctrines and proposals that we are wont to call radical, revolutionary, red. Is it true that our thinking has been too radical? The trouble is that, in the proper sense of that much abused term, our thinking has not been radical enough. Our questionings have been eager and wide-ranging but our thought has been shallow; it has been emotional and it has been daring but it has not been deep. We have indeed known that the character and status of the so-called human or social sciences depend upon what man *is*; but we have not reflected upon the fact that they depend also, in equal or greater measure, upon what we humans *think* man is. The fact of this fundamental dependence, had we considered it, would have led us to a further reflection—it would have led us to wonder whether the backwardness, the mediæval-mindedness, the disastrous lagging of the social sciences may not be due to their having at their base or in their heart a fundamentally false conception or false conceptions of what is really characteristic of humankind. It is evident that, if

our thinking had reached that point, we could not have failed to ask ourselves the supreme question: What is man?

Why have we not in these times asked that fundamental question? Doubtless it is because we have assumed, in the main unconsciously, that we know the answer. For why enquire when we are sure we know? Is our assumption of knowledge in this case just? Have we really known, do we know now, what is in fact the idiosyncrasy of the human class of life? Do we critically know what we, as representatives of man, really are? Here it is essential to distinguish; we are speaking of knowledge; there is a kind of knowledge that is instinctive—instinctive knowledge—immediate inner knowledge by instinct—the kind of knowledge we mean when we say that we know how to move our arms or that a fish knows how to swim or that a bird knows how to fly. I do not doubt that, in this sense of knowing, we do know what human beings are; it is the kind of knowledge that a fish has of what fishes are or that a bird has of what birds are. But there is another kind of knowledge—scientific knowledge—knowledge of objects by analyzing them—objective knowledge by concepts—conceptual knowledge of objects; it is the kind of knowledge we mean when we say that we know or do not know what a planet is or what a number is. Now, we do not suppose fish to have this sort of knowledge of fish; we do not suppose a bird can have a just conception—nor, properly speaking, any conception—of what a bird is. We are speaking of concepts, and our question, you see, is this: have we humans a just concept of man? If we have, it is reasonable to suppose that we inherited it, for so important a thing, had it originated in our time, would have made itself heard of as a grave discovery. So I say that, if we have a just concept of man, it must have come down to us entangled in the mesh of our inherited opinions and must have been taken in by us, as such opinions are usually taken in, from the common air, by a kind of “cerebral suction.”

Well, what are the concepts of man that our generation has thus inherited? Broadly

speaking, they are of two types. One of them is biological or zoological; the other one is mythological. Some of us hold the former one; some of us the latter; and some of us probably hold both of them; for, though they are mutually incompatible, mere incompatibility of two ideas does not necessarily prevent them from finding firm lodgment in the same brain. According to the zoological conception, man is an animal—a kind or species of animal. This conception has at least one merit—it regards human beings as natural—as creatures having a place in the scheme of nature. This merit the mythological conception has not; according to it, man has strictly no place in nature—he is indeed neither natural nor supernatural but is both at once—a kind of miraculous union, compound, or hybrid of the two. Such, then, are the concepts of man that now reign throughout the world and that have so reigned from time immemorial. And such are the concepts that have fashioned our so-called human or social sciences in so far as these have been and are fashioned by what we humans consciously or unconsciously *think* man is.

Are the concepts true? Or rather we must ask—since they can not both of them be true—is one of them true?

It should not amaze us to find that both are false; for the concepts are man's and their object is man; thus the difficulty is unique; it is that of a self-conscious being having to regard its kind as an object and rightly conceiving what the object is. In respect of the mythological conception, there are no doubt some who are disposed to treat it ironically as only the other day it was treated by Plato, for example. “We must accept,” said he, “the traditions of the men of old time who affirm themselves to be the offspring of the gods—that is what they say—and they must surely have known their own ancestors. How can we doubt the word of the children of the gods? Although they give no probable or certain proofs, still, as they declare that they are speaking of what took place in their own family, we must conform to custom and believe them.” But this gentle irony—the way

of the Greek philosopher—is not the way of the Polish engineer. The latter is not indeed without a blithesome sense of humor but in this matter he is tremendously in earnest; deeming it to be immeasurably important for all mankind, he treats it with the utmost seriousness; and he bluntly affirms, boldly and confidently, that neither the mythological conception nor the zoological conception of man is true; he denies outright that man is a species of animal and similarly denies that humans are compounds of natural and supernatural.

What is the error in those traditional conceptions? It is, he contends, of the same kind in both of them, and the kind is fundamental. It is the kind of error that consists in what mathematicians call confusion of types and what Korzybski calls mixing of dimensions. Let me explain; I have only to remind you of what everybody knows. And the simplest explanation is the best. You and I may speak of, say, the class of geometric points or of the class of spheres but we can not speak logically of a class composed of points *and* spheres for there is no such class; or we may speak of the class of water-drops or of the class of oceans but not logically of a class of water-drops *and* oceans; the types are different and must not be confused; to talk as if there were such a class is to talk nonsense, and it would be the same if we tried to discourse rigorously about a class composed of stars *and* rays of light; it would be to chatter as if there were no such thing as logic, or laws of thought. The matter is even clearer in terms of dimensions, or dimensionality; pardon me for dwelling upon it—it is so very important: here is a straight line—it has length only—it is a one-dimensional thing; it is not a point; it does contain points and it has some point properties, but, if on this account we called it a point, we should be guilty of a type-confusing blunder; next consider a surface, say a plane—it has length and breadth—it is a thing of two dimensions; it contains points and lines and it has certain point properties and certain line properties; but we do not call it a point or a line; if we

did the blunder would be a dimension-mixing blunder; once more, here is a solid, say a cube—it has length, breadth and thickness—it has three dimensions; it has surfaces and it has certain surface properties, but it is not, therefore, a surface; if we called it a surface or if we were to say it is a surface mysteriously combined with some miraculous influence from outside the universe of space, then in either case we should be guilty of treason against the eternal law of types or dimensions.

In the light of such elemental considerations we are going to see very soon and, I hope, very clearly what kind of beings we humans are according to Korzybski's concept of man and at the same time why he condemns the traditional conceptions as false. Consider the great life classes of our world—consider their patent cardinal distinctions and relations candidly and open-mindedly; and let us begin with the class of plants. I offer, as I need offer, only a rude sketch. Plants, we say, are living things. How are they characterized as a class, positively and negatively? They take in, chemically transform, organize and appropriate the basic energies of sun, soil and air; but they have not the *autonomous* power to move about in space; together they constitute the lowest order or class or type or dimension of life—say, for convenience, the life dimension I; being, as indicated, binders of the basic energies of the world, the plants are, in Korzybski's nomenclature, the basic-energy-binding, or chemistry-binding, class of life. What of the animals? What, I mean, are we to say of the creatures traditionally designated as the "lower" animals? Like the plants, animals, too, take in, transform, organize and appropriate the energies of sun, soil and air, though in large part they take them already prepared by the plants; but unlike the plants, animals possess the *autonomous* power to move about in space—to creep or crawl or swim or run or fly; it is thus evident that, compared with plants, animals belong to a higher type or dimension of life—say the life dimension II; the classification we are here interested in, you see is broad; because they are distinguished by

their autonomous power to move, to abandon one place and occupy another and so to appropriate the natural fruits of many localities, the animals are called space-binders—the space-binding class of life.

And now we come to the crux. What are we to say of man? Like the animals, human beings have the autonomous power to move—the capacity for binding space—for taking now one and now another “place in the sun” with the goods thereof, and it is plain that, if human beings had no capacity of *higher* order, men, women, and children would indeed be animals. But what are the facts? Be good enough to examine them carefully; they are familiar; let us, if we can, reflect upon them as if they were unfamiliar, for that is half the secret of philosophy and of science, too. Long, long ago, a quarter or half million years ago, there came into existence upon this globe—no matter how—a new kind of beings; they did not know what they were; they knew nothing of the world, nothing of its size or shape or place in the universe, nothing of its resources, their locations or properties, nothing of natural law; they were without guiding maxims, precepts or precedents; they had no science, no philosophy, no art, no wealth, no instruments, no history—not even tradition: their ignorance was almost absolute; and yet, compared with the animals, which they hunted and which hunted them, they were marvels of genius; for there was in them a strange new gift—a strange new energy—that mysterious power in virtue of which they did that most wonderful of all things—*initiated* the creative movement called civilization. That power, first manifest in the infancy of our race, is the power that invents, the power that imagines, conceives, reasons; it is the power that makes philosophy, science, art and all the other forms of material and spiritual wealth; the power that detects the uniformities of nature, creates history, and foretells the future; it is the power that makes *progress* possible and actual, discerns excellence, acquires wisdom, and, in the midst of a hostile world, more and more determines its own

destiny. The animals have it not or, if they have, they have it in a measure so small that we may neglect it as mathematicians neglect infinitesimals of higher order. Do not fail to observe *how it relates us to that mysterious thing called Time*, which so many thinkers—psychologists, philosophers, astronomers, physicists, and mathematicians—are just now as never before engaged in studying, each in his own way. By virtue of that familiar yet ever strange human power, each generation inherits the fruit of the creative toil of bygone generations, augments the inheritance, and transmits it to the generations to come; thus the dead survive in the living, destined with the living to greet and bless the yet unborn. If this be poetry it is also fact. Past, Present and Future are not three; in man they are spiritually united to constitute *one living* reality. And now we behold, and are at length prepared to grasp, Korzybski's great Concept. Because this capacity for binding time, under a law of ever-increasing amelioration, is *peculiar* to man or is at all events his in an incomparable degree, the class of human beings is to be conceived and scientifically defined to be the Time-binding class of life. We have here, you see, a new dimension, a new type, of life—life-in-Time. Animals are binders of space; man is a time-binder. Allow me a word of caution. Since, like the animals, man, too, binds space, may we not say that man is a time-binding animal? No; to say that would be the same kind of blunder as to say that a solid is a surface because it has surfaces and some surface properties or to say that fractions are a species of whole numbers because they happen to have some of the properties of whole numbers. It is fatal to confuse types, or to mix dimensions. Time-binding activity—the defining mark of man—may involve and often does involve space-binding as a higher involves a lower; but to say that, therefore, man is a species of animal—a time-binding species thereof—is like saying that a solid is a species of surface or that water is a species of oxygen or that wine is a species of water or that a violin is a species of wood

or that definite integration is a species of addition or that a symphony is just a species of sound.

Such, then, is the new conception of man—the conception of a being whose character and appropriate dignity consist in his peculiar capacity or power for binding time. The nobility of the conception is obvious, unmistakable. It has two other marks that belong to all really great ideas—it is intelligible to all and is universal in its interest and appeal. Your sense of its significance, if your experience repeats my own, will grow as you meditate upon it, for its significance, I do not doubt, is mighty. The author, I believe, is right in his belief that it marks the beginning and will guide the development of humanity's manhood. I wish it were possible to examine here some of its bearings on the cardinal interests of mankind; but "the hour contracts" and I can do no more than barely allude to a few salient considerations.

One of them is that, though we human beings are indeed not a species of animal, we are *natural* beings: it is as natural for us to bind time as it is natural for fishes to swim or birds to fly.

That fact is fundamental. Another one, also fundamental, is this: time-binding power—the characteristic of humanity—is not an effect of civilization but is its cause; it is not civilized energy, it is the energy that *civilizes*; it is not produced by wealth, whether material or spiritual, but is the source and creator of both.

I come now to the gravest of considerations. Inasmuch as time-binding is the characteristic of humanity, to study and understand man is to study and understand the nature of his time-binding energies; the laws of human nature are the natural laws of these energies; to discover these laws is a task of supreme importance for it is evident that upon the natural laws of time-binding must be based the future science and art of human life and human welfare.

One of the laws we already know—not indeed precisely—but fairly well—we know its general type—and it merits our best atten-

tion. It is the natural law of progress in time-binding, or civilization-building. Let us glance at it. Each generation of (say) beavers begins where the preceding generation began; that is a law for animals—there is no advancement, no time-binding—a beaver dam is a beaver dam. Contrast this with human life. Man invents and discovers and creates. An invention or discovery or creation once achieved, what happens? Each invention leads to new inventions, each discovery to new discoveries, each creation to new creations; invention breeds invention, science begets science, the children of knowledge and art and wisdom produce their kind in larger and larger families; each generation begins, not where its predecessor began, but where it ended; things done become instruments for the doing of better things; the Past survives in the living achievements of the dead; the body of these achievements—invention, science, art, wisdom—is the living capital of the ever passing Present, inherited to be held in trust for enlargement and for transmission to Future man; the process is that of time-binding: Past and Future are thus united in one eternal Now owning a law of perpetual growth and continual progress. What is the Law thereof—the natural law? You see at once what it is: it is that of a rapidly increasing geometric progression—if P be the progress made in a given generation, called the first, and if R be the ratio, then the progress made in the second generation is PR , that in the third PR^2 , and that made in the single T th generation will be PR^{T-1} . Observe that R is a large number and that the time T enters as an exponent—and so the expression PR^{T-1} is called an *exponential function of Time*. This is an amazing function; as T increases, the function not only increases but does so at a rate which itself increases according to a similar law, and the rate of increase of the rate of increase again increases in like manner, and so on endlessly, thus sweeping on towards infinity in a way that is truly marvelous. Yet that is the law—the natural law—for the advancement of civilization—

immortal offspring of the marriage of Time and human Toil.

And here arises a great question which I have hardly time enough to touch. The question is: Has civilization always advanced in accord with the mentioned law? And, if not, why not? The time-binding energies of man have been in operation long—300,000 to 500,000 years, according to the witness of human relics, ruins and records of the caves and the rocks. If progress had followed the mentioned law throughout that vast period, our planet would no doubt be now clothed with a civilization so advanced that we are powerless to imagine it or to conceive it or even to conjecture it in dreams. And yet that law is a natural law of the time-binding energies of man. What has been the trouble? What the main trouble has been is pretty plain. As already said, what we human beings do depends, not merely upon what we are but, in equal or greater measure, upon what we *think* we are. From time immemorial the characteristic energies of our humankind have been hampered by the false conception that man is a species of animal and hampered by the false conception that man is a miraculous mixture of natural and supernatural. Throughout the long period of our race's childhood, from which we have not yet emerged, those misconceptions have lain athwart the course of civilization. All that is precious in present civilization has been accomplished in spite of them. The goods, the glorious achievements, of which they have *deprived* the world, we can not now know but the subtle ramifications of their *positive* evil we can trace in a thousand ways. And it is your duty and mine to trace them. Whoever preforms the duty will be appalled. I can not dwell upon the matter here. Suffice it to say that, if we humans do not in fact constitute a perfectly natural class of life, then there never has been and never can be a human ethics having the understandability, the sanction and the authority of natural law; if we do constitute such a class of life but continue to *think* we do *not*, the result will be much the same—our ethics will continue

to carry the confusion and darkness produced by the presence in it of mythological elements. If, on the other hand, human beings continue to regard man as a species of animal, then the social life of the world in all its aspects will continue to reflect the misconception; especially our ethics, which subtly pervades, colors and fashions all of the social sciences, will continue to be—what it always has been in large measure—a zoological ethics, animal ethics, the ethics of tooth and claw, space-binding ethics, the ethics of strife, violence, combat and war.

So it has been, but it will not continue so to be if we have the wisdom to learn the fundamental lesson of our recent experience. What is that lesson? It is this: The World War was an unforeseen, sudden, cataclysmic demonstration of human ignorance of human nature—a demonstration, pitiless as fate or famine, that human beings have never rightly conceived Man to be what Man is—not a mixture of natural and supernatural nor a species of animal, but the natural agency for those time-binding energies in the world whose peculiar function it is to produce civilization and to do so in conformity with its marvelous law of an increasing function of time.

That conception will be found, I believe, to initiate a new epoch—the epoch of humanity's manhood. The concept is easy to grasp—all, and especially the young, can understand it. Once it is understood, human life will accord with human nature, the time-binding energies will be freed from the old bondage, and civilization will at length advance in accord with its natural Law as the great forward-leaping exponential function of Time. There will be great changes and many transfigurations. Education—education in home, school and church—will have for its supreme function to teach the children of man what man is and what they are. Ethics will abandon the space-binding standards of animals and will become *human* ethics based upon the natural laws of the time-binding energies of man. Freedom will be freedom to live in accord with those laws and righteousness will

be the quality of life that does not contravene them. The social sciences of ethics, education, economics, politics and government will become what they never have been—genuine sciences; fashioned by a just conception of man, they will cooperate to fashion the state; and the state, which may ultimately embrace the world, will rescue itself from ignorant politicians and commit its destiny to the guidance of *honest men who know*.

And when guided by honest men who know—when guided, that is, by the coming science of human engineering, which will be intelligence applied to human affairs—when thus guided in the light of the true conception of man as the binder of time—then and only then our human civilization—the living issue of time-binding toil, mainly that of the dead—will advance, not haltingly as hitherto, but, as said, in accord with the natural law thereof, in a warless world, swiftly and endlessly.

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MEDELIAN OR NON-MEDELIAN?

IN 1907, several years after the Mendelian discoveries had begun to attract general interest, a writer endeavored to limit "Mendelian heredity" to the occurrence of 3 to 1 phenotypic ratios. All other ratios were held to represent other systems of inheritance. This extreme view was not held by any one actually engaged at that time in genetical investigations, and the paper referred to was entirely ignored by geneticists because its author was so obviously ignorant of the real implications of the Mendelian discoveries.

Recently, two of our foremost geneticists¹ have gone to the opposite extreme in stating what should be included in Mendelian heredity, declaring that "Mendelian heredity has proved to be the heredity of sexual reproduction; the heredity of sexual reproduction is Mendelian." Certainly few geneticists would at the present time include so much under

¹ East, E. M., and Jones, D. F., "Inbreeding and Outbreeding." 285 pp. Philadelphia: J. B. Lippincott Co., 1919. See p. 50.

the term "Mendelian heredity," though one,² at least, there is, who sympathizes with this dictum.

Between these extreme views as to the meaning to be attached to the expression "Mendelian heredity" different geneticists have taken different positions and even one and the same writer has given the term different meanings at different times. These differences of usage have led to misunderstandings and to some controversy.

Davis³ has placed the mere occurrence of segregation in the *Oenothera* equivalent to Mendelian inheritance, thus accepting the validity of a criticism made by East⁴ based on the same conception as that quoted above from East and Jones, that all heredity in sexual reproduction is Mendelian. As I understand it, however, the occurrence or non-occurrence of segregation in the *Oenothera* has never been an important issue; the real question has been whether the segregation which does quite obviously occur is of the Mendelian type, *i.e.*, whether the hereditary factors are distributed during gametogenesis and fertilization according to the formulation actually developed by Mendel in interpreting the results of his experiments.

Other writers⁵ have grouped the phenomena of segregation under the terms "Mendelism" and "neo-Mendelism," but include under the latter name several phenomena which are now generally recognized among geneticists as differing in no essential way from the actual cases studied by Mendel. Still others speak of "orthodox" Mendelism, implying that there is also a "heterodox" Mendelism, or they use the expressions "strictly Mendelian,"

² Wright, S., "Systems of mating. I. The biometric relations between parent and offspring." *Genetics*, 6: 111-123. 1921. See p. 111.

³ Davis, B. M., "Hybrids of *Oenothera biennis* and *Oenothera franciscana* in the first and second generations," *Genetics*, 1: 197-251. 1916.

⁴ East, E. M., "The Mendelian notation as a description of physiological facts," *Amer. Nat.*, 46: 633-655. 1912.

⁵ Coulter, J. M., and Coulter, Merle C., "Plant Genetics." ix + 214 pp. Chicago: Univ. of Chicago Press. 1918. See pp. 40-96.