

**Jan DORDA SJ, *Studium o przyczynowości sprawczej z zastosowaniem w kosmologii i w teodycei*** [A Study of Efficient Causality as Applied to Cosmology and Theodicy]. Kraków: Ignatianum – WAM, 2001, pp. 395.

This Dorda's *opus vitae* was ready for publication in 1970 but it contains many cogent arguments and observations. Although in many instances new advancements have been made in physics and mathematics, Dorda's basic statements and observations on causality are still relevant and interesting today.

Dorda's treatise comprises an Introduction and four parts. In it he considers the following questions:

1. Does causality apply only to human activity, or does it also extend into the remaining beings, including the inorganic world?
2. The difference between the generic and specific determination of the impact of various causes on the emergence, existence, and quality of an effect.
3. To whom or what should the designation „cause” be ascribed? To things (in other words to substances), or to events (in other words to processes)?
4. The definition of causal influence. Does causal influence belong to the irreversible and transitive relations? Is it connected with change, that is with the originating or emergence of beings that are either new or modified?
5. The relation between causal influence and the principle of sufficient reason: do these concepts overlap or not?
6. Another problem of definition concerns the identification of an effect on the basis of its structure.

In Part I, which presents some 20<sup>th</sup>-century authors' views on causality, Jan Dorda discusses the efforts and achievements of 10 20<sup>th</sup>-century authors (J. Geysler, T. de Régnon, M. Jaworski, M. A. Krapiec, F. Sawicki, J. Metallmann, J. Łukasiewicz, W. M. Kozłowski, S. Kobyłecki, and H. Greniewski) on the subject of causality. These authors studied causality either independently, or in connection with the Aristotelian and scholastic tradition.

In Part II, on the methodological and epistemological assumptions for the study of causality, Chapter 1 (on the multi-layered nature of reality), Dorda takes a critical attitude to the one-sidedness of Scientism, Logicism, Neo-Positivism, which in various ways limit both man's ability to make contact with reality, and his image of reality, which is many-sided, multi-layered, and has many aspects.

In Chapter 2, in which he explains the concepts of potency and act and describes their dual origin, Dorda observes that these two concepts are analogical in character. Dorda reinterprets the Aristotelian concepts of form and matter. For him the laws of physics correspond to Aristotle's concept of form. Potency is parallel to the set, and an act to an element from the set. By means of this approach, Dorda defines modal concepts such as possibility, actuality, contingency, and necessity. In this context he defines the working of an efficient cause as „a particularisation of general parameters and whichever constants,

which for physical processes we generally refer to by the expression «to select initial values.»”

He shows that forces may not be treated as causes, since they are passive and are subject to change only when movement is introduced into a network of bodies.

In Part III, an outline of the theory of efficient causality, Dorda reaches the heart of the matter. In Chapter 1, on the experiential foundations of the concept of causality, he endeavours to show, contrary to Hume's claim, that there exists a real influence of cause on effect. He starts from the inner experience of the influence of the willing self, especially as exerted in our body movements, on the development of culture. On the other hand the experience of passive reception provides the grounds for the ascription of causality to external objects.

In Chapter 2, on the multiplicity of formulations of the principle of causality, Jan Dorda enumerates 7 different formulations encountered in the Scholastic textbooks. He does not query them. He tries only to contemporize. Thanks to this explanation of the concepts of sense and structure it will be possible to define causal influence by the structural analogy between influence and an act of decision, that is the choice of one element from a set of several possible elements. Dorda performs this task in Chapter 4, which deals with potentiality as a set, and the act as an element from the set.

Chapter 3 presents an introduction to the definition of the causal relation by means of abstraction, and in it the concepts of sense and structure are applied. Since they are primary concepts, Dorda introduces them by means of examples. Thus the sense of colours or of sounds is a direct item of information from the respective senses, while their structure is a wave; the structure of the formulae for the electrostatic, gravitational, and magnetic forces is similar, but their sense is different – mass, electric charge, and magnetic quantity respectively.

Dorda uses van der Waals' equation of state for perfect gases to illustrate his suggested definition of causal influence. The three variable parameters, pressure, volume, and temperature, represent three sets of specific numerical values, which determine the gas' potentiality in a threefold range of specific values. Each specific value, an element of a particular set, is one of the possible acts of pressure, volume, or temperature. Finally, applying the concepts under discussion, he describes causal influence as the attribution of a specific value to general independent variables.

In Chapter 5, on the axioms of efficient causality, Dorda presents the four Scholastic axioms, *Ab esse ad posse valet illatio*, *A non posse ad non esse valet illatio*, and *A posse ad esse non valet illatio*. *A non esse ad non posse non valet illatio*, in a new garb. They are remodelled as follows:

1. If a subject is ascribed to an element, then it is ascribed to the set to which the element belongs;
2. If a subject is not ascribed to a set, then it is not ascribed to any element of the set;
3. If a subject is ascribed to a non-unitary set, it need not thereby be ascribed to any of the elements in the set.
4. If a subject is not ascribed to an element, it need not be ascribable to the set.

Dorda adds 5 of his own axioms to the above three, and does not rule out the existence of further axioms.

In Chapter 6, an attempt to describe the axioms of causality by means of a calculus of propositional variables, Dorda endeavours to construct a formal theory of causality. First he formalises the axioms he has already listed. Next, by applying the implication functor, he gives the following definition of cause: „By cause P we mean something which ascribes one element of a non-unitary set to a subject S, thereby causing the absence of ascription to S of the remaining elements of the set.” Finally he formalises Axiom VIII, in other words his principle of causality.

In Chapter 7, on the reduction of the formulae for the principle of causality presented in Chapter 2 to the formulation of Axiom VIII, he reinterprets the textbook formulations he has already described, applying his own new terminology.

In Chapter 8, a search for a new scheme of action, he analyses various acts of making expressed by verbs such as *to create*, *to put together* and *to take apart*, *to cause*, *to form* or *transform*, *to change*, *to arrange* or *order*, *to adapt* etc.

Chapter 9, on prospects for the further development of the theory of influence, concludes Part III.

Part IV deals with applications in the field of cosmology and theodicy, and presents a collection of suggested applications in natural philosophy and in arguments for the existence of God, of the theory described in Part III.

Chapter 1 is concerned with a definition of motion as a change of position. He puts forward the following definitions: a body which is at rest is ascribed to a point. A body which is in motion is ascribed to a line.

In Chapter 2, on the trueness of the „principle of motion,” *quidquid movetur, ab alio motum accipit* – Dorda limits his account to an analysis of local motion. He endeavours to show that even constant motion must have a cause. The expression „a motion is determined” means that the following aspects of the motion are numerically determined: 1) the masses in the system, 2) their relative accelerations, 3) their initial positions, and 4) their initial velocities. Even if the masses and accelerations are fixed, this is still not sufficient to determine the motion until we select particular values for initial positions and velocities, which have to be specified out of an infinite number of possibilities. It is the efficient cause that determines this selection.

In Chapter 3 Dorda poses the question whether the law of conservation of energy (and mass) confirms the indestructibility and uncreatability of these quantities. His answer – contrary to the claims of many Marxists – is that it is possible for mass and energy to disappear and reappear.

In Chapter 4, on the conditions for valid proofs for the existence of God, which are not easy to fulfil, and examples of the difficulties involved, the author turns to problems in theodicy. Arguments for the existence of God have the nature of reductive reasoning; they start from facts which cannot be explained by causes within the world, and proceed to the notion of God as the prime cause.

The Chapter 5 discusses miracles which suspend the principal laws of nature as a reductive argument. Dorda presents two types of argumentation here. The first involves phenomena which are contrary to the law of conservation of mass

and energy. The second type involves the facts that exceed the laws of nature because of the speed at which a process takes place and its complexity.

In Chapter 6, on the next reductive arguments, the author discusses 1) the appearance of life, 2) the emergence of sensory consciousness, 3) and the emergence of human thought, which do not lie exclusively in the range of causes within the world. He criticises claims put forward in the theory of evolution. First he observes that the claim that life started by means of random occurrence is untenable, since the probability of such an event is negligible. Autogenesis, says Dorda, would be self-contradictory, since the component parts of a living organism are only stable if they are part of an already complete organism. Moreover the emergence of life would require the direction and control of the process of synthesis. But the physical forces and chemical properties of atoms become less and less able to undergo unambiguous syntheses if they are not controlled or steered for the achievement of a definite purpose – the synthesis and organisation of an organism, the greater the range of possible unfavourable syntheses proceeding from the same starting material.

The self-emergence of a thinking being is all the more inexplicable in terms of the forces of nature alone, since mind cannot be reduced to a material machine, because thinking cannot be reduced to an ultimate formalisation. This is the outcome of Gödel's limitation rules.

In Chapter 7 Dorda passes to anthropology and considers the ethical and eudemonistic argument. First he observes the universal occurrence of the sense of duty in human beings, which defies explanation either by social pressure or by man's hereditary hedonistic archetypes.

Likewise the desire to attain the absolute good, in other words perfect happiness, which cannot be achieved in this world, testifies to the existence of God, who put such a desire in man.

Chapter 8 presents an outline of the teleological proof as based on animal instinct, with reference to research results obtained by entomologists (Fabre). The instinctive behaviour of insects is so sophisticated that it can hardly be explained as an outcome of processes of natural selection.

Chapter 9, the last in this part of the book, is a critique of the criticism of the entropological proof. Dorda presents the argument based on increasing entropy, defending its legitimacy against counter-arguments. He refutes the following arguments against this reasoning: 1) the inadmissibility of extrapolation of this law for the whole cosmos, 2) the statistical character of the second law of thermodynamics, 3) the possibilities of regeneration inherent in the world through a) undiscovered and unexploited sources of energy, b) the oscillatory process of expanding and shrinking universe, 4) Poincaré's phase theorem and the eternal return of worlds, 5) the differences between relativistic thermodynamics and classical thermodynamics according to Tolman.

Chapter 10, the final chapter, deals with changes and their causes, the contingent nature of changeable and dependent things, and arguments for the existence of a Prime Cause on the grounds of contingency and causality.

The first form of the proof is as follows: we start with the distinction between acting and not acting energy. The former is the energy which the system retains; the latter is the energy which passes to another system. The dividing

line between these two forms of energy is not fixed. How did this division arise? The answer to the question about its origins is that there must have been a Cause which of all the possibilities chose this particular one.

The second form of the proof is as follows: mass is a property constituting a general parameter which may be particularised in various numerical values. If we assume that the rest masses of different types of elementary particles mark the minimum boundary of their energy, then patently the efficient causality in their kinetic energy has a lower limit which is determined in an unexplained way if we assume the hypothesis of the range of energy being infinite. On the hypothesis of a finite mass and energy in the universe, the very fact of the existence of a particular finite total mass is fully arbitrary, and as such requires a cause existing outside the universe.

The third form of the proof is based on the logical derivation of the laws of mechanics from the principle of minimum action. Kinetic energy is a necessary condition of efficient causality, but it is not a sufficient condition. This is so because the function of action is a general parameter, open to various particular values, one of which is the minimum value. Therefore there must exist a Prime Cause beyond the universe to particularise that parameter by selecting its minimum value.

Dorda's treatise has no summing up and no synthesis of his results. Presumably he considered the application of his ideas to the arguments for the existence of God a conclusion to the book. The indexes of persons and of more significant terms facilitate the lecture of the *Study*.

Stanisław ZIEMIAŃSKI SJ

**Ládislav BORECKÝ, *Veda v nás a okolo nás. Úvahy o vede, človeku a spoločnosti*** [Nauka w nas i wokół nas] Bratislava 1997, ss. 132.

Nie ulega wątpliwości, że jak na książkę filozoficzną praca L. Boreckiego jest pozycją nietypową i zarazem wyjątkową. Jej nietypowość wynika przede wszystkim z faktu, że autor nie jest zawodowym filozofem, a jego filozoficzne zainteresowania wynikają z problemów, na które natknął się w dziedzinach nie związanych z filozofią. Mamy tutaj do czynienia z książką „filozofującego lekarza”, tak osobę autora określa się we *Wstępie*. Tego rodzaju prac pojawia się dość sporo. Wiele z nich – właśnie dzięki swemu potocznemu, pozbawionemu specjalistycznych wyrażań językowi – zdobywa popularność, jednakże stosunkowo nieliczne mają rzeczywistą wartość poznawczą, która nie polega wyłącznie na dostarczeniu czytelnikowi porcji przyciągających uwagę ciekawostek i kontrowersyjnych interpretacji, lecz jest odkrywczą z punktu widzenia filozofii.

Wyjątkowość książki L. Boreckiego wynika m. in. z tego, że autor nie usiłuje snuć filozoficznych refleksji nad własną dyscypliną, lecz zajmuje się problemami, które z medycyną – poza nielicznymi wyjątkami – niewiele mają wspólnego. Zdarzają się wprawdzie przypadki filozofujących biologów (jak choćby Driesch, po którym w filozofii biologii zapanowała trwająca do dziś stagnacja),