JOURNAL OF HYDROLOGY (N.Z.) Vol. 10, No. 2, 1971

A GENERAL SPATIAL MODEL
1 — Application to Efficient Land Use

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ABSTRACT

A new energy form is postulated from which a general model is synthesized. This general model uses the idea of hydrological efficiency constants to consider the question of efficient land use practice. The negentropy of water (the empirical measure of the efficiency of distribution of the usable energy of water) is referred to as a hydrological efficiency constant, and it is noted that the negentropy of water is a sensitive indicator of the stability of a given society in real terms.

INTRODUCTION

Recently there has been the slow realization dawning amongst some scientists that the time has come for unification and simplification of current knowledge and the synthesis of a general model from this to provide for an objective value frame of reference which quantifies the moral code.

This is an objective value frame of reference, which complements and completes existing relative value frames of reference derived from our materialist culture. A materialist culture is one based on the concept that the universe consists solely of matter, and it is here postulated that the universe also consists of the 'intrinsic energy form'.

In this paper the philosophical basis to a proposed synthesized general model, referred to as the model of the 'empirical science of values', which introduces the new postulated energy form, is briefly described. The model is then applied to the question of efficient land use practice and how this efficiency can be evaluated in empirical terms using the negentropy of water, which describes the efficiency of distribution of the usable energy of water (Sugawara, 1971), as an efficiency constant.

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PHILOSOPHICAL BASIS TO THE MODEL

The model of the empirical science of values is synthesized by the introduction of the concept of intrinsic energy into the concept of the universe, which is generally considered to consist solely of matter. This new concept is a unifying principle and can be identified with the idea of a synthesized *a priori* to knowledge* (Emmanuel Kant, 1781, quoted in Gerholm and Magnusson, 1967). For this reason it is better referred to as the 'intrinsic energy of the universe'†.

The intrinsic energy of the universe may be considered to be the non-mechanistic fundamental causality to the mechanistics of the material universe. It is the fundamental causality in the sense that the quantized energy, which derives from it, seeks through motion to approximate a state of continuous energy, or what is in effect paramount to approximating a state of inertia. In order that quantized energy may approximate a state of continuous energy it is necessary that work be done along a quantized energy gradient. In accordance with the Law of Conservation of Energy, the work input – which is regarded as a negentropy‡ process – must be compensated for by a corresponding work output, or entropy§ process. It is visualized that the compensating work output is derived from expansion. Coupling the work input and the compensating work output, in the terms described, we arrive at a physical system of

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* It provides the basis for simplification and the unification of all human knowledge into a general principle which contains and explains all other principles.

† This can be identified with the idea of an 'absolute space' (Isaac Newton, 1686, quoted in Gerholm, 1962), the idea of an 'aether' (James Clerk Maxwell, 1865, quoted in Gerholm, 1962) and the Ancients' idea of an infinitely divisible 'plenum'. However, to depart from classical materialist physics on this point, which presumed bodies to move in the absolute space or plenum and electromagnetic waves to proceed through the aether, the new physics supposes these phenomena to proceed *in a material space,* defined by the General Theory of Relativity (Albert Einstein, 1920, quoted in Gerholm, 1962), *because of the intrinsic energy of the universe.*

The difference between materialist physics and the new physics is subtle and has been overlooked until now because of the persistence of the view that the universe consists solely of matter.

The intrinsic energy of the universe can also be identified with the concept of Divine Mind (Eddy, 1875) or that property of the universe which scholars have traditionally ascribed to the Supreme Being (Henry Moore, 1671, quoted in Gerholm, 1962). On this basis the link between science and religion is forged in the new physics, as is the realization that we are dealing with a qualitative universe and not merely a quantitative one.

‡ As a measure of order in a statistical meaning.

§ As a measure of disorder in a statistical meaning.

localized zones of quantized energy approximating a state of continuous energy, which is exhibiting an overall expansion. This physical system identifies with the reality of an expanding material universe. In other words, the localized zones of quantized energy approximating a state of continuous energy are what we refer to as matter.

Associated with the negentropy process of quantized energy approximating a state of continuous energy along a quantized energy gradient, a very important new truth comes to light. This new discovery is what I refer to as the Law of Economy of Energy. The principle is that all naturally occurring processes in the material universe proceed with maximum efficiency. This universal principle may be compared to the principle of least action (Maupertuis, 1747, quoted in Lindsay and Margenau, 1957). In the process of quantized energy approximating a state of continuous energy along a quantized energy gradient, maximum efficiency is realized in terms of a symmetrical distribution of quantized energy in a non-euclidean or material space.

With this in mind we can now come to the question of the phenomenon of time. This is envisaged as arising from the mechanistic process of quantized energy approximating a state of continuous energy, in terms of probability, along a quantized energy gradient. In other words, time is first and foremost a probabilistic function and is generated through motion.

This new world view in which processes occur in a non-euclidean space and in which time is generated from this is contrary to existing materialist conceptual models which usually assume that processes occur through time.

From the fundamental philosophical concepts so far discussed I have formalized four axiomatic laws to the empirical science of values. These laws govern the mechanistic processes of the material universe, and are as follows:

(1) The Law of Conservation of Energy as applied in thermodynamics.

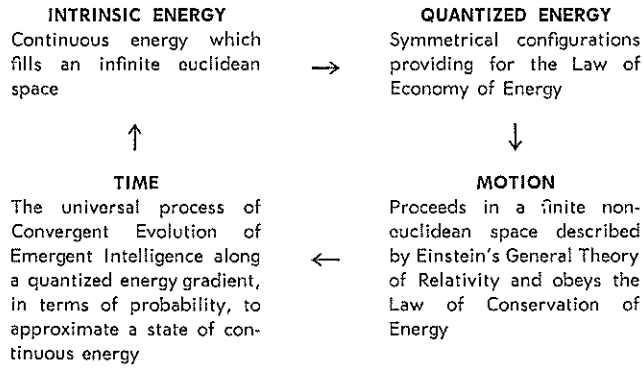
(2) The Law of Convergent Evolution of Emergent Intelligence, which describes the process involving symmetrical configurations of quantized energy in non-euclidean space seeking through motion to approximate a state of continuous energy, in terms of probability, along a quantized energy gradient.

(3) The Law of Economy of Energy, which is realized in terms of a symmetrical distribution of quantized energy in non-euclidean space, since this provides for the most efficient con-

figuration by which quantized energy is able to approximate a state of continuous energy.

(4) The phenomenon of time is a probabilistic function generated through motion.

These axioms to the empirical science of values can be depicted diagrammatically as follows:



The model of the empirical science of values, although presented only in diagrammatic form in this introductory paper, can also be described in mathematical terms by what I refer to as the fundamental universal relativistic qualitative equation. This synthesized general equation is the qualitative counterpart to the mathematical equation formulated in the General Theory of Relativity by Einstein. The latter is entirely mechanistic and devoid of any metaphysical content (Gerholm, 1962).

The new relativistic qualitative equation effectively integrates all mathematical models describing processes through time by defining them as a general process occurring in non-euclidean space.

APPLICATION OF THE MODEL TO EFFICIENT LAND USE PRACTICE

It is a well established fact that the socio-economic structure and function of society is reflected in its land use practice. Furthermore, it has also been shown that the land use practice of a society is reflected in terms of the hydrological system associated with it. Bearing in mind this relationship between the socio-economic structure and function of society, through land use practice, to the hydrological system, and referring to the model of the empirical science of values as outlined, we can now formulate the general socio-economic-hydrological land use model.

This synthesized general model describes the socio-economic structure and function of society in terms of hydrological efficiency (or stability) constants, where the efficiency constants define the extent to which the Law of Economy of Energy is being observed in the hydrological system.

Since the efficiency of hydrological processes can be measured directly in terms of the distribution of the usable energy of water (Sugawara, 1971), it can be seen that the negentropy of water is in turn an empirical measure of the efficiency of the hydrological system as it reflects land use practice, and hence a measure of the structural-functional efficiency of a given socio-economic model of society as it represents the real world. This means that the negentropy of water is an empirical measure of the socio-economic stability of a given society in real terms. A society generating low-negentropy water would thereby be classified as an inefficient society, and would consequently be socially and economically unstable.

The negentropy of water is an ideal empirical measure of socio-economic land use efficiency, since it can be substantiated that it is an extremely sensitive index and that this sensitivity operates over a wide range scale in the sense that water embraces virtually all human activity within the socio-economic context.

CONCLUSION

From the model of the empirical science of values it is possible to establish that we are dealing with a material universe which functions according to the Law of Economy of Energy. This law states that all naturally occurring processes in the material universe proceed with maximum efficiency in terms of symmetry. Processes of this kind are said to be *ideal*, and can be defined by *real* efficiency constants.

A useful efficiency constant is the negentropy of water, which defines in empirical terms the efficiency of a hydrological process. Since this process embraces the socio-economic structure and function of society, through land use, the negentropy of water is a very precise way of establishing the stability of a given society in real terms.

ACKNOWLEDGMENT

I wish to thank Mr C. Toebes, Chief Scientific Hydrologist, Ministry of Works, Wellington, for his useful and constructive criticism.

Permission to publish this paper was given by the Commissioner of Works.

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