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## THE VITALITY OF THE COVERING LAW MODEL Considerations on Wright and Mackie

SECTION I – *The Italian and the American covering law models.* – 1. *Unsuccessful attempts to falsify the essence of the covering law model.* – 2. *The vitality of the model tested: its discovery by American civil law doctrine (WRIGHT).* – 3. *The imperfection of our knowledge: the tacit assumptions in the Italian model and in the American model of the instantiation of the causal law.* – 4. *The non causal concept of probabilistic causation and its failure to substitute the Italian and American covering law models.* – 5. *The explanatory function of the model and the failure of naked statistics to have explanatory power.* – 6. *The distinction between ex ante and ex post probability in the American model and its utility for the Italian model.* – 7. *Ex ante probabilities and lost chances in medical-surgical activity.* – 8. *Summing up.* – SECTION II – *MACKIE’s INUS condition and WRIGHT’s NESS test; the impossibility of substituting the sine qua non condition and the but for test.* – 1. *The INUS condition.* – 2. *The NESS test: the analogy with the concept of cause proper to the natural sciences proposed by ENGISCH.* – 3. *The impossibility to use the NESS test as well as the concept of cause “proper to the natural sciences”.* – 4. *The contingently necessary condition in the context of a sufficient condition.* – SECTION III – *The superfluous nature of the NESS test and the INUS condition for the criminal law.* – 1. *The description of the event.* – 2. *The description of the event in the thought of WRIGHT and MACKIE.* – 3. *The European literature on the description of the event.* – 4. *The event as the result described by the law, which occurs hic et nunc, and preemptive causation.* – 5. *The event, as a result described by the law, which occurs hic et nunc, and duplicative causation.* – 6. *Duplicative causation; the expedients sometimes used by judges to violate the legality-mandatory principle.* – 7. *A possible residual use of the NESS test.* – 8. *Final considerations.*

### SECTION I

#### *The Italian and the American covering law models.*

1. *Unsuccessful attempts to falsify the essence of the covering law model.* – Clumsy attempts have been made nowadays by both Italian legal doctrine and official jurisprudence in order to falsify the essence of the concept of causation in criminal law. The most commonly adopted theory based on the identification of the criminally relevant cause with the necessary condition for the harmful event and on the covering law model is under attack<sup>1</sup>.

In two previous essays I believe I have demonstrated that both the covering law model and the notion of the necessary condition have brilliantly rejected those attempts; the arguments with which the model was attacked turned out to be a striking series of logical fallacies<sup>2</sup> or even the expression of a veritable allergy to proofs<sup>3</sup>.

However, the mere fact that some scholars and judges have tried, unsuccessfully, to falsify the essence of a concept which had been universally accepted, makes me check whether the thesis I have always upheld has been confirmed by the latest developments in the debate.

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<sup>1</sup> In the most recent doctrine, cf. *inter alia*, as an outstanding exponent of the judiciary which has attempted in vain to falsify the essence of the model, BRUSCO, *La causalità giuridica nella più recente giurisprudenza della Corte di Cassazione*, in *Cass. Pen.*, 2004, p. 2599 et seq. (“In order to be able to say that the conduct of a subject was the cause of an event, the existence of a scientific law which demonstrates it is not indispensable” – p. 2612 et seq.; the procedure of mentally eliminating the single antecedents and therefore the identification of the *sine qua non* condition is claimed not to be decisive and hence is to be substituted by verifying that “a subject’s conduct may be efficiently inserted in a causal process” and “contributed” to the production of the harmful event in accordance with the laws on plurality of causes – p. 2602 et seq.). Brusco, in a scientific paper, illustrates the points of view he already expressed in delivering numerous opinions of the 4<sup>th</sup> Section of the *Supreme Court of Cassazione*. The Orlando sentence of 10.6.2002, the Loi sentence of 15.10.2002, the Ubbiali sentence of 5.12.2003 and the Macola sentence of 11.7.2002 deserve particular mention. These sentences have been subjected to critical examination in my two essays *Fallacie e anarchia metodologica in tema di causalità*, in *Riv. it. dir. proc. pen.*, 2004, p. 23 et seq., and *L’allergia alle prove della causalità individuale*, in *Riv. it. dir. proc. pen.*, 2004, p. 379 et seq.

<sup>2</sup> Cf. F. STELLA, *Fallacie e anarchia metodologica in tema di causalità*, op. cit., p. 28 et seq.

<sup>3</sup> Cf. F. STELLA, *L’allergia alle prove della causalità individuale*, op. cit., p. 379 et seq.

To do so, I shall now compare my thought with that of the American legal scholar RICHARD W. WRIGHT and with the “updating” of the philosophical thought on the matter made by the British philosopher JOHN L. MACKIE.

2. *The vitality of the model tested: its discovery by American civil law doctrine (WRIGHT)*. – The history of juridical science could offer several examples of doctrinal formulations which are identical in their contents, but which were developed independently, each unaware of the other, by two scholars living in different continents. To these examples we can now add that concerning the causal explanation model generally known as “covering law model”.

In 1975, following a long-forgotten 1931 formulation by ENGISCH, I identified in this model the only objective – because subtracted from any discretionary evaluation – parameter available to the judge with which to justify single causal pronouncements. That is to say, the only way to explain the reasons for which an antecedent can be defined as the necessary condition for the harmful event. Some years later these reflections of mine penetrated Italian penal jurisprudence; in 1990 the sentence on the Stava disaster adopted the covering law model in the whole. This opinion of the Supreme Court was to be followed, up until the early 2000s, by a myriad of sentences delivered both by the lower Courts and the Supreme Court of Cassazione<sup>4</sup>.

In a lapse of time so brief as to be almost contemporaneous, a professor of the University of Chicago, RICHARD W. WRIGHT, began, in the 1980s, his studies in causation which were to lead, in 1988, to his fundamental “Bramble Bush” essay<sup>5</sup>. Though unaware of my thought – and presumably without having ever heard of KARL ENGISCH – WRIGHT reached the same conclusions as me, giving birth to an “instantiation of the causal law” model substantially identical (except for a few small points which I will mention later) to the covering law model. WRIGHT’s ideas, too, have deeply penetrated the American case law of civil Courts.

Rejecting the pre-Humean idea that objects and events possess qualities and forces which can explain the causal relationship, WRIGHT affirms that single causal judgments can only be based on the **regularity** observed in the succession of events, which assumes the form of an universal causal law<sup>6</sup>. A causal law, in WRIGHT’s opinion, describes an invariable, not probabilistic, causal relationship between certain fully specified sets of antecedent conditions and a certain result: every time the listed conditions appear together, the result inevitably occurs. If the **types** of conditions and events described by the causal law as **abstract** types are instantiated in the single case, particularistic proof will have been provided of the existence of the causal relation between the actual antecedent and the actual result under consideration.

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<sup>4</sup> Cass. pen., sez. IV, 6.12.1990, imp. Sonetti, in *Foro it.*, 1992, II, p. 36 et seq. and *Cass. pen.* 1992, p. 2726; Cass. pen., sez. IV, 27.5.1993, imp. Rech, in *Cass. pen.* 1995, p. 2898 et seq.; Cass. pen., sez. IV, 7.12.1993, imp. Lanieri, in *Riv. pen. ec.*, 1996, I, p. 56 et seq.; Cass. pen., sez. IV, 28.2.1995, imp. Colonnelli, unpublished; Cass. pen., sez. IV, 8.3.1995, imp. Prosperini, unpublished; Cass. pen., sez. IV, 4.2.1997, imp. Zucchi, unpublished; Cass. pen., sez. IV, 26.1.1998, imp. Viviani, in *CED* 211847; Cas. pen., sez. IV, 27.11.1998, imp. Paoli, unpublished; Cass. pen., sez. IV, 11.1.1999, imp. Traballi, unpublished; Cass. pen., sez. IV, 20.1.1999, imp. Hauptmann, unpublished; Cass. pen., sez. IV, 5.2.1999, imp. Fanti, *Arch. giur. circ.sin. strad.*, 1999, 11, p.890 et seq.; Cass. pen., sez. IV, 28.9.2000, n. 1688, imp. Baltrocchi, in *Riv. it. dir. proc. pen.*, 2001, p. 207 et seq., with note by Cetonze; Cass. pen., sez. IV, 25.9.2001-16.1.2002, n. 1585, imp. Sgarbi, in *Riv. it. dir. Proc. Pen.*, 2002, p. 737 with note by D’Alessandro; Cass. pen., sez. IV, 25.9.2001-13.2.2002, n. 1652, imp. Covilli, in *Riv. it. dir. proc. pen.*, 2002, p. 737 with note by D’Alessandro.

<sup>5</sup> R. W. WRIGHT, *Causation, Responsibility, Risk, Probability, Naked Statistics and Proof: Pruning the Bramble Bush by Clarifying the Concepts*, in 73 *Iowa L. Rev.*, 1988, p. 1002 et seq. The previous essays by R. W. WRIGHT are *Causation in Tort Law*, in 73 *Cal. L. Rev.*, 1985, p. 1735 et seq.; *Actual Causation vs. Probabilistic Linkage: The Bane of Economic Analysis*, in 14 *J. Legal Stud.*, 1985, p. 435 et seq. and *The Efficiency Theory of Causation and Responsibility: Unscientific Formalism and False Semantics*, in 63 *Chi.-Kent L. Rev.*, 1987, p. 553 et seq. Subsequently to 1988, ved. *The Logic and Fairness of Joint and Several Liability*, in 23 *Mem. St. U. L. Rev.*, 1995, p. 45 et seq., and, especially, *Once More into the Bramale Bush: Duty, Causal Contribution, and the Extent of Legal Responsibility*, in 54 *Vand. L. Rev.*, 2001, p. 1072 et seq.

<sup>6</sup> WRIGHT, op. cit., p. 1018 et seq.

Thus far, the coincidence between my theses and those of WRIGHT is truly striking; coverage by general and abstract laws means none other than the instantiation of the causal law and therefore the provision of **particularistic** proof of the causal relationship in the single case.

The coincidence, as can be seen, is absolute, even if a few divergences in details are to be noted. In 1975 I affirmed that the scientific laws we can use are obviously causal laws, that is universal-type laws which assert the invariable nature of the succession of certain types of events. I had, however, also declared that those statistical laws which guarantee an “almost certain” or “practically certain” explanation of the single event could be used<sup>7</sup>. By these statements, which I developed and illustrated in *Giustizia e Modernità*<sup>8</sup>, I meant that statistical laws can play a role similar to causal laws on the condition that they guarantee the explanation of the event with overwhelming probability. I referred to statistical laws such as the second law of thermo-dynamics, or the laws mentioned by HEMPEL on radioactive decay in polonium or GRAHAM’s law on the diffusion of gases; they are all laws based on the observation of a frequency of events which is close to 1 and therefore close to the universality of the causal laws.

On this point WRIGHT is more definite than me.

Non-deterministic processes – WRIGHT says – do not exist; truly non-deterministic laws are unintelligible and mysterious; those who believe that the notion of deterministic causation collapsed after the announcement of HEISENBERG’s uncertainty principle in 1927 are wrong; equally wrong are those who believe that a further collapse took place with the introduction of functional equations into science; the error of the former lies in the fact that the uncertainty principle represents a description of nature which could lead to problems in the hypothesis that juridical questions were to arise concerning subatomic particles, but creates no problems for the actual cases with which justice is concerned. The error of the latter lies in the fact that functional equations are none other than enunciations of mathematically quantified causal laws or generalizations (“usually expressed through time-based derivatives of the regularities of succession that constitute ordinary causal generalizations”<sup>9</sup>).

Support for WRIGHT has come from the philosopher MACKIE. Various apparently non-deterministic processes reveal, when examined more closely, their deterministic nature; the difficulties encountered in attempting to describe truly non-deterministic “statistical laws of functioning” strengthen our doubts as to their existence. Laws of this type would seem to require an intrinsic **propensity** on every single occasion that the antecedent conditions take place, but this propensity can be denied with the same arguments as were used by HUME to deny the existence of objective causal “forces” in deterministic processes. There is no evident means of explaining, without calling upon deterministic laws, why an actual set of antecedent conditions approaches or should approach a frequency-limit; in the last analysis only deterministic laws could have real explanatory power<sup>10</sup>.

I do certainly agree with these observations: the existence of statistical laws possessed of explanatory power is debatable to say the least. And all the more debatable if we consider that the explanatory power of the deterministic laws is linked by philosophical thought to the intuitive idea of **necessity**. As AGAZZI observes, the idea of necessity was revalued, after HUME’s analysis, by KANT, and the neo-empiricists have “shifted” it onto the requisite of the universality of the causal laws. The requirement that among the premises of the *explanans* of the deductive-nomological model there are to be found some universal laws is based on the assumption that such universality is the expression of a necessity of some kind<sup>11</sup>.

<sup>7</sup> Cf. F. STELLA, *Leggi scientifiche e spiegazione causale nel diritto penale*, Milan, 2nd ed., 2000, p. 311 et seq.

<sup>8</sup> Cf. F. STELLA, *Giustizia e modernità*, Milan, 3rd ed., 2003, p. 142 et seq.

<sup>9</sup> Ved. R. W. WRIGHT, *Causation, Responsibility, Risk, Probability*, cit., p. 1029, note 145.

<sup>10</sup> J.L. MACKIE, *The Cement of the Universe: A Study of Causation*, Oxford, 1980, chap. 2 p. 54 et seq., chap. 3 p. 76 et seq., chap. 8 p. 193 et seq., chap. 9 p. 240 et seq. Cf. also WILLIAMS, *The Mathematics of Proof*, in *Crim. L. Rev.*, 1979, p. 297-298.

<sup>11</sup> Cf. E. AGAZZI, *La spiegazione causale di eventi individuali (o singoli)*, in *Riv. it. dir. proc. pen.*, 1999, p. 393 et seq. The debate on the “necessity” of the causal relationship continued to engage philosophers during the last century: see,

In order to explain my thought better, I would like to retrace the steps of the history of the philosophy of the concept of cause, using AGAZZI's reflections for this purpose.

Precious little remains in modern natural science of ARISTOTLE's famous distinction between the four causes (material, formal, efficient and final). The target of this science has been above all the formal cause. In classical philosophical language, in fact, form means the **essence** of an object, and a knowledge of this essence permits the **necessary** deduction of the means of being of that given object. Taking its cue from GALILEO's explicit decision not to undertake, in the case of natural reality, the desperate attempt to grasp preliminarily the essence of things, modern natural science contented itself, in the beginning, with describing and understanding certain features of things which were empirically observable and translatable into mathematical language.

The rejection of the essentialist point of view raised the difficult problem of how to justify the aspect of **necessity** which is inherent to the **intuitive** use of the concept of cause. A useful reference point for the resolution of this problem was LEIBNIZ's reformulation of the principle of causation; nothing happens without a reason. In order to find the reasons, we must be able to answer the question "**why**" a certain event took place, or we must be able to say: "if this or that happens ... then a certain consequence derives logically from it" (which is to say, what was observed or that for which we sought the reason).

LEIBNIZ's analysis was still too generalized, however, since it did not indicate **how** we can recognize the effective reasons and/or causes. After LEIBNIZ came KANT: according to the well-known teachings of the great philosopher, it is **absolutely necessary** for a certain empirically observable effect to have a cause and, for this reason, if we express a causal relationship between two events, this must have been understood as **necessary**. In this way HUME's point of view, which reduced causation to a simple observation of reality, is superseded. If we affirm that there exists a cause-effect relation between two events, this must be understood obligatorily as a **necessary** relation<sup>12</sup>.

The 20<sup>th</sup> Century changed very soon its ways of considering science, especially on that part of the thought movement which intended to attribute science with the highest level of dignity in the context of human knowledge: neo-positivism, also called logical positivism or logical empiricism. There re-emerged strongly - particularly through the work of such writers as CARNAP and HEMPEL - the theme of the **scientific explanation**, which returned to the perspectives previously outlined by ARISTOTLE and LEIBNIZ.

According to the neo-empiricism, the explanation of a single event consists of a **logical deduction**, among the premises for which are to be found at least one **universal** or covering law and a certain number of factual premises (*explanans*), from which the *explanandum* is logically deducible.

This is the so-called deductive-nomological model of the scientific explanation.

On this basis, contemporary epistemology has attempted a notable recovery of the notion of causation through the identification of the **causal explanation** with the deductive-nomological explanation. This recovery has two peculiarities: on the one hand, the causal relation is understood as a regularity, without claiming to attribute causation to essential properties inherent to the objects observed; on the other hand, it is accepted that causation must also add to regularity the feature of

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among others, the contribution by L. ANSCOMBE, *Causality and Determination*, Cambridge, 1971, p. 88, who, while not denying that necessity must be a feature of any adequate analysis of causation, specifies that the necessity will be that of the natural laws; through it we will be able to describe an awareness of the effect of the awareness of the cause, or vice versa, but this does not show that the cause was the source of the effect. Causation, therefore, must not be identified with necessitation. A smaller part of the 20<sup>th</sup> Century contribution to the discussion of the concept of cause is based on the idea that the analysis of the causal connection cannot be confined within a world governed by deterministic laws; philosophers such as REICHENBACH, *The Direction of Time*, Berkeley, 1956, and SUPPES, *A Probabilistic Theory of Causality*, Amsterdam, 1970, have proposed probabilistic theories of causation, affirming that the concept of probability is an essential ingredient of any analysis of causality. For further references, cf. also LAUDISA, *Causalità*, Florence, 1999, p. 94 et seq.

<sup>12</sup> For a recent analysis of Kant's thought, under the required profile, ved. LAUDISA, *op. cit.*, p. 61 et seq.

necessity. And in fact, the request that **universal** laws figure among the premises is based precisely on the assumption that this universality is the expression of **some kind of necessity**.

The role of necessity is thus entirely shifted onto the requirement of universality.

The deductive-nomological translation of the causal relation has raised several doubts (if a necessity which is held to be included in a natural law is not identifiable with a logical necessity, whatever kind of necessity is it?). However, while remaining aware of these doubts and limits, AGAZZI observes that “the adoption of the deductive-nomological model still constitutes the most suitable instrument, or the least unsuitable, for the identification of a cause of an individual, or single, event”<sup>13</sup>.

Basic difficulties, with regard to the neo-empiricist vision of the causal relation, emerge from the epistemology of POPPER. For POPPER, natural laws with that value of necessity with which the empiricists attribute them do not exist.. According to POPPER’s perspective, all laws are **conjectures** which stand up until an empiric event is found which contradicts them: it is quite true that, again according to POPPER, the scientific explanation adopts the structure of the deductive-nomological process, but this explanation is entirely provisional and refutable in principle. It is plain, then, that if we wish to use this model for causal imputation, we find that the very character of necessity of the laws on which it is based vanishes into nothing.

Indeed, the defenders of the deductive-nomological neo-empiricist model of the explanation had already realized that difficulties created by the presence, also in the physical sciences, of laws that were not rigorously universal but merely expressed higher or lower **probabilities** that , given a type A event, a type B event would follow. The law contained in the *explanans* has a probabilistic character, in the sense that it demonstrates a certain statistical regularity of a **frequency** type between the occurrence of a type A event and a type B event: what meaning does it have, then, if we assert that this law, together with the initial conditions, does not imply event E **necessarily**, but only with a **certain degree of probability**? Evidently, this is **another type of probability**, sometimes called logical probability, which is substantially equal to a **degree of expectation** or a **degree of trust** that E will take place.

Here we can see, however, how the application of the statistical explanation to the research for the causes of a single event is very **problematical**. In fact, “it is only by a sort of extension of the language that we speak, from the point of view of frequency, of the probability of the single event; it is a manner of speech which implies the following: if we make an adequate number of trials, the event should take place with frequency  $q$ . The fact is, however, that when we cannot subject the event to a series of trials, because it is a single event, we are not able to attribute it, as a cause, with the causation foreseen by the statistical law, except with a **degree of trust** proportionate to the probabilities inherent in the covering law”. This is why the authors who adopt the deductive-nomological model (CARNAP, HEMPEL, POPPER, NAGEL, BRAITHWAITE, AGAZZI) agree in demanding that the frequency probability expressed in the covering law should be very **close to 1**, which is to say, to certainty.

AGAZZI concludes: this is not simply a cautionary measure, but rather it derives from the fact that we can speak of causation only in the presence of a **necessary link**; making this necessity coincide with universality is in itself not without problems, but **at least** that should be guaranteed<sup>14</sup>.

We can therefore draw the consequence that “even a very high statistical probability, interpreted as the ‘symptom’ of a causal dependence, does not guarantee the causal imputation of the single event. For example, it is considered as statistically proved the smoking can ‘produce’ lung cancer, but not only are there heavy smokers who do not contract lung cancer, there are also many persons who contract lung cancer without having ever smoked (so smoking does not constitute a *sine qua non* condition). Therefore, even if we diagnose lung cancer in a smoker we cannot conclude with certainty that smoking has been the cause”.

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<sup>13</sup> E. AGAZZI, *op,loc.citt.*

<sup>14</sup> For a useful summary of the debate on the idea of regularity and necessity, see also LAUDISA, *op. cit.*, pp. 14 et seq., 77 et seq.

Hence the consequence that, “*a fortiori*, a statistical correlation of low frequency is **absolutely** unable to establish the causal imputation of the single event”<sup>15</sup>.

In conclusion, we can certainly agree on the debatable nature of the explanatory character of even those statistical laws provided with a frequency limit very close to 1, and we can therefore recognize that the explanatory character is to be reserved for those laws which express a degree of necessity, that is to say to deterministic laws of a universal nature, such as the causal laws<sup>16</sup>.

The practical result, however, is not changed, because it hardly ever happens that the judge has to deal, when explaining single events, with statistical laws which, as in the example I have given, are provided with an overwhelming probability, with an expected frequency close to 1.

It is for this reason that the judges best equipped for the task of assessing the “**intuitive**” elements – such as the Justices and jurors of the American Courts – are irremovably oriented towards attributing explanatory power only to deterministic laws, that is to say to the laws which are associated with the idea of necessity. The vast majority of the courts affirm, in fact, that individual causation and single events can be explained only by laws which enunciate an invariability in the succession of events, such “given A, B follows B”<sup>17</sup>. It is amazing therefore, to say the least, that the jurisprudence of our country considers it necessary to reject the model based on universal causal laws. It is amazing because the “ample warehouse of science” contains a long list of deterministic laws in spite of the statement of the Full Bench of our Supreme Court in the Franzese sentence of 2002, according to which there are very few universal laws<sup>18</sup>.

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<sup>15</sup> E. AGAZZI, *op. loc. citt.*

<sup>16</sup> All modern epistemology agrees in affirming that only universal laws can be considered causal laws. I recall the words of, among Italian philosophers of science, Pasquellini: “**Causal succession**, or simply causal, laws, are those which ... affirm the existence of an invariable or uniform (and physically necessary) relation between the facts”. (PASQUINELLI, *Nuovi principi di epistemologia*, Milan, 1964, rep. 1987, Bologna, p. 122 et seq.). Another great Italian philosopher of science, Dario Antiseri, says the same thing ( D. ANTISERI, *Trattato di metodologia delle scienze sociali*, Turin, 1996, p. 285 et seq.); and outside Italy the same things have been stated and repeated by philosophers of science of the stature of POPPER (“to give a **causal explanation** of an event means to deduce a statement which describes it, using as premises of the deduction one or more **universal laws**, together with certain singular statements, the initial conditions”, K. POPPER, *The Logic of Scientific Discovery*, New York, 1965, p. 59), of Ernst NAGEL (“The law is said to be a **causal** one apparently because the relation it formulates ... is an invariable or uniform one, in the sense that whenever the alleged cause occurs so does the alleged effect”, NAGEL, *The Structure of Science*, London, 1971, p. 74; of CARNAP (“a causal law simply states that, whenever an event of the kind *P* ... occurs, then an event of the kind *Q* will follow”, R. CARNAP, *Philosophical foundations of Physics*, London 1966, p. 196), and of many other philosophers of science who have dominated the contemporary debate on causation. The deductive-nomological model, furthermore, has been joined, particularly through the work of Hempel, by the nomological-inductive model, the *explanans* of which contains statistical laws and which, for that reason, does not deductively imply the *explanandum*. Explanations of single events, obtained through the use of this model, have been divided into **authentic** explanations and inadequate explanations, according to the degree of frequency of the succession of events, expressed by the statistical law: thus, we will have a **genuine** explanation of the single events if the inductive support, represented by the nomological premises, is very strong (that is to say, if the regularity announced by the statistical law reaches **almost** 100% of the cases). When this is not so, it will not be possible to arrive at an adequate **genuine** explanation. Students of the theory of knowledge affirm that, in the case of a statistical-type law, we have a proposition establishing that under conditions more or less complex of the *f* type, we will have the occurrence of the event or result of the *c* type, with a statistical probability (in simple words, with a relative frequency over a long series) of *q* (...). If the probability *q* is **close to 1**, a law of this type can be invoked to explain the occurrence of *c* in a given particular case in which the conditions *f* have been realized. “If the observed long-run frequency of an outcome is not close to the probability assigned to it by a given probabilistic hypothesis, then that hypothesis is *very likely to be false*. In this case, the frequency data count as disconfirming the hypothesis” (C. HEMPEL, *Philosophy of Natural Science*, Englewood Cliffs, 1966, p. 65).

<sup>17</sup> Cf. the sentences I quoted in *Giustizia e modernità*, *op. cit.*, p. 308 et seq., for which generalizations of the type “given A, B follows in most cases” are unusable since individual causation can be explained only by laws which say that “given A, B necessarily follows”. For a panorama of these sentences inspired by the deterministic vision, see T. BRENNAN, *Causal Chains and Statistical Links: The Role of Scientific Uncertainty in Hazardous Substance Litigation*, in *Cornell L. Rev.*, 1988, p.493 et seq.

<sup>18</sup> Cass. Un. Sez., 10.7.2002 in *Riv. it. dir. proc. pen.*, 2002, p. 1133 ss. For an exemplary list of deterministic laws, ved. STELLA, *Giustizia e modernità*, *op. cit.*, p. 343 et seq.

3. *The imperfection of our knowledge: the tacit assumptions in the Italian model and in the American model of the instantiation of the causal law.* – The identity of views between my thought and that of WRIGHT, with reference to the covering law model, is also absolute concerning the use of tacit assumptions and the *coeteris paribus* clause.

In my book of 1975 I dedicated many pages to illustrating the imperfection of our knowledge: we do not know all the laws and the initial conditions which should be specified for a **certain** explanation; the scientists of today know much more than the scientists of a century ago and much less than those of a hundred or a thousand years hence; but it is to the complete system of laws and initial conditions that we should refer in order to obtain a true explanation of the single events. Notwithstanding this, we give explanations founded upon present-day scientific knowledge and we do this tacitly assuming that we know also the laws and initial conditions that are not yet known. Ours are explanations which we accept with the *coeteris paribus* clause: we accept them knowing that they are not certain explanations and that they may one day be substituted by other explanations. It was precisely this use of tacit assumptions which induced me to underline the essentially probabilistic nature of the explanations obtained through the covering law model: the causal pronouncements on the single harmful events are **probabilistic**, in the sense that they are rationally credible (logical probability) at our current state of knowledge<sup>19</sup>.

The views set out by WRIGHT are identical: “due to imperfect knowledge we rarely if ever can fully specify causal law. Instead, we employ *causal generalizations*, which list only some, not all, of the abstract antecedent conditions that would be found in the fully specified causal laws”. It is for this reason, WRIGHT insists, that “even if, on a particular occasion, the result and all the known antecedent conditions specified in a causal generalization have been instantiated, **we cannot be certain** that any of the actual antecedent conditions was a cause of the actual result, because **we cannot be sure** that all the **unknown** antecedent conditions that must be added to the causal generalization to convert it into the fully specified causal law have also been instantiated”. Nonetheless, WRIGHT concludes, “we can and do make justifiable single causal attributions, despite our incomplete knowledge of causal laws and the details of actual events. In our world of imperfect knowledge, a singular causal statement asserts a **belief** that ... [a] ... causal law ... was fully instantiated on a particular occasion<sup>20</sup>.”

In other words, again according to WRIGHT, “when we assert that a particular actual antecedent condition was a cause of some actual result, we are asserting that: a) the actual result and the actual antecedent condition instantiate an abstract result and an abstract antecedent condition listed in some causal generalization, b) all the other abstract antecedent conditions, if any, listed in that causal generalization have also been instantiated, or at least there is no reason to believe they have not, c) all the unknown abstract antecedent conditions that complete the causal law have been instantiated. The third assertion, which is critical, is an inference drawn from the **sufficiently high probability** that this particular causal generalization is applicable in the specific circumstances and of the **sufficiently low probability** that any competing causal generalization is applicable<sup>21</sup>.”

It is worth noting that these considerations of WRIGHT, which coincide so much with my own, find powerful support, among contemporary doctrine, in the reflections by HART and HONORÉ<sup>22</sup> and, among contemporary philosophy, in those of MACKIE<sup>23</sup>.

4. *The non causal concept of probabilistic causation and its incapability to substitute the Italian and American covering law models.* – Proceeding with my analysis of the analogies between my

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<sup>19</sup> Cf. F. STELLA, *Leggi scientifiche*, op. cit., p. 315 et seq., as well as *Giustizia e modernità*, p. 367 et seq.

<sup>20</sup> Cf. R. W. WRIGHT, *op. cit.*, p. 1045.

<sup>21</sup> Cf. R. W. WRIGHT, *op. cit.*, p. 1046.

<sup>22</sup> H. L. A. HART & T. HONORÉ, *Causation in the Law*, Oxford, 1st ed., 1959, pp. 31-32, 44-49, 111-113.

<sup>23</sup> Ved. J. MACKIE, *op. cit.*, Chap. 3 pp. 66 et seq., 76 et seq.



thought and that of WRIGHT on the matter, I shall now examine the incompatibility of the covering law model as the instantiation of the covering law with the notion of probabilistic causation.

According to supporters of “probabilistic causation” an antecedent is the cause of a concrete event if it has increased the probability – the risk – that the event might take place.

Many pages of *Giustizia e modernità* were dedicated to demonstrating that this probability associated to risk, to its increase or to the failure to reduce it (and so, in particular, the results of epidemiological research and tests on animals), tells us absolutely nothing about what actually happened. It belongs to the field of **general causation** and not to that of individual causation, that is to say to the causation of this or that actual antecedent, with regard to the single or individual event<sup>24</sup>.

WRIGHT comes to the same conclusions: he reminds us that the non causal concept of probabilistic causation originated in America with the legal economists and has their almost unanimous support because it is an indispensable concept for the efficiency theory in the context of liability for damage. If the problem is that of identifying the *ex ante* incentives for efficient conduct, then there is nothing better than the criterion of the increase in risk to discourage inefficient conduct<sup>25</sup>.

This, WRIGHT observes, is a **non causal** concept of causation, and “a very strange concept: ... Even when the result [or the increased risk] occurs, we all recognize that a condition may increase the probability that the result will occur through causal process A and yet not contribute to its actual occurrence, which instead is due to causal process B. The other conditions required to complete causal process A may be missing, or causal process B may preempt causal process A. Conversely, it is also clear that a condition may be a cause of the result even though it has no effect on, or even decreases, the probability that the result will occur”<sup>26</sup>.

Luckily, in the framework of jurisprudence, WRIGHT and all the other adversaries of probabilistic causation are knocking at an open door. Most American Courts reject unhesitatingly the increased risk theory and general causation as causal concepts and uphold firmly the idea that general causation has nothing to say on the existence of a causal relationship between an actual antecedent and an actual event<sup>27</sup>. Even those courts which see increased (when doubled) risk as a criterion for assessing liability, do so declaring that the price of this choice is the rejection of causation as a rationale for imputation, in a new vision of the functions of **civil law**<sup>28</sup>.

In our country, this awareness has been slow to penetrate in our **criminal law**: it was only a couple of years ago that the *Sezioni unite* of the *Corte di Cassazione* held non causal, and so extraneous to our juridical system, the criterion of increased risk. This holding has touched the raw nerves of those who wish to punish at all costs, with the result that part of the 4<sup>th</sup> penal section of the Supreme Court has rebelled against the *Full Bench* and, in a series of sentences subsequent to

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<sup>24</sup> Cf. STELLA, *Giustizia e Modernità*, op. cit. p. 294 et seq. Ved. also ID., *L'allergia alle prove della causalità individuale*, op. cit., p. 379 et seq.

<sup>25</sup> Cf., e.g., G. CALABRESI, *Concerning Cause and the Law of Torts: An Essay for Harry Kalven Jr.*, in 43 *U. Chi. L. Rev.*, 1975, pp.71-72, 73-74, 78, 84-85 (causal link, on which ved. STELLA, *Giustizia e modernità*, op. cit., p. 486 et seq.); ved. also COOTER, *Torts as the Union of Liberty and Efficiency: An Essay on Causation*, in 63 *Chi.-Kent L. Rev.*, 1987, p. 534 and note 32 (probabilistic cause), pp.541-544 (material cause); LANDES-POSNER, *Causation in Tort Law, An Economic Approach*, in 12 *J. Legal Stud.*, 1980, pp. 109-116, 134 (*ex ante* risk analysis allegedly explains courts' decisions on causation); SCHWARTZ, *Causation in Private Tort Law: A Comment on Kelman*, in 63 *Chi.-Kent L. Rev.*, 1987, pp. 639-640, 645 note 14 (probabilistic cause); SHAVELL, *An analysis of Causation and the Scope of Liability in the Law of Torts*, in 9 *J. Legal Stud.*, 1980, pp. 466, 468-469 note 17 (probabilistic cause); cf. also RIZZO, *The Imputation Theory of Proximate Cause: An Economic Framework*, in 15 *Ga. L. Rev.*, 1981, pp. 1007 et seq., 1009-1016, 1037-1038 (“probabilistic causation” used in non efficiency “economic” framework), all quoted by WRIGHT, op.ult.cit., p. 1004-1005.

<sup>26</sup> R. W. WRIGHT, *op. cit.*, p. 1043.

<sup>27</sup> Cf. the sentences quoted in F. STELLA, *Giustizia e modernità*, op. cit., pp. 308 et seq., 318 et seq.

<sup>28</sup> Cf. the sentences quoted in F. STELLA, *Giustizia e modernità*, op. cit., p. 318 et seq.

the Franzese opinion, has considered general causation alone to be sufficient grounds for conviction<sup>29</sup>.

5. *The explanatory function of the model and the failure of naked statistics to have explanatory power.* – It is evident that the covering law model and the instantiation of the causal law have nothing to do with naked statistics.

I have dealt with this argument when analyzing the reference contained in the Franzese sentence to medium-low frequency, understood as frequency in the succession of events possessed of explanatory power with regard to the single harmful event. On that occasion I demonstrated that the position taken by the Full Bench of the Supreme Court could only be the result of an oversight<sup>30</sup>.

Mere frequency in the succession of events – whether low, medium or high – is not built on cases **demonstrably caused** by other events, but on a census of events which follow each other, one after the other, and which therefore do not have any explanatory power. To affirm, therefore, that the causal imputation can be based on a statistics which indicate a mere frequency means recurring to the fallacy of the *post hoc, ergo propter hoc*, that is to say to a scientifically discredited criterion which has always been rejected by students of causation and by jurisprudence itself<sup>31</sup>. It is a naked statistic: it has nothing to do with the instantiation of a causal law, that is to say with the model of covering laws which, by their intrinsic nature, have the capacity to explain the single harmful event.

WRIGHT, too, analyzes naked statistics and does so in a wider perspective than that examined by me. By this expression the scholar refers to every statistic which “is not related to any possibly applicable causal generalization”, regardless of whether the statistic has been explicitly quantified. Adhering to the views of COHEN, a great scholar of statistics applied to the trial, WRIGHT affirms that, “since it is not related to any possibly applicable causal generalization, a naked statistic is of no use for... causal explanation”<sup>32</sup>.

In his clarification of what is meant by the expression “naked statistics”, WRIGHT refers to the paradox of the gatecrasher, formulated by JONATHAN COHEN<sup>33</sup>. “Cohen hypothesizes a situation in which 1000 people attended a rodeo, but only 499 paid for admission, so that 501 were gatecrashers. He further assumes that no tickets were issued and that there is no other way to establish who actually paid and who was a gatecrasher. Given the happenstance that over half of the spectators were gatecrashers, there is a 50.1% naked mathematical probability that any particular spectator was a gatecrasher.” Accepting this naked statistic, in a **civil** case, by the rule of the preponderance of the evidence, “each and every one of the 1000 spectators can be held civilly liable for gatecrashing.” COHEN thereby deduces that the application of the standard of the preponderance of the evidence on the basis of naked statistics and mathematical probability is incorrect.

Along similar lines, GLANVILLE WILLIAMS recognizes that it is mistaken to declare the defendant liable “even if there is a ninety-five per cent naked statistical chance that he tortiously caused the plaintiff’s injury”<sup>34</sup>.

WRIGHT adds that naked statistics do not have any weight as a proof of what actually happened in a particular circumstance. In order to establish what actually happened, we must establish which underlying causal law was instantiated in the case being considered. And naked

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<sup>29</sup> Cf. the sentences commented on by STELLA in *L’allergia alle prove della causalità*, op. cit., p. 394 et seq.

<sup>30</sup> Cf. F. STELLA, *Verità, scienza e giustizia: le frequenze medio-basse nella successione di eventi*, in *Riv. it. dir. Proc. Pen.*, 2002, p. 1231 et seq.

<sup>31</sup> On this fallacy ved., as to the sentences issued by the 4th penal section of the *Corte Suprema*, F. STELLA, *Fallacia e anarchia metodologica*, op. cit., p. 28 et seq.

<sup>32</sup> R. W. WRIGHT, op. cit., p. 1054.

<sup>33</sup> J. COHEN, *The Probable and the Provable*, Oxford, 1977, p. 75; cf. also F. STELLA, *Giustizia e modernità*, op. cit., p. 404.

<sup>34</sup> GLANVILLE WILLIAMS, op. cit., p. 305. Cf. also D. KAYE, *The Limits of the Preponderance of the Evidence Standard: Justifiably Naked Statistical Evidence and Multiple Causation*, in *Am. B. Found. Res. J.*, 1982, p. 488.

statistics are not probative because they do not instantiate any element in a potentially applicable causal generalization.

In order to make it all the more clear that naked statistics have no probative value in the reconstruction of what actually happened, and how it happened and by whom, WRIGHT makes use of a well-known example: X has fired 99 bullets at V, Y has fired only one, a single bullet hit V and killed him; the single bullet is identified by its markings, through ballistic tests performed on the guns of both X and Y. The markings on the bullets are particularistic evidence that the bullet that killed V came from Y's gun, not from X's. On this hypothetical, KELMAN, another student of mathematics applied to the trial<sup>35</sup>, claims that naked statistics allow us to declare *ex post* that it is more probable that X and not Y killed V, and that there is no reason to prefer the particularistic evidence of the ballistic test to naked statistics. He points out in fact that ballistic tests are not accurate and assumes they have only an 80% plausibility. Then WRIGHT observes that, even accepting the idea that the ballistic tests on both guns were 80% correct, we are allowed to calculate a 94% *ex post* probability that the bullet which killed V came from Y's gun, compared with a 6% *ex post* probability that it came from X's. The calculated probability would be sufficient to satisfy the preponderance of the evidence standard, required by the **civil** trial, that Y and not X caused the death of V.

A second argument against KELMAN's criticism is that there exists no causal generalization which can refer to the 99 bullets fired by X. The only available causal generalization is that "if one or more shots are fired that hit the vital organs of a person, that person dies", and since Y has fired a bullet which bears the irregular marks of Y's gun, we have a particularistic proof of the instantiation, by Y, of the causal generalization.

These are the reasons that induce American Courts to reject naked statistics as proof of what actually happened<sup>36</sup>.

6. *The distinction between ex ante and ex post probability in the American model and its utility for the Italian model.* – Another fundamental point of WRIGHT's thought, which completes and defines my point of view on the application of the covering law model, and is extremely useful for understanding the functioning of that model, is the distinction between *ex ante* and *ex post* probability.

Having underlined the imperfection of our knowledge I had reached, as we have seen, the conclusion that single causal statements have a probabilistic nature<sup>37</sup>. WRIGHT investigates the subject further and taking for granted this probabilistic nature, illustrates the concept of *ex post* probability, distinguishing it from that of *ex ante* probability. Having defined particularistic evidence as a feature of a single case which instantiates one of the abstract elements of the potentially applicable causal generalization, he observes that *ex post* causal probability is "case-specific probability, based solely on the particularistic evidence specific to a particular occasion", that the potentially applicable causal law has been fully instantiated. Here lies the distinction between *ex post* and *ex ante* causal probability, the latter is "an abstract class-based probability", independent of and unconnected with the specific particularistic proof of the single case, offered by the instantiation of the causal law<sup>38</sup>.

WRIGHT, who is a civil lawyer, is concerned to identify the *ex post* causal probabilities necessary in order to be able to speak of a **preponderance of the evidence**, that is to say in order to satisfy the more-probable-than-not standard; but WRIGHT's observations are important for the penal lawyer too. In criminal trials the standard to be applied is that of **beyond reasonable doubt**;

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<sup>35</sup> KELMAN, *The Necessary Myth of Objective Causation Judgments in Liberal Political Theory*, in *Chi.- Kent L. Rev.*, 1987, pp. 792-793.

<sup>36</sup> R. W. WRIGHT, *op. cit.*, p. 1059 et seq.

<sup>37</sup> Cf. F. STELLA, *Leggi scientifiche*, *op. cit.*, pp. 275 et seq., 311 et seq.

<sup>38</sup> R. W. WRIGHT, *op. cit.*, p. 1050 and *ivi* the listing of American opinions which reject *ex ante* probability as an instrument for assessing individual causation.

it is therefore to this rule that reference must be made in order to establish whether the *ex post* causal probabilities of the single causal statements are sufficient to find the defendant guilty. For the purpose of understanding the role played by the *ex post* causal probability of the single causal statements in the criminal trial I had TRIBE's work on beyond reasonable doubt translated and published.<sup>39</sup>

7. *Ex ante probabilities and lost chances in medical-surgical activity.* – Reduced to the essence, the old school of Italian jurisprudence in assessing criminal liability in medical malpractice cases adopted the well-known formulas of the “appreciable possibility” or variously quantified “probabilities” (30%, 50% or close to 100%) in stating the life-saving efficiency of an action which was due but not taken.

In this way, our jurisprudence shows that it does not have a very clear idea of the distinction between *ex ante* and *ex post* probability, a distinction which, as we have seen, is one of the mainstays of the thought of WRIGHT. Our jurisprudence therefore has to come to terms with the observation that *ex ante* probabilities tell us nothing about what actually happened; they do not provide particularistic evidence of the instantiation of a law of medical science and thus do not permit an assessment of the *ex post* probabilities which, to convict the defendant, should characterize the single causal statement.

Progress can only be made if, as WRIGHT emphasizes, we are aware that “often it can be proven that the doctor negligently reduced the chance of the patient's avoiding some manifested injury or increased the risk of its occurrence, but not that the doctor's negligence actually contributed to the manifested injury”; “even under the NESS test ... there are cases in which it is impossible to determine whether or not the defendant's tortious conduct contributed to the plaintiff's injury”<sup>40</sup>.

In the context of civil trials, the American Courts unanimously agree that mere proof of increased risk or the mere probability of the harmful result is insufficient to establish the cause of death or injury of the patient. For this very reason, to allow compensation they can take two different approaches. Under the first one, they set aside the requirement of causation requiring only evidence that the doctor has reduced sufficiently the victim's chances of avoiding the injury or has increased the risk of the occurrence of the event. Under the second approach the requirement of causation is not referred to the harmful result but to the exposure to risk.

Here follow the findings of some decisions which have chosen to take the first approach (the reduction of the victim's chances or the increased risk without proof of the causal relationship).

In *McBride vs. United States*, a case of the death – by a fatal heart attack – of a patient seized by myocardial infarction and not treated immediately in the coronary care unit, the 9<sup>th</sup> Circuit Court of Appeal allowed compensation affirming that: “The expert testimony presented statistical data on two phenomena: the effect of hospital treatment on a patient's chance of surviving a heart attack, and the longevity of patients who have survived initial attacks. All medical witnesses agreed that treatment in a coronary care unit significantly enhances the likelihood of successfully surviving a heart attack. Although hospitalization cannot prevent the attack or reduce its severity, treatment does lessen the impact of the heart failure upon the patient's vital functions. Only 15% of those admitted to coronary care die from their first heart attacks. The mortality rate outside hospitals is 30 to 35%”<sup>41</sup>.

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<sup>39</sup> See *I saperi del giudice*, Milano, 2004, edited by F. STELLA.

<sup>40</sup> R. W. WRIGHT, *op. cit.*, p. 1067.

<sup>41</sup> *McBride v. United States*, 462 F.2d 72 (1972), pp. 6-7. A completely analogous decision was reached by the Colorado Court of Appeal in *Sharp v. Kaiser Foundation Health Plan of Colorado*, 710 p.2d 1153 (1985), in which we read that “15% of all patients with unstable angina who are appropriately treated with medical or surgical care will still sustain a heart attack over the short term. Patients with unstable angina who do not receive appropriate medical treatment appear to have a risk factor of approximately 35 to 40%”.

In the same way the Tennessee Supreme Court, in the *Truan v. Smith*, based itself on a simple increase in risk in order to affirm the plaintiff's right to damages. The case brought to the Justices was that of a lady who, in October 1973, had had a breast examination without the doctor (Dr. Truan) noticing anything abnormal. A few months later, in March 1974, the lady called Dr. Truan's attention to an increase in the size and firmness of her breast, together with a progressive discoloration in the nipple area. In spite of this the doctor did not feel that an examination or further more specialized examinations were necessary. Then, during a hospital visit in July 1974, a cancerous mass was diagnosed with metastasis to 24 of the 40 lymphonodes. Starting from the remark that the tumor could (and should) have been diagnosed at the time of the two examinations carried out by Dr. Truan, the Court allowed compensation to the lady, stating that "the earlier the cancer is diagnosed the better the prognosis of the patient" and that the patient's chances for survival decline drastically on the metastasis of the cancer. "This, of course, places a premium on early and correct diagnosis and treatment of cancer in a patient". For this reasons - the Court concluded - since it is undeniable that, had Mrs. Smith's cancer been diagnosed and treated earlier, her "chances of either remission or recovery would have materially increased, ... the jury could reasonably conclude that ... Dr. Truan did not exercise that degree of care and diligence required of him in providing medical care to Mrs. Smith, and that this lapse either materially increased the chances of or accelerated Mrs. Smith's death"<sup>42</sup>.

It would be possible to give innumerable further examples of sentences which have followed the approach of increased risk<sup>43</sup>, but the two opinions quoted above are sufficiently eloquent in themselves. Equally clear, though from the opposite perspective, are the sentences which follow the second approach (the damage results in the increased risk but the causal link with the latter is to be proved).

To this group belongs, for example, the Iowa Supreme Court opinion in *De Burkarte v. Louvar*. In this case too the plaintiff was a woman affected by breast cancer to whom the doctor, having observed the presence of a lump in her breast, had prescribed only a mammogram, without requiring a biopsy examination. The biopsy, performed over a year later, revealed the presence of more lumps. Having disallowed compensation for failure to establish a causal link, the Court concentrated on damages for "lost chance of survival" and concluded that "a more rational approach, however, would allow recovery for the loss of the chance of cure even though the chance was not better than even ... even with a timely diagnosis the patient would have had only a 30% chance of recovering ... While the plaintiff here could not prove by a preponderance of the evidence that he was denied a cure by the defendant's negligence, he could show by a preponderance that he was deprived of a 30% chance of a cure". This probability was obviously reflected in the amount of the damages<sup>44</sup>.

On the same wavelength, among the numerous sentences which accept the theory of the increased risk with proof of the causal link with this latter<sup>45</sup>, it is to be placed the decision of the Oklahoma Supreme Court in *McKellips v. Saint Francis Hospital*. The Court confirmed that "in

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<sup>42</sup> *Truan v. Smith*, 578 S.W.2d 73 (1979), pp. 76-79.

<sup>43</sup> *Hamil v. Bashline*, 481 Pa. 256; 392 A.2d 1280 (1978), p. 19; *Brown v. Koulizakis*, 229 Va. 524 (1985), 331 S.E.2d 440, pp. 532-533; *Jeans v. Milner*, 428 F.2d 598 (1970), pp. 604-605; *Thomson v. Sun City Community Hosp.*, 141 Ariz. 597, 688 P.2d 605 (1984), pp. 605-608; *Northern Trust v. Weiss Memorial Hosp.*, 143 Ill. App. 3d 479, 493 N. E.2d 6, (1986), pp. 486-488; *Roberson v. Counselman*, 235 Kan. 1006, 686 P.2d 149, (1984), pp. 1020-1021; *Hastings v. Baton Rouge Gen Hosp.*, 498 So. 2d 713 (1986), pp. 720-721; *Evers v. Dollinger*, 95 N.J. 399 (1984), pp. 404-406, 413-417; *Kallenberg v. Beth Israel Hosp.*, 45 A.D.2d 177 (1974), pp. 179-180; *Thornton v. CAMC, Etc.*, 305 S.E.2d 316 (1983), pp. 323-325; *McKellips v. St. Francis Hosp.*, 741 P.2d 467 (1987), pp. 472-477; *Daniels v. Hadley Memorial Hospital*, 185 U.S. App. D.C. 84 F.2d 749 (1977), p. 22.

<sup>44</sup> *De Burkarte v. Louvar*, 393 N.W.2d 131 (1986), pp. 19-20. Similarly, ved. *Morrison v. Stallworth*, 73 N.C. App., 196, 326 S.E.2d 387 (1985), p. 14 et seq.

<sup>45</sup> *Weimer v. Hetrick*, 525 A.2d 643 (1987), pp. 651-653; *Herskovits v. Group Health Coop.*, 664 P.2d 474 (1983), p. 479; *O'Brien v. Stover*, 443 F.2d 1013 (1971), pp. 1018-1019; *Mays v. United Sates*, 483 F. Supp. 581 (1980), pp. 586-587; *Glicklich v. Spievack*, 452 N.E.2d 287 (1983), pp. 290-292; *Aasheim v. Humberger*, 695 P.2d 824 (1985), p. 827-828.

medical malpractice cases involving the loss of a less than even chance of recovery or survival”, the task for the jury was to decide whether the doctor’s failure to observe the professional rules was effectively the cause of the patient’s lost chances of recovery. If the jury’s judgment was affirmative, “a total recovery for all damages attributable to death” would not be allowed and damages would be limited to the chances effectively lost<sup>46</sup>.

The picture which emerges is the fruit of a new viewpoint on the functions of **civil law** and corrective justice. Also in the field of medical malpractice, in short, in American case law the same thing is happening as happened in that of exposure to toxic substances: the Courts which follow the “**weak version of the more-likely-than not**” believe that the requirement of causation can be set aside and adopt the criterion of increased risk to assess the liability of the defendant<sup>47</sup>.

What strikes me mostly is the pragmatic approach of the American courts to face up to the problem of compensation for damages; when it is not possible to prove the causal link, and it is felt that corrective justice imposes to allow compensation, the “but for” or the NESS test are set aside and it is explicitly declared that the criterion to assess liability is to be sought in the very different field of increased risk.

This awareness is lacking in a good number of Italian criminal judges: they wish to punish the negligent behavior of doctors, but they will have it believed that proof of causation can be provided by demonstrating lost chances or increased risk, that is to say by *ex ante* probabilities that tell us nothing about what actually happened and about the existence of the causal link. The civil judges, on the other hand, do not even dream of following the path of the American Justices with the result that the “victims” cannot benefit from the probative standard of the preponderance of the evidence or “more likely than not”, typical of the civil trial<sup>48</sup>.

And yet it is this distinction between *ex ante* and *ex post* probability, on which WRIGHT insists so strongly, together with other American civil lawyers, which could mark the beginning, in our country, of a radical rethinking of the matter which should result in ceasing to find the defendants criminally guilty in most of the medical malpractice cases, but at the same time reviving civil liability on a larger scale.

8. *Summing up*. – All things considered, WRIGHT’s work – the work of a great contemporary legal scholar – confirms what I have always affirmed on the basis of assumptions which, after the centuries-long debate opened by HUME’s work, might now be considered pacific. Without reference to regularity no explanation of single events is possible and therefore the identification of the necessary condition is not possible: without the regularity expressed by the scientific laws, there is no way of identifying, among the **infinite** facts of the world, that event which constitutes the cause of the fact to be explained. Something is needed which links the two events, which are immersed in a sea of facts, to each other, and that something consists only of laws: “**it is the laws which link facts to each other**”<sup>49</sup>. At the root of this observation lies the **intuitive** use of the concept of cause – which explains the fortune of the explanatory model based on laws and regularity. A model adopted even by laymen - as are the juries of the American courts – after a whole series of elaborations by philosophers and scientists which has proceeded without interruption from HUME to the present day.

Together with the intuitive explanation and the scientific explanation of single results goes also the limitation of relevant scientific laws to those which express a necessity vested with universality, that is to say to the deterministic laws; it is only these laws, those statements commonly defined by epistemologists as causal laws<sup>50</sup>, that constitute the essential premise of the

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<sup>46</sup> *McKellips v. St. Francis Hosp.*, 741 P.2d 467 (1987), p. 6 et seq.

<sup>47</sup> Ved. the sentences quoted in F. STELLA, *Giustizia e modernità*, op. cit., p. 318 et seq.

<sup>48</sup> Cf. F. D’ALESSANDRO, *La perdita di chances secondo la Cassazione civile: una tutela praticabile in tema di responsabilità colposa del medico*, in *Cass. Pen.*, 2004, p. 2537 et seq.

<sup>49</sup> D. ANTISERI, *Trattato di metodologia delle scienze sociali*, op. cit., 289 et seq., and *ivi* a very rich bibliography.

<sup>50</sup> Ved. *retro*, par. 2.

*explanans* (to be pedantic, the causal laws can be flanked by those statistical laws which express such an overwhelming probability as to be able to explain a single event).

This is why there are no alternatives: there is no way to find surrogates to the covering law model or to the instantiation of a causal law; all attempts to find surrogates have resulted in fallacious arguments, logically unsustainable, or in arguments which imply the rejection of the proof of causal relationship.

## SECTION II

*MACKIE's INUS condition and WRIGHT's NESS test; the impossibility of substituting the sine qua non condition and the but for test.*

1. *The INUS condition.* In his paper "Causation, Responsibility, Risk etc." WRIGHT debates with the philosopher JOHN L. MACKIE their different views of the concept of cause. He attempts to demonstrate that his NESS test (*Necessary Element of a Sufficient Set*), wins the competition when compared with Mackie's INUS test (*Insufficient but Non-Redundant element of an Unnecessary but Sufficient Condition*).

It is an important topic also for the Italian covering law model, since it aims to clarify whether the reference to covering laws remains indispensable and whether the model should continue to be based on the concept of the necessary condition, or whether this should instead be substituted by the INUS condition or the NESS test.

I will analyze first the INUS condition.

What said MACKIE ? He affirmed that when we say that a certain event A is the cause of another event B, what we really mean, in the majority of cases, is that the occurrence of A "is an *insufficient but non-redundant* part of an *unnecessary but sufficient* condition"<sup>51</sup>.

The example from which MACKIE's analysis starts is that of a short circuit followed by a fire in a house<sup>52</sup>. An event such as this is not sufficient, generally speaking, to determine by itself the destruction of the house by fire, because the spreading of the fire may be prevented in many ways or an effective safety system may come into function. Moreover, different events from the short circuit, for example a terrorist attack, could have caused the fire.

On the basis of these considerations, says MACKIE, it can be said that the short circuit followed by the fire was accompanied by a set of conditions: the sum (let us call it S) of the first and the second constitutes a sufficient, but not necessary condition for the destruction of the house, in view of the fact that the fire could have been created by **other sets of conditions**. The short circuit, on the other hand, is an essential part of the sum S, in the sense that if the short circuit were "subtracted" from S no fire would take place.

The philosophical consequences which MACKIE draws from the analysis of this example are, therefore, that "when we say that a certain event A is the cause of another event B, what we really mean in the majority of cases is that the occurrence of A is an **insufficient but necessary** part of a condition which is in itself **not necessary but sufficient** for the occurrence of B"<sup>53</sup>.

At this point it can be understood how important it is to clarify the meaning attributed by MACKIE to the notion of sufficient condition and necessary condition: to say that the occurrence of C is a sufficient condition for the occurrence of E means that, in MACKIE's viewpoint, "there exist **universal** and true propositions from which, given certain singular additional premises and the fact that C actually occurred, derive the occurrence of E. That the occurrence of C is a necessary condition for the occurrence of E means, instead, that there exist **universal** and true propositions from which, given certain singular additional premises and the occurrence of E, it can be deduced that C has actually occurred. The assertion of C as a necessary and sufficient condition for E depends in any case - according to MACKIE - upon the truth of a **counterfactual** conditional such as 'if C had not happened, E would not have happened' and a counterfactual conditional such as 'if C were to happen then E would happen'<sup>54</sup>.

These considerations allow us to affirm, according to the philosopher LAUDISA, that "MACKIE places his theory among **regularist** theories: the meaning of the necessary and sufficient

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<sup>51</sup> J. MACKIE, op. cit., Chap. 3, p. 62.

<sup>52</sup> J. MACKIE, *Causes and Conditions*, in *Am. Phil. Quart.*, 1965, rep. 1993, pp. 33-35.

<sup>53</sup> LAUDISA, *Causalità*, op. cit., p. 79 et seq.

<sup>54</sup> LAUDISA, op. loc. cit.



conditions depends on the validity of counterfactual conditionals and these, in their turn, depend upon laws”<sup>55</sup>.

AGAZZI reaches the same conclusions: using the example of the short circuit, AGAZZI observes that MACKIE’s elaboration constitutes “a refinement of the deductive-nomological perspective, since the analysis of ‘sets of circumstances’ which make up the sum S allows the construction of types of events which assume the role of nomological premises. Furthermore, the single chains of the various causal imputations always imply their own justification on the basis of laws”<sup>56</sup>.

We can therefore claim to have identified a very important first point: MACKIE’s work confirms the conclusions reached by me and by WRIGHT on dependence on “covering” causal laws.

The key question is another, however: does the INUS condition constitute a causal notion which is destined to take the place of the *sine qua non* condition that is at the base of the Italian covering law model? In other words, should criminal justice, when ascertaining the causal link, use the INUS condition as a criminally significant cause or should it remain faithful to the *sine qua non*?

I can say at once that MACKIE’s reflections on the concept of cause can certainly be shared from a logical point of view. This is also recognized – to remain in the field of “social practices” – by the medical epistemologists FEDERSPIL and VETTOR, for whom “the INUS condition appears to be a condition capable of describing adequately the type of causation which the clinician intends to resolve”<sup>57</sup>.

The two epistemologists give the following example: “a patient affected by atrial fibrillation and therefore undergoing treatment with oral anti-coagulants, has been complaining for some months of vague disturbances localized in the epigastrium; he has been affected for a week by a syndrome of influenza which has prevented him from going to his habitual prothrombin time check. He has eaten little during the progress of the influenza syndrome and, in order to control his fever and his cephalaea, he has taken a certain quantity of antipyretics (acetylsalicylic acid, paracetamol). Suddenly he presents a hematemesis. An esophagogastroduodenoscopy reveals gastritis and a bleeding gastric ulcer”. Thus, “the hematemesis could have also been provoked by causes or a set of causes other than those described, such as the breakage of an esophageal varice or a carcinoma of the stomach; however, in the case of our specific patient **that** set of causal factors was sufficient”. On the other hand, “the presence of an old *Helicobacter pylori* ulcer was not sufficient to provoke the hemorrhage; so it is realistic to suppose that the reduction in prothrombin time and the pharmacological actions of the acetylsalicylic acid were necessary to produce the bleeding”.

Another example is illustrated by FEDERSPIL in his very recent *Logica clinica*: “The appearance of subrenal tuberculosis in a non-European patient may have as its set of effective causes the entry of Koch’s bacillus in the respiratory system, the previous grave state of proteinic malnutrition, the inability to consult a doctor and effect a chest x-ray, cohabitation with a person affected by open pulmonary tuberculosis or the migration of the bacillus into the subrenal glands”.

If we reflect – continues FEDERSPIL – on the various elements which compose the effective set of causes in this patient, “we can observe that each of these has been necessary to produce the patient’s present pathological condition, but considered singly – the inhalation of Koch’s bacillus, the malnutrition, the cohabitation with a sick person, etc. – none of these can be considered a **sufficient** condition to produce the subrenal disease. On the contrary, this **effective set of causes**, considered as a whole, was **sufficient** to produce the illness in this patient, but cannot be considered **necessary**, since it would obviously have been possible for another, different set of circumstances to have produced the same result. If the patient had been able to consult a doctor and

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<sup>55</sup> LAUDISA, op. cit., p. 80.

<sup>56</sup> E. AGAZZI, *La spiegazione causale di eventi individuali (o singoli)*, op. cit., p. 404.

<sup>57</sup> FEDERSPIL-VETTOR, *Il problema della causalità in medicina clinica e sperimentale*, in *Atti e memorie dell’Accademia galileiana di scienze, lettere e arti in Padova*, Padua, 2002-2003, p. 33 et seq.

to have a chest x-ray, he could have been effectively cured during the initial phases of his pulmonary disease and would not have developed subrenal tuberculosis”<sup>58</sup>.

At this point it becomes easy to understand MACKIE’s definition of the INUS condition. FEDERSPIL illustrates it with the following design<sup>59</sup>:

<b>EFFECTIVE SET OF CAUSES I</b>	ABCDEFGH	→	
	ABCDEFG	≠	
			<b>E</b>
<b>EFFECTIVE SET OF CAUSES II</b>	ILMNOPQR	→	
	ILMNOPQ	≠	

A, B, C, D, E, F, G, H, I, L, M, N, O, P, Q, R = **INUS** condition

(Insufficient – Necessary – Unnecessary – Sufficient)

As can be seen, two different effective sets of causes are hypothesized, from which may derive event E. In the first there are 8 necessary conditions which together go to create a sufficient condition: condition H is a necessary condition in the first effective set of causes, but it is not a sufficient condition because to obtain event E the intervention of conditions ABCDEFG is indispensable; in the same way, in the effective set II condition R is a necessary but not sufficient condition because to obtain event E the intervention of conditions ILMNOPQ is indispensable. On the other hand, each of the two effective sets of causes is sufficient to produce the event but is not necessary since the event can be produced by the other effective set of causes. The INUS condition consists of the sum of the two effective sets of causes, that is to say of all the necessary conditions, including H and R.

The problem, however, is to see whether the INUS condition, however valid as an abstract idea, can be of some **utility** for disciplines such as medicine and penal law.

In the field of medicine, FEDERSPIL and VETTOR come to the conclusion that the INUS condition **does not resolve** the problems which the clinician has to face. With reference to the example of hematemesis they observe: “How can the clinician identify with certainty, among the various possible causal factors, those which are effectively necessary? If it can be affirmed that the set of causes which has been realized in our patient was certainly **sufficient** to provoke hematemesis, how can the clinician affirm **with certainty** that the reduction of prothrombin time or the gastrolesive action of ibuprofen were **necessary** factors for the hemorrhage to take place? In the end, then, it appears evident that while the identification of the causal factors which are **sufficient** to provoke a certain pathological situation seems possible, in a relevant number of cases the ascertaining of the **necessary** causal role played by any single factor is forever destined to remain hypothetical”<sup>60</sup>.

But the decisive blow to the practical utility of the INUS condition was dealt by FEDERSPIL in *Logica clinica*, when commenting the example of the non-European citizen who contracts tuberculosis: “It appears evident that all the non-redundant elements possess the same etiological dignity and that only **the concrete interest of the single student** can lead him to consider this or that factor as the cause of the illness. Thus, in our example, the **cause** of this illness will be proteic malnutrition, the **cause** will be Koch’s bacillus, the **cause** will be cohabitation with a

<sup>58</sup> G. FEDERSPIL, *Logica clinica*, Milan, 2004, p. 231.

<sup>59</sup> G. FEDERSPIL, op. cit., p. 232.

<sup>60</sup> FEDERSPIL-VETTOR, op. cit., p. 51.

sick person or the inadequate ventilation of the room and the **cause** will also be the social condition which prevents an immigrant from receiving adequate medical care. If one or other of these factors is concretely considered the **cause** of the event, this does not depend on their **relevance** in producing the result, something which is obviously impossible to establish in a single case, but depends on the **theoretical and practical interest** of the student who assesses the event”<sup>61</sup>.

These considerations prove particularly important also for criminal law.

In my previous essays on causation I have had the opportunity to analyze in depth the notion of the criminally relevant cause.

Here is a synthesis of my thought: “the criminal judge is not interested – immediately and directly – in what may be of interest for other considerations, such as those of philosophy, natural science, history or other ‘cultural’ sciences; he is not interested in the ‘**complete situation**’ which preceded the actual event”<sup>62</sup>, nor is he interested in the ‘historically’ relevant antecedent conditions, or the conditions that are relevant from the point of view of physiology, physics, psychology and so on. For him **one thing alone** is important: he wants to know if there is, between the man’s conduct and the event, a causal relationship such as to justify the application – all other premises being present – of penal law”<sup>63</sup>.

What counts, in short, is solely the criminal court judge’s **point of view**.

I have also dedicated a good many pages to the **point of view** of the criminal court judge in the identification of the concept of the relevant cause.

Having made the premise that the word “cause” has “a fairly wide spectrum of applications”, ranging from the philosophical to the logical concept, to that of the single sciences (physics, history, psychology, etc.) and to that of common language<sup>64</sup>, and that the very breadth of this spectrum, as NAGEL observes, “immediately excludes the possibility that a single, correct and favored explanation might exist”, I illustrated the crucial importance of the researcher’s **point of view** with the following example: “if the cause of a crash between two cars is being sought, a **road engineer** might say that the accident was caused by the slippery road: he is interested in the event from his point of view and chooses this as **the** cause. Equally, a **psychologist**, after interviewing one of the two drivers, might conclude that the latter was in an anxiety state and hence so worried that he did not pay attention to the arrival of the other vehicle at the crossroads, and that **the** cause of the accident is to be sought in his altered state. And then, an **automobile designer** might find a further cause, for example a structural defect in one of the two vehicles, while a **mechanic** might point out that the braking equipment of one of the two vehicles was not functioning. In short, each person, viewing the overall situation from his own point of view, will single out a particular antecedent and will nominate this as the **cause**. It appears clear, then, that what orients the causal attribution of an event to a particular antecedent circumstance or situation is exclusively the researcher’s **point of view**; his interest. Looked at this way, all the sciences which are concerned with causal explanations of single events have in common the same evaluative tendency”<sup>65</sup>.

It is for this reason that FEDERSPIL affirms that, in medicine, each researcher singles out a “decisive” antecedent from his own point of view which allows him to affirm legitimately that if this condition had not taken place, the event would not have happened<sup>66</sup>.

The truth is that many explanations of actual events in the natural sciences, the explanations of common sense, the majority of the explanations of disciplines such as history and the explanation of human actions in general are aimed at identifying “only one or more indispensable conditions”<sup>67</sup>;

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<sup>61</sup> FEDERSPIL-VETTOR, *Logica clinica*, op. cit., p. 233.

<sup>62</sup> On this concept, ved. CARNAP, *Philosophical foundations of Physics*, op. cit, cap. XIX, and the authors quoted in par. 6.2.

<sup>63</sup> F. STELLA, *La nozione penalmente rilevante di causa*, (The concept of cause penally relevant) in *Leggi scientifiche e spiegazione causale nel diritto penale.*, op. cit., p. 336.

<sup>64</sup> F. STELLA, *La nozione penalmente rilevante di causa*, op. cit., p. 332 et seq.

<sup>65</sup> F. STELLA, *La nozione penalmente rilevante di causa*, op. cit., pp. 334-335.

<sup>66</sup> Cf R. CARNAP, *Philosophical foundations of Physics*, op. loc. cit.

<sup>67</sup> E. NAGEL, op. cit., cap. XV.

and this is due to the fact that they are explanations which are always aimed at “the imputation of the consequences of actual causes to [particular] actual causes”<sup>68</sup>.

So what is the point of view, or the interest, which guides and directs the search for the cause in criminal law?

Criminal court judges, as we know, are called to establish whether the harmful event may be considered **the work of man**, and an occurrence for which man may be considered criminally liable: hence their recourse to a **criterion of imputation**, the use of a concept which allows them to attribute criminally relevant consequences to human actions. This is the requirement on which Articles 40 and 41 of the Italian Penal Code are based: in order for it to be attributed to an agent, the event must be the **consequence** of his action or omission; and the event is the consequence of a man’s conduct when, having mentally eliminated this latter, the event itself would not have occurred, that is to say when the action or the omission constitute a **necessary condition**, or a *sine qua non*.

Here lies the particular **practical value** assumed by the notion of cause in the criminal trial, the **utility** which allows us to distinguish the criminal law concept of cause from the concept used in other fields of inquiry.

If this is true, MACKIE’s conceptual structure, however acceptable from a logical point of view, becomes a **useless** instrument, redundant and extraneous with regard to the interests and the “point of view” which guide the judge in his search for the cause.

The criminally relevant cause continues to coincide with the necessary condition for the event, constituted by a man’s action, and the method for identifying it is the procedure of mental elimination or the *but for* test which a judge undertakes with the application of the covering law model or that of the instantiation of the causal law.

This is true to such an extent that – as WRIGHT observes – MACKIE converts the INUS test into a *but for* test, requiring that an INUS condition should be necessary for the occurrence of the event on a specific occasion, and introduces detailed arguments in favor of this latter test<sup>69</sup>.

Let us try to sum up.

The “pure” idea of cause does not exist, since the meaning of the word varies as the scientific sector under consideration varies, and varies if we pass from scientific language to ordinary speech<sup>70</sup>.

As a matter of principle, then, the idea elaborated by MACKIE cannot be considered the “true” idea of cause; furthermore, since the identification of the relevant notion of cause must reflect, indeed cannot help reflecting, the point of view of the researcher, MACKIE’s causal concept proves **useless** and **misleading** for the criminal judge. This latter is not in the least interested in knowing the sufficient cause, that is to say the sum of the necessary conditions. His attention must arrive at the realization that the harmful event is the consequence of a specific action (only in order to establish this may he – as we shall see – inquire into the sufficient cause). In short, the criminally relevant cause continues to coincide with the notion of the necessary condition<sup>71</sup>.

At this point, I have only to add a few considerations on MACKIE’s thought.

As we have seen, MACKIE’s doctrine revolves around the idea that regularity and causal laws are normally indispensable for the identification of the INUS condition<sup>72</sup>.

Furthermore, MACKIE claims that his theory is capable of explaining even single causal statements for which causal laws are not available: in these cases a causal model should be used based on “analogy and imagination”.

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<sup>68</sup> M. WEBER, *Gesammelte Aufsätze sur Wissenschaftslehre*, 1922.

<sup>69</sup> R. W. WRIGHT, *op.cit.*, p. 1023, note 113.

<sup>70</sup> Cf. F. STELLA, *Leggi scientifiche*, *op. cit.*, p. 52.

<sup>71</sup> An unacceptable interpretation of the meaning and the effect of the INUS condition is that demonstrated by O.DI GIOVINE, *Il contributo della vittima il reato colposo*, Turin, 2003, p. 308 et seq. and *ivi* the observation according to which MACKIE’s theories would prove “assonant” with the criminal law criteria of ascertaining the concomitant causes.

<sup>72</sup> Ved. *retro*, p. 15 et seq.

In this way, however, MACKIE paradoxically comes to align himself with C.J. DUCASSE—the isolated supporter of the concept defined as “singularist”, of decidedly pre-Humean inspiration. DUCASSE affirmed in 1926 that the causal relationship, on the basis of the intuitive meaning which ordinary language attributes to the idea of cause, must be formulated in terms of a “**single sequence**” of specific events and that the reference to “constancy of conjunction” is not a constitutive part of the idea of cause<sup>73</sup>.

The paradox is that MACKIE’s thought, as we have seen, is strongly aligned in its substance with the thesis of “regularity” and of the explanatory causal laws, and that he himself does not hesitate to criticize DUCASSE’s theses: “The causal relation suggested by DUCASSE cannot in itself serve as the foundation for causal inference: it could not be, ‘to us, the cement of the universe’<sup>74</sup>”.

In any case this is how, according to MACKIE, we should reason: the actual situation Y, in which both the “candidate condition” and the event itself took place, must be compared with an analogous actual situation X, in which neither the conditions nor the event occurred – “for example, the same situation prior to the occurrence of the candidate condition”.

Having made the comparison, the nonoccurrence of the event in situation X should ideally be transferred to “fill out the ‘**imaginative picture**’ in the counterfactual situation Y, which is constructed by hypothesizing that the candidate condition did not occur in Y”.

This “imaginative transfer”, according to MACKIE, “occurs without any reliance on causal generalizations”: recourse to it is “somewhat like having an **unconscious belief** that there is some underlying regularity in the world”, and would therefore imply the recognition that it is “only in these very tenuous senses that singular causal statements ... are implicitly general, that they necessarily assert or presuppose regularities **of any sort**”<sup>75</sup>.

The confutation of this “philosophical” argument is only too easy.

WRIGHT wonders: “What, other than an implicit causal generalization, would support the inference that the same (non) result would occur in the counterfactual situation, Y, as occurred in the actual situation, X?”. In what other way could the “imaginative transfer” take place?<sup>76</sup>

I have another argument to add to WRIGHT’s criticism.

Let us allow that, from a philosophical point of view, we can base ourselves on the “unconscious belief that there is some underlying regularity in the world”, but let us ask ourselves what would happen if judges were allowed to establish the causal link on the basis of their **unconscious** convictions. Philosophers, obviously, are not interested in the great juridical principles on which our contemporary legal systems are based, and perhaps MACKIE has never even heard of the legality-mandatory principle which precludes **precisely** that judges should be able to avail themselves of their more or less unconscious convictions and give free rein to their own reasoning, with recourse to the fantastic invention of imaginary pictures.

The truth is that this is not the first time that philosophy leads to conclusions divorced from the real world in which we live, and which often have no real sense.

The same thing has to be said of MACKIE’s other observation, according to which “the essential point is that singular causal statements are prior to general ones, whereas a regularity theory of the meaning of causal statements would reverse this priority”<sup>77</sup>.

In my investigation of 1975 I dealt with this problem in a way which seems to me irrefutable. I remarked: the judge finds himself facing a harmful event which constitutes a problematic situation for him; his problem is to identify the antecedent without which the event would not have happened; in order to do this, with a procedure which is normal in scientific

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<sup>73</sup> C. J. DUCASSE, *Truth, Knowledge and Causation*, London, 1968, Chapters 1-4, the first of which reprints an essay *On the Nature and the Observability of the Causal Relation* of 1926, quoted in MACKIE, op. cit., p. 134.

<sup>74</sup> J. MACKIE, *The Cement of the Universe*, op. cit., p. 141.

<sup>75</sup> Ved. R. W. WRIGHT, op. cit., pp. 1032-3, on MACKIE, op. cit., p. 79.

<sup>76</sup> Ved. R. W. WRIGHT, op. cit., p. 1032.

<sup>77</sup> Cf. J. MACKIE, op. cit., p. 80.

research, he formulates **hypotheses** on the relevance to the single case of a specific antecedent and a specific causal law; if the hypothesis proves founded, he will be able to select, among an infinite variety of antecedents, the antecedent which constitutes the necessary condition, and only then will he be able to formulate the single causal statement<sup>78</sup>.

The starting point for the judicial inquiry therefore consists, not of a causal statement, but of the harmful event which has occurred, an event which brings onto the stage, as a hypothesis to be verified, the regularity expressed by a causal law. This is what happens in the reality of judicial research: the single causal statement cannot be formulated at the beginning of the research; rather, it represents the final result. For the rest, it is pacific that priority does not go to the identification of the causal law: this was true also in examining the perspective outlined by ENGISCH, of which I have already demonstrated the erroneous nature<sup>79</sup>: Priority, after the observation of the event, belongs to the formulation of a hypothesis taking account both of the **relevance** of a certain antecedent as a necessary condition, and of the relevance and pertinence of a specific explanatory causal law.

Along the same lines, though with more plain arguments, WRIGHT observes that “in such circumstances the order is (1) observation of the occurrence, (2) adoption of the causal generalization based on the observation, and (3) assertion of causation through enunciation of the singular causal statement”<sup>80</sup>.

There is another consideration to be made. Discussing the “ontology” of causation, that is to say “causation as it is in objects”, MACKIE allows himself a first fundamental recognition: that it is undeniable that the theory of regularity has been accepted by scientists and laymen; his second recognition is that the only “plausible alternative” to causal laws might be represented by non-deterministic statistical laws which generate something approaching the regularities commonly observed and expressed by causal laws<sup>81</sup>.

But was it not MACKIE who affirmed that non-deterministic laws are unintelligible and mysterious<sup>82</sup>?

The truth is that MACKIE’s philosophy, while calling for further investigations into the causal problem, does not even graze the covering law model or that of the instantiation of the causal law.

2. *The NESS test: the analogy with the concept of cause proper of the natural sciences proposed by ENGISCH.* – Initially drawn up by HART and HONORÉ<sup>83</sup>, and analyzed by legal scholars and philosophers<sup>84</sup>, the NESS test was developed in all its implications and defended to the hilt by WRIGHT<sup>85</sup> as a criterion which should substitute the *but for* test and the necessary condition.

In spite of all WRIGHT’s efforts, however, even the NESS test proves **normally unusable** in criminal law.

I will explain my statement.

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<sup>78</sup> Cf. F. STELLA, *Leggi scientifiche*, op. cit., pp. 88 et seq., 101 et seq.

<sup>79</sup> Cf. F. STELLA, *Leggi scientifiche*, op. cit., pp. 88 et seq., 335 et seq.; also *Giustizia e modernità*, op. cit., p. 277 et seq.

<sup>80</sup> R.W. WRIGHT, op. cit., p. 1033.

<sup>81</sup> Cf. J. MACKIE, op. cit., pp. 80-81.

<sup>82</sup> Quoted in R. W. WRIGHT, op. cit., p. 1029, as well as FETZER, *Statistical Probabilities: Single Case Properties vs. Long-Run Frequencies*, in *Development in the Methodology of Social Science*, Dordrecht-London-Norwell-New York, 1974, pp. 387 et seq., 393-396.

<sup>83</sup> H.L.A. HART & T.HONORÉ, *Causation in the Law*, op. cit., pp. 105-110, 116-119, 122, 216-229.

<sup>84</sup> BEAUCHAMP-ROSENBERG, *Hume and the Problem of Causation*, New York-Oxford, 1981, pp. 212-213, 238; PAPINEAU, *Probabilities and Causes*, in *J. Phil.*, 1985, p. 55; SALMON, *Scientific Explanation and the Causal Structure of the World*, Princeton, 1984, p. 185-186; COOTER, op. cit., p. 257; KELMAN, op. cit., p. 602; MOORE, *Thomson’s Preliminaries about Causation and Rights*, in *Chi.-Kent L. Rev.*, 1987, p. 506; RIZZO, op. cit., pp. 1009-1016.

<sup>85</sup> R.W. WRIGHT, op. cit., p. 1018 et seq.

The NESS test stands for the *Necessary Element of a Sufficient Set*: “A particular condition was a cause of (contributed to) a specific result if and only if it was a necessary element of a set of antecedent actual conditions that was sufficient for the occurrence of the result”.

As can be seen, the test subordinates the requirement of necessity to that of sufficiency: this is what induced MACKIE to define the test as of weak necessity and strong sufficiency (the set which is only sufficient on a specific occasion may also be sufficient in any another occasion, while a condition can become necessary on a specific occasion without being so on all occasions).

The key to the understanding of the NESS test lies in the model of the instantiation of the causal law (the American model of the covering law model elaborated by WRIGHT): the causal law specifies the set of the **type** of sufficient conditions which are always followed by a result of a certain **type**; each condition is a constituent part of the set and is therefore a *necessary element*. The judge’s task is to verify whether there exists deterministic evidence of the instantiation both of the abstract conditions and of the abstract result and not whether, mentally eliminating the action, the result would or would not have occurred (the *but for* test).

Even at a first reading it can be understood that, in this way – even without knowing it – WRIGHT is re-proposing the concept of cause formulated by ENGISCH in 1931.

According to ENGISCH, as we know, the concept of a *sine qua non* condition is an “empty” concept since the research aimed at establishing whether, without the action, the result would not have occurred, presupposes that we already know, that we know “**beforehand**”, on the basis of other criteria, whether there exists a causal link between the action and the result. For this reason, the procedure of mental elimination should be **abandoned and substituted** by the procedure of the covering natural law model; and the *sine qua non* condition should be substituted with the concept of cause proper to the natural sciences.

ENGISCH defines his thought as follows: a) in order to verify the existence of the causal relationship, “it is necessary to see if it is possible to affirm, on the basis of natural laws, that the temporally successive events occurred *because* they were preceded by the action of the agent. If, for example, A and B contemporaneously shoot at C, but the latter is reached only by A’s bullet, it must be excluded that C’s death was conditioned by B’s action, since the natural laws do not connect death with the firing of a bullet which did not penetrate the victim’s body; b) saying ‘natural laws’ means reference to the natural law in the widest sense of the expression; a law which must be identified with the greatest possible precision and which translates into the formula: given V (an action of a certain *type*) + K (a set of circumstances of a certain *type*), that is following the criterion according to which F does not exist without V, given the premise of K; c) when proceeding to assess ‘conformity with the natural law’, all concrete, known and knowable *ex post* circumstances must be taken into consideration. If sufficient data is lacking to deliver a judgement (for example, a doctor performs an illegal operation on a pregnant woman, which is followed, at a certain distance of time, and coincidentally with a fall, by a miscarriage. In spite of the investigations carried out, it is in no way possible to establish whether, as a consequence of the doctor’s operation, a mutation occurred which led, in accordance with natural laws, to an abortion); a verdict of *non liquet* is obviously called for; d) when judging an actual case, recourse should normally be made to not one, but several natural laws combined. Thus, it is known that poisonous mushrooms are harmful or not to the health according to the physical ‘properties’ of those who eat them; or in an investigation into whether a car skidded as a result of a sudden breaking of the tires, numerous mechanical laws have to be considered”<sup>86</sup>.

In conclusion, for ENGISCH – as for WRIGHT – every action which is followed, according to a constant sequential link traceable in a causal law, by a harmful result, should be defined as causal.

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<sup>86</sup> K. ENGISCH, *Die Kausalität als Merkmal der strafrechtlichen Tatbestände*, Tübingen, 1931, p. 21 et seq.

3. *The NESS test as an unusable criterion, on a level with the concept of cause “proper to the natural sciences” for the criminal law.* – At this point, the NESS test runs into the same objections which can be made against the causal criterion proposed by ENGISCH.

The **substitution** of the *but for* test and the necessary condition with the NESS test or with the concept of cause proper to the natural sciences is simply **impossible**: how can we know “**beforehand**” the causal link between action and result? How can we identify “**beforehand**” the cause which “conforms” to the natural sciences? **On which antecedents** should we concentrate our attention? What are the “initial conditions” which should be listed by the covering law?

It is clear that there must be a criterion of **selection**, since, if there were not, any antecedent, among the infinite number of possible antecedents, could be taken into consideration as the object of some sort of covering law; it is equally clear that the criterion for selection can only be the “point of view” of the investigator.

Thus, in the case outlined by FEDERSPIL, that of subrenal tuberculosis contracted by a non-European citizen, it is necessary to select – if only as a hypothesis – the relevant cause from the point of view of the criminal judge: without this selection, it will not be possible to say whether the cause of the illness was proteic malnutrition or the Koch bacillus, or cohabitation with a sick person, or the poor ventilation of the room, or even the social condition which prevents an immigrant from receiving adequate medical care. Still less will it be possible to identify the cause in this set of conditions, because the judge is not interested in knowing for its own sake the set of causes which constitutes the sufficient cause: the judge’s task is solely to identify the antecedent to which the harmful result is to be attributed.

Analogous considerations can be made on the example of the road accident: the effective set of causes which gave rise to the sufficient cause consists of the poor road maintenance, defects in the braking equipment and the structure of one of the cars, and the state of anxiety of the two drivers. Here, too, a criterion for selection is needed, since there are as many causes as there are investigators. But which will be the criminally relevant cause?

The truth is that the criminal judge concentrates his attention **from the beginning** on the action of the agent, choosing it as the relevant antecedent, separating it from the infinite number of antecedents of the event: in doing this, the judge attempts to fulfill his task, which is to understand whether liability for the event can be attributed to the agent’s action, that is to say, **whether the event would not have taken place without his action**. Once the relevant antecedent from the point of view of criminal law has been identified, the judge asks himself whether it can be “covered” by one of the “initial conditions” contemplated by a specific “law of nature”; if the answer is affirmative, we can say that he has verified, in compliance with the covering law model, that the agent’s action was a *sine qua non* condition for the event: each of the “initial conditions” to which the natural law refers is in fact – when it is instantiated – a condition, a necessary condition, for the event<sup>87</sup>.

This, then, is the reason for which ENGISCH and WRIGHT cannot be followed when they affirm that the existence of the causal link must be known “**beforehand**”, and this is the reason for which it is not possible to substitute the idea of the necessary condition: science, alone, **does not help us** in any way to grasp the penal relevance or irrelevance of a specific antecedent; and the covering law model cannot be understood as a “naked” model, that is to say, detached from its use of a **criterion of relevance** which reflects the specific point of view of criminal law.

The picture is completed if we consider that, for ENGISCH himself, the *sine qua non* condition conceals a **specifically juridical** point of view. A harmful event takes place: there arise immediately – says ENGISCH – sorrow, anger and disapproval and we think at once: “but if this or that had not happened, the event would not have taken place”<sup>88</sup>.

A confirmation of the **specifically juridical** aspect of the *sine qua non* condition and the *but for* test is provided by their use in almost all countries of the world.

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<sup>87</sup> STELLA, *Leggi scientifiche*, op. cit., pp. 88 et seq., 355 et seq., and *Giustizia e modernità*, op. cit., p. 277 et seq.

<sup>88</sup> ENGISCH, *Vom Weltbild des Juristen*, Heidelberg, 1965, p. 133.



In almost all European penal systems, first of all: in **Germany** the theory of the *sine qua non* condition or that of equivalence of the conditions – elaborated in 1873 by VON BURI – is “generally accepted” today as the basic criterion for penal imputation in causation-oriented trials<sup>89</sup>, and it is taken for granted that any other causal theory (such as the theory of sufficient causation) and any other objective criterion of relevance (such as the criterion of increased risk) presupposes “at least” the existence of a condition which cannot be mentally eliminated without the event itself failing to take place<sup>90</sup>.

The same situation is to be found – just to mention the major European countries – in the United Kingdom, France, Spain and Italy.

In the **United Kingdom** the use of the *but for* test is “generally accepted” in doctrine and in jurisprudence<sup>91</sup>. This is also testified by the textbooks and manuals of the 1990s: “The conduct of the defendant” – it is specified – “must be a *sine qua non* of the forbidden consequence. In other words, it must be established that the consequence would not have happened *but for* the conduct of the defendant”<sup>92</sup>; “The first stage of causation” – it is further stated – “is primarily a question of historical mechanisms (given that it necessarily implies what would have happened in different circumstances): without the action of the defendant, would the damage have taken place?”<sup>93</sup>; “The question ‘did X contribute to making Y happen?’” – yet again – “may seem perfectly factual, a mere question of history, but in reality it means ‘Y would not have happened without X’ (...). This is in line with the traditional all-or-nothing approach of *common law*”<sup>94</sup>.

Also in **France** and **Spain** it is considered pacific that the *sine qua non* condition constitutes the basis for the imputation of criminal liability for harmful events.

According to French scholars, it is sufficient to answer this question: “Was the violation of the criminal law the *sine qua non* condition for the result? In other words, in the absence of these infringements, would the result have been produced in the same way? (...). Here we recognize the famous postulate of the equivalence of the conditions (...). The notion of the *sine qua non* condition is in reality common to all theories of causation”<sup>95</sup>.

For Spanish criminologists, “with the triumph of conditionalistic theory the meaning of the causal problem, for criminal law, has become relative (...). The existence of causation continues to be an **indispensable** requirement in all criminal law cases: in crimes of danger, it is so because the configuration of the case requires that the defendant has caused (conditioned) the risk. In crimes of damage, the causal requirement is unavoidable because these latter presuppose the demonstration that the defendant has caused (conditioned) the harm to persons or effects, since it is not sufficient to prove that his conduct has created a risk (...). The conclusion is that the causal link, understood as the conditioning link, continues to be a **fundamental element** of the law models, simply because both crimes creating danger and crimes resulting in harm require the demonstration that the conduct of the defendant has conditioned the type of result (whether damage or danger) in the external world”<sup>96</sup>.

In **Italy** both case law and doctrine widely agree in recognizing that the criterion of the *sine qua non* condition, or the equivalence of the conditions, has been codified in Articles 40 and 41, paragraph 1, of the Penal Code.

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<sup>89</sup> Cf., inter alia, MAIWALD, *Kausalität und Strafrecht*.

<sup>90</sup> Among manuals, cf. JESCHEK-WEIGEND, *Lehrbuch des Strafrechts, Allgemeiner Teil*, Berlin, 1996, p. 279 and other references *ivi*.

<sup>91</sup> Civil law doctrine is aligned with that of criminal law: ved., inter alia, ALLEN, *Textbook on Criminal Law*, 4th edition, London, 1999; ROGERS, *Winfield and Jolowicz on Tort*, 15th edition, London, 1998; WEIR, *A Casebook on Tort*, 8<sup>th</sup> edition, London, 1996.

<sup>92</sup> ALLEN, op. cit., p. 33.

<sup>93</sup> ROGERS, op. cit., p. 195 et seq.

<sup>94</sup> WEIR, op. cit., p. 223.

<sup>95</sup> Cf., inter alia, MERLE-VITU, *Traité de droit criminel*, Paris, 1973, p. 552.

<sup>96</sup> GIMBERNAT-ORDEIG, *Causalidad, omisión e imprudencia*, in *El Derecho penal hoy. Homenaje al professor David Baigún*, Buenos Aires, 1995, pp. 193 et seq., 196.

But it is not only in European countries that doctrine and jurisprudence recognize the **fundamental role** of the *sine qua non* condition as a **basic criterion for the imputation of the event**.

On the other side of the ocean, in the **United States** – the country where, more than in any other, doctrine and (civil) case law have been involved in the discussion of causation, above all with reference to the *Law of Toxic Torts* – the *Model Penal Code* establishes that “Conduct is the cause of a result when: a) it is an antecedent **but for which the result in question would not have occurred**; and b) the relationship between the conduct and the result satisfies any additional causal requirements imposed by the Code or by the law defining the offense”<sup>97</sup>.

Also the final document of the *National Commission on Reform of Federal Criminal Laws* of 1967, following the draft prepared by the Brown Commission, states, in paragraph 305, the rule according to which “causation may be found **where the result would not have occurred but for the conduct of the accused**, operating either alone or concurrently with another cause, unless the concurrent cause was clearly sufficient to produce the result and the conduct of the accused clearly insufficient”<sup>98</sup>.

And mark well: a fair number of States (Arizona, Delaware, Hawaii, Kentucky, Montana, Pennsylvania, New Jersey, Tennessee, West Virginia) have emanated laws based precisely on section 2.03 of the *Model Penal Code*; another group of States (Arkansas, Maine, North Dakota, Massachusetts, Vermont) have inserted in their own legislation rules based on the Federal Commission document; other States, in conclusion, (Alabama and Texas) have combined the provisions of the *Model Penal Code* section 2.03 with the rule recommended in the Federal Commission document<sup>99</sup>.

But in the *common law* countries the explicit adhesion, via laws, to the regulation pronounced in the *Model Penal Code* or by the Federal Commission can be considered superfluous; in fact, *common law* case law, in its centuries-long evolution, has always been strongly anchored – and today remains even more so – to the *but for* test or the *sine qua non* condition.

It would be an enormous and pointless task to list all the opinions of the Courts of the United States which refer to the *but for* cause: it is enough to remember that still today the vast majority of the Courts continue to repeat, even on the terrain of **civil law**, the very high value of the *but for* test as the basic criterion for the attribution of causal liability.

I will recall only a few of the more recent sentences.

For the Supreme Court of Montana (1973), “The test most generally employed in determining causation is the ‘*but for*’ test (...). Proximate cause is one ‘which in a natural and continuous sequence, unbroken by any new, independent cause, produces the injury, and **without which the injury would not have occurred**’”<sup>100</sup>; for the Supreme Court of Arizona (1983), “Therefore, as far as causation-in-fact is concerned, the general rule is that a defendant may be held liable if his conduct contributed to the result and if that result would not have occurred ‘*but for*’ defendant’s conduct”<sup>101</sup>; for the Arizona Court of Appeals (1991), “One element of legal cause is ‘*but-for* causation’ or causation in fact”<sup>102</sup>; for the Supreme Court of Missouri (1993), “The ‘*but*

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<sup>97</sup> *Model Penal Code* Section 2.03 (1).

<sup>98</sup> *National Commission on Reform of Federal Criminal Laws*, 1967, § 305.

<sup>99</sup> The following laws can be compared: Arizona § 13-203, Delaware tit. 11 §§ 261-263, Hawaii from §§ 702-214 through 217, Kentucky § 501.060, Montana § 94-2-105, New Jersey § 2C-3, Pennsylvania tit. 18 § 303, Tennessee (p) § 407, West Virginia (p) § 61-2-6, Arkansas § 41-205, Maine tit. 17-A § 56, North Dakota § 12.1-02-05, Massachusetts (p) ch. 263 § 20, Vermont (p) § 1.2.12, Alabama § 13A-2-5, Texas § 6.04.

<sup>100</sup> *Brandenburger v. Toyota Motor Sales, U.S.A., Inc.*, 513 P.2d 268 (1973), which recalls *De Verniero v. Eby*, 496 P.2d 290, 293 (Supreme Court of Montana, 1972). Similarly *Sztaba v. Great Northern Railway Company*, 147 Mont 185, 195, 411 P.2d 379, 385 (Supreme Court of Montana, 1966): “The test most generally employed in determining causation is the ‘*but for*’ test. Montana has adopted this test in numerous cases. (...) At most, the ‘*but for*’ or ‘*sine qua non*’ test is one of exclusion. In other words, the defendant’s conduct is not the cause of the event, if the event *would* have occurred without it”.

<sup>101</sup> *Ontiveros v. Borak*, 136 Ariz. 500, 505, 667 P.2d 200, 205 (1983).

<sup>102</sup> *Rogers By and Through Standley v. Retrum*, 825 P.2d 20 (1991).

for' causation test provides that the defendant's conduct is a cause of the event if the event would not have occurred 'but for' that conduct"<sup>103</sup>; for the Washington Court of Appeals (1995), recalling two sentences of the Supreme Court of Washington, "A cause in fact is a cause **but for** which the accident would not have happened (...). A cause is 'proximate' only if it is *both* a cause in fact and a legal cause"<sup>104</sup>; for the Missouri Court of Appeals (1995), "In considering whether plaintiff established causation in fact, we apply the 'but for' test (...). Under this test, plaintiff must prove that the injury would not have happened but for defendant's conduct"<sup>105</sup>; for the 8<sup>th</sup> Circuit Court of Appeals (1998), "To establish the necessary causal connection, appellants must prove both causation in fact ('but for' causation) and proximate causation (...). 'But for' causation is an **absolute minimum** because it establishes causation in fact"<sup>106</sup>.

The recourse by the courts to the *sine qua non* condition, or *but for* test, has obviously been the object of comments and studies by all those who deal with causation in **civil** law doctrine. Scholars agree in observing as follows: "The most widely used test of actual causation (...) is the but-for test, which states that an act (active or of omission) was the cause of an injury if and only if, but for the act, the injury would not have occurred. That is, the act must have been a **necessary condition** for the occurrence of the injury. The test reflects a **deeply rooted faith** in the fact that a condition cannot be the cause of an event unless it is, in some sense, necessary for the occurrence of this event. This view is shared by **legal scholars, philosophers, scientists**, and the **general public**"; "Regardless of the theory of recovery employed, the exposure victim has to establish, with varying degrees of difficulty, that the defendant's conduct was a cause-in-fact of the plaintiff's injury"<sup>107</sup>; "But for causation or cause in fact, which reflects commonly held assumptions about causation as well as certain **moral and political** notions of responsibility, tends to **dominate** the disposition of tort claims"<sup>108</sup>; "Most courts have continued to insist on "but for" or "sufficient" causes and have refused to accept the probabilistic evidence upon which physicians and scientists have long relied in understanding disease and treating patients"<sup>109</sup>; "If damage to the plaintiff would not have occurred 'but for' the defendant's negligence then the negligence is *a* cause of the damage (...). Putting this another way, if the loss would have occurred in any event, the defendant's conduct is not a cause"<sup>110</sup>.

With specific reference to the *but for* cause, I wish to recall my previous observations on the tendency of the courts to consider causation proven only when there is proof of "causal chains", that is to say when "the causal process consists of a series of single events each of which is dependent upon (would not have occurred without) its predecessor in the 'chain' and so is dependent upon the initiating action or event"<sup>111</sup>.

In other words, in the dominating point of view of the *common law* courts, the *but for* cause, the *sine qua non* condition, assumes a meaning which coincides with that of the reconstruction of the causal chains; and it is for this reason that the courts are induced not to recognize the relevance of so-called probabilistic causation or statistical proofs.

This is recognized by all legal doctrine, which loses no occasion to underline that, according to the courts, "one knows something only when a mechanistic causal chain is identified, and

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<sup>103</sup> *Callahan v. Cardinal Glennon Hosp.*, 863 S.W.2d 852, 862 (1993).

<sup>104</sup> *Channel v. Mills*, 890 P.2d 535, 538 (1995). The sentence recalls *Christen v. Lee*, 113 Wash.2d 479, 780 P.2d 1307 (Supreme Court of Washington, 1989) and *Baughn v. Honda Motor Co.*, 107 Wash.2d 127, 727 P.2d 655 (Supreme Court of Washington, 1986).

<sup>105</sup> *Paull v. Shop 'N Save Warehouse Foods, Inc.*, 890 S.W.2d 401, 403 (1995).

<sup>106</sup> *Chism v. W.R. Grace & Co.*, 158 F.3d 988, 991 (1998).

<sup>107</sup> R.W. WRIGHT, *Causation in Tort Law*, op. cit., 1985, p. 1775; R.O.HARRIS, *Toxic Tort Litigation and the Causation Element: is there Any Hope of Reconciliation?* in *Southwestern L. Review.*, 1986, p. 911.

<sup>108</sup> T. BRENNAN, *Causal Chains and Statistic Links*, op. cit., p. 490; BOSTON-MADDEN, *Law of Environmental and Toxic Torts*, St. Paul, Minn., 1994, p. 340 et seq.

<sup>109</sup> T. BRENNAN, op. cit., p.494 et seq.

<sup>110</sup> JONES, *Medical Negligence*, London, 1996, p. 263.

<sup>111</sup> T. BRENNAN, op. cit., p. 485.

statistical inferences do not contribute to such knowledge. Courts want but for causes from science – causes that **bear directly on the individual**<sup>112</sup>. In effect, there are no few sentences which, as we shall see, are emblematic in this sense: “Expectancy or statistical data about a group” – observe the North-American Justices – “do not establish **concrete facts about an individual** (...). An attempt to make what is at best a sheer guess more precise by introducing another uncertain factor is not apt to prove the accuracy of a calculation. Thus, courts have been willing to reject probabilistic evidence, even when that evidence exemplifies the hypothesis creation and observation that now form the basis of scientific research. Courts do not expect discussion of uncertainty from science; they want **causal chains** that lead to but for causes”<sup>113</sup>.

United States case law and legal doctrine have therefore always recognized the crucial importance of the *but for* cause **even on the terrain of civil law**. So much the more crucial is it, then, for criminal law, since this nation is proud to declare itself – as numerous sentences of the Supreme Court testify – a “free society” which attributes a **very high value to liberty**, which does not wish to run the risk of convicting innocents and which, for this reason, is not willing to sacrifice the good name, the reputation and the freedom of an individual if it has not been demonstrated that it was really the accused who was responsible for the event, and that the harmful event would not have occurred “but for him”.

4. *The contingently necessary condition in the context of a sufficient condition.* – The necessary condition is still a dominating concept: it corresponds more than any to the needs of criminal law and more than any other allows the criminal judge to formulate the initial hypothesis on which can be measured the concrete applicability of the covering law model, whether Italian or American.

In order to avoid being misunderstood, I must however point out that – as JOHN STUART MILL has already observed – a certain event may be the consequence of a plurality of sufficient causes. Precisely for this reason, every necessary condition is to be defined as a “**contingently**” necessary condition, relating that is to say to the contingency of the context of the sufficient cause being considered: this serves to clarify that the condition is **not necessary in an absolute sense**, but only in a specific context.

This subject has been investigated by me in an essay of 1988 and in subsequent essays<sup>114</sup>. My conclusions – subsequently adopted by the Supreme Court<sup>115</sup> – were as follows:

- a man’s conduct (let us call it C1) cannot help being one of the many necessary conditions for the event: from a logical point of view the cause cannot help being understood as the set of necessary conditions (C1, C2, ..., Cn), that is to say as a sufficient condition; from the point of view of criminal law, the concept of cause does not coincide with that of the sufficient condition but with that of the necessary condition<sup>116</sup>;

- human conduct (C1) is never a necessary condition in an absolute sense, but it is so **contingently**, that is to say in a specific context of concrete conditions (C1, C2, ..., Cn); since it is not possible to grade the “weight” or the efficiency of each single condition, all conditions contingently indispensable for the occurrence of the event are equivalent amongst themselves and equally causal (Art. 41, paragraph 1 of the Penal Code; the principle of the equivalence of the conditions)<sup>117</sup>.

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<sup>112</sup> Thus T. BRENNAN, op. cit., p. 493. On this same point ved. also R. HARRIS, op. cit., p. 911, BOSTON-MADDEN, op. cit., p. 339 et seq.

<sup>113</sup> T. BRENNAN, op. loc. citt.

<sup>114</sup> F. STELLA, *La nozione penalmente rilevante di causa*, op. cit., in *Leggi scientifiche e spiegazione causale nel diritto penale*, 2nd edition, op. cit., p. 327 et seq. Ved. also *Giustizia e modernità*, op. cit., p. 271 et seq.

<sup>115</sup> Cf. Cass. pen., sez. IV, 6.12.1990, imp. Bonetti, in *Foro it.*, 1992, II, p. 36 et seq. and *Cass. pen.* 1992, p. 2726, as well as, more recently, Cass. pen., sez. IV, 25.9.2001-13.2.2002, no. 1652, imp. Covilli, in *Riv. it. dir. proc. pen.*, 2002, p. 737 with a note by F. D’ALESSANDRO.

<sup>116</sup> F. STELLA, *Leggi scientifiche*, op. cit., p. 329 et seq.

<sup>117</sup> F. STELLA, *Leggi scientifiche*, op. cit., pp. 98 et seq., 348 et seq., 392 et seq. and further references *ivi*; ROMANO, *Commentario sistematico del codice penale*, 1, 3rd ed., Milan, 2004, p. 365 et seq.; FIANDACA-MUSCO, *Diritto*

In view of these considerations, it proves **impossible** to accept the idea that the necessary condition must be substituted *in toto* by the NESS test, a test of “strong sufficiency” and “weak necessity”: strong sufficiency means that the necessary condition is subordinated to the sufficiency of the overall set of conditions, a set identified in its turn on the basis of the **type** of sufficient **abstract** conditions listed by the causal law. The ascertaining of the necessary condition should therefore take place, in this perspective, not through mental elimination of the **concrete** antecedent (that is to say by asking oneself, as in the *but for* test, whether, without the *concrete* antecedent, the event would not have occurred) – or rather, not by using the concept of a contingently necessary condition<sup>118</sup> - but on the basis of its coverage by the necessary **abstract** condition which constitutes the sufficient **abstract** condition.

I will explain this with an example to which I shall shortly return.

Two fires, set off on opposite sides of a house, destroy it totally: applying the notion of the contingently necessary condition for the concrete harmful result, we must conclude that, eliminating mentally one of the two fires, the destruction of the house would have equally been brought about by the other. We therefore find ourselves facing the well-known problem of duplicative causation. This problem would not even have arisen within the perspective of the NESS test, since each of the two fires would be a NESS condition, due to the fact that either one of them belongs to the abstract category of the necessary conditions which constitute the abstract sufficient condition.

But this is precisely the point: the judge is dealing with real events, with actual antecedents and actual results; this means that the procedure of mental elimination has, as a general principle, the actual antecedent and the actual result as its poles of reference. Then it must be wondered how these observations can be reconciled with the application of the NESS test.

We shall see in the next section how to get an answer to this question.

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*penale, parte generale*, Bologna, 1995, pp. 198, 215 et seq.; PAGLIARO, *Principi di diritto penale, parte generale*, Milan, 2000, p. 347 et seq.; ANTOLISEI, *Manuale di diritto penale, parte generale*, Milan, 1997, p. 235 et seq.; MANTOVANI, *Diritto penale*, Padua, 1992, pp. 176, 186. For German doctrine, *inter alia*, JESCHEK-WEIGEND, *Lehrbuch des Strafrechts*, Berlin, 1996, p. 277 et seq. For jurisprudence, cf. Cass., sez. IV, 17.12.1993, in *Riv. pen. ec.*, 1996, p. 56 et seq.

<sup>118</sup> In a later essay than that of 1988, *Once More into the Bramble Bush: Duty, Causation, Contribution and the Extent of Legal Responsibility*, op. cit., p. 1072 et seq., WRIGHT newly formulates his thought. This is what he says: “The NESS test is a refinement and further development of the concept of a causally relevant condition that was first proposed in 1959 by Herbert Hart and Tony Honoré. As Hart and Honoré noted, the core concept of (empirical) causation that we all employ conforms with, and is explained by, the regularity account of causation that was first elaborated by David Hume and subsequently modified by John Stuart Mill. Hume revolutionized philosophic thinking on causation when he insisted, contrary to the then-popular belief, that singular causal judgments are not based on direct perception of causal qualities or forces inherent in objects or events. No such perceptible quality or force has ever been identified. Instead, causal judgments are based on the belief that a certain succession of events fully instantiates one or more causal laws or generalizations, which in turn are induced from empirical observation and experimentation. A causal law would list in the antecedent (the “if” part of the causal law) all of the conditions that together are sufficient for the occurrence of the consequent (the “then” part of the causal law). A causal generalization is an incompletely described causal law. To avoid including causally irrelevant conditions in the antecedent, the conditions included in the antecedent must be restricted to those that are necessary for the sufficiency of the antecedent. Thus the necessity requirement is subordinate to the sufficiency requirement. To this Humean analysis, Mill added the observation that there may be a plurality of distinct sets of conditions that are each sufficient to produce the consequent, both in general and on a particular occasion, so that there is no unique sufficient set. This basic concept of causation is formalized in the NESS (necessary element of a sufficient set) test of causal contribution, which, in its full form, states that a condition contributed to some consequence if and only if it was necessary for the sufficiency of a set of existing antecedent conditions that was sufficient for the occurrence of the consequence. The relevant notion of sufficiency is not merely logical or empirical, but rather requires that each element of the applicable causal generalization, in both the antecedent (“if” part) and the consequent (“then” part) must have been in actual existence (concretely instantiated) on the particular occasion”. (WRIGHT, *Once More into the Bramble Bush*, op. cit., p. 1102-1103).

## SECTION III

### *The superfluous nature of the NESS test and the INUS conditio for the criminal law.*

1. *The description of the event.* – The NESS test, like the INUS condition, is a “naked” test which cannot be applied (outside the cases which I shall examine shortly) because it lacks the necessary selective criteria. But the NESS test shares the fate of the INUS condition under another aspect, too: it was born to resolve the problems of preemptive causation and duplicative causation, which can instead be resolved on the very different field of the description of the event.

The description of the event is one of those themes which demonstrates just how difficult a goal the homogenization of cultures is to reach even in our own times: scholars from the Anglo-Saxon world such as WRIGHT and MACKIE have ventured into the area of duplicative causation and preemptive causation without even realizing that this was a field long ploughed by European scholars (see the summary provided by me in *La descrizione dell'evento*, of 1970).

Scarcely trained to deal with the problems connected with the description of the event, both WRIGHT and MACKIE give answers to the interrogatives posed by preemptive causation and duplicative causation which are largely unsatisfactory.

I will explain the reasons of my criticism.

2. *The description of the event in the thought of WRIGHT and of MACKIE.* – First of all, we have to give the necessary definitions. With the expression “preemptive causation” we refer to substitutive factors the efficiency of which has remained hypothetical but which, in the absence of the illicit conduct under consideration, would certainly have led to the occurrence of the event. With the expression “duplicative cause”, on the other hand, we commonly refer to situations in which the occurrence of the actual event was determined by a combination of several factors<sup>119</sup>.

WRIGHT gives the following examples of preemptive causation: 1) two fires, fire X and fire Y, set off independently of one another on two different sides of the house; fire Y reaches the house, but only after it had already been reached by fire X, which has completely destroyed the building (the example is taken from HART and HONORÉ); 2) an enemy poisons the water-can of a traveler crossing the desert, but another enemy, unaware that the water has been poisoned, empties the water-can before the traveler drinks the poison, so that the traveler dies of thirst instead of by poisoning (the example is taken by MACKIE from HART and HONORÉ).

According to WRIGHT, by applying the *but for* test we would reach the inadmissible conclusion that no one is liable either for the fire or for the death of the traveler, because these two events would have taken place in any case as a result of the substitutive factor, represented respectively by fire Y and by the poison introduced into the traveler's water-can. Every difficulty would be removed, on the other hand, by applying the NESS test: only the fire which reached the house first and the mortal thirst of the traveler would constitute the necessary conditions of a sufficient set, while the fire which reached the house later and the poison introduced into the water-bottle would constitute the conditions of an insufficient set<sup>120</sup>.

The argument implies that the relevant event is described in an **abstract** manner, that is to say it is identified in the type of event described by the law: the causal law relevant to the case under consideration specifies the **abstract** conditions which, taken together, form the sufficient **abstract** condition and refer to an event which is also **abstract**, a **type** of event.

With this premise, WRIGHT has an easy task to demonstrate that, in the two cases being considered of the fire and the water-can, the abstract conditions and the abstract event specified by the causal law were instantiated only in the case of fire X and of the traveler's death by thirst. But the question is: can the criminally relevant event be identified by reference to the **abstract** event

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<sup>119</sup> Cf. F. STELLA, *La descrizione dell'evento*, Milan, 1970, pp. 6 et seq., 78 et seq.

<sup>120</sup> On “duplicative causation” and “preemptive causation” ved. R.W. WRIGHT, *Causation, Responsibility ...*, op. cit., pp. 1018-1024.

foreseen by the law? We shall shortly see the reasons for which, **by law**, the judge cannot be satisfied with such a description.

MACKIE, on the other hand, proposes a solution which gives as demonstrated that which is to be demonstrated: according to the philosopher, the *but for* test would keep its validity, since a condition must be held necessary for the production of the event “as it came about”. In other words, the emptying of the can should be considered a cause of the traveler’s death, since it represents a necessary condition for his death as it came about: by thirst rather than by poisoning<sup>121</sup>.

As WRIGHT observes, in this way we end up with a genuine tautology: “to include how the result came about in the description of the result is to assume an answer to the causal issue before it is posed”. “The causal process which is believed to be at work” – in other words – “is incorporated in the description of the injury”: “Under this method, it can be proven that **any** condition was a cause of the injury”, simply by including it in the description of the injury “as it came about”. But why, asks WRIGHT, should the traveler have died by thirst rather than by “gazing at the moon?”<sup>122</sup>.

WRIGHT is correct, but his mistake – if mistake it can be called – lies in not having understood the central role which the description of the event has for the solution of the problem. In any case, his clash with MACKIE is frontal: for WRIGHT, the relevant event is the abstract event; for MACKIE it is the actual event described in all its modalities, including those relevant to the causal process.

It is this contrast which induces me to return to certain investigations into the theme completed by me in *La descrizione dell’evento* and subsequently in *Leggi scientifiche e spiegazione causale nel diritto penale*.

3. *The European Literature on the description of the event* – The two contrasting theses were known in Europe many years before WRIGHT’s and MACKIE’s studies.

a) As early as 1905, VON LISZT wrote that the event “must be considered in all its materiality. It is not important to ascertain whether B would have died without A’s action, but whether B would have died in that day and in that way”<sup>123</sup>; in 1930, ANTOLISEI stated that the causal relation “exists if the action only hastened the occurrence of the event, or if it contributed to the extent or the manner in which the result occurred”<sup>124</sup>; MEZGER repeated that “the event is to be considered only in its effective and actual form, and therefore in **all** its particular modalities”<sup>125</sup>; M.L. MÜLLER stated the thesis according to which the actual event must indeed be generalized in compliance with the indications of the law, but its description must include “the intermediate causal links”<sup>126</sup>.

In my essay *La descrizione dell’evento* I underlined the reasons which prove incontrovertibly the unfounded nature of these theses.

This is what I wrote on the actual modalities of the event.

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<sup>121</sup> J. MACKIE, op. cit., pp. 44-46.

<sup>122</sup> R.W. WRIGHT, op. ult. cit., p. 1025 and note 129.

<sup>123</sup> VON LISZT, *Lehrbuch des deutschen Strafrechts*, 1905, p. 126.

<sup>124</sup> ANTOLISEI, *Il rapporto di causalità nel diritto penale*, rep., Turin, 1960, p. 46. Later, on p. 260, ANTOLISEI states: “The reader will not find it difficult to realize this necessity, considering that, otherwise, with regard to murder, the existence of the causal relation would always have to be denied. Given, in fact, that all men are mortal, if the investigator did not place the event before his eyes as it happened in the particular case (that is to say, the man’s decease at that time, in that place and in that manner) he would always have to conclude that, even without the criminal action, the victim would have died. However, saying that the event must be considered in its actual form, does not mean that all details of it, even secondary ones, must be noted. The observer’s interest always has a decisive weight in the consideration of phenomena of nature, and thus the legal scholar neglects, and must neglect, those circumstances which have no value for the law. It seems to me that no more can be said. The last word here belongs to the common sense of the judge: a general rule is not possible”.

<sup>125</sup> MEZGER, *Strafrecht, ein Lehrbuch*, 1. Aufl., München-Leipzig 1931 (2. Aufl. 1933, 3. Aufl. 1949), p. 135.

<sup>126</sup> MÜLLER, *Die Bedeutung des Kausalzusammenhanges im Straf- und Schadensersatzrecht*, Tübingen, 1912, p. 10 et seq.

It may be, first of all, that the actual event is characterized by modalities which are, so to speak, accessory, the irrelevance of which would seem to be unquestionable: having painted a vase which breaks into pieces, for example, cannot be considered a *sine qua non* condition for the event; yet, if the vase had not been painted, the result would be different, since the fragments lying on the ground would be unpainted, not painted<sup>127</sup>.

In other cases, then, we may witness an action, the effects of which would seem intuitively to be irrelevant, even though it took place “in the direction covered by the law”: in the example of the “flood”, the action of a person who pours into a stream of water the contents of a small jar of water cannot, obviously, be considered a *sine qua non* condition for the “result”, even if it can be said that the latter, without the introduction of the water, would have had slightly different dimensions<sup>128</sup>.

But, one might say, little harm is done if a few concrete details have to be omitted from the description: what matters is that the event should be described in all its relevant aspects or, as RÜMELIN put it, in those aspects which might interest a common observer<sup>129</sup>. Little harm is done, certainly: on the condition, however, that vague affirmations of principle are set aside and that the circumstances which an impartial observer would take into consideration are specified. Modifying the example of the “flood”, one might think of the introduction of a thousand, ten thousand, a hundred thousand, a million cubic meters of water: in which of these cases can it be said that, without the agent’s action, the flood would have been different? We get the impression, in short, that, moving from a *purely* concrete consideration of the event, the distinction between relevant or irrelevant circumstances cannot be of any help; we risk ending in a blind alley, at the mercy of a formula with excessively fluctuating confines<sup>130</sup>.

At this point, those who wish to be faithful to the “concrete description model” could be tempted to affirm, with MEZGER, that from a causal point of view all modalities of the event, however insignificant, are relevant<sup>131</sup>.

Formulated in these terms, however, the thesis would be exposed to an even more drastic confutation: it is difficult not to agree with those who affirm that every judgment of “existence” is inconceivable without a choice, without operating a **selection**<sup>132</sup>. Even a merely historical reconstruction is necessarily selective<sup>133</sup>: and “... it is the code of human interest, in the widest sense of the word, which points the eye of the historian more towards this than towards that aspect of the event, inducing him to prefer one reconstruction among the many possible

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<sup>127</sup> TRAEGER, *Die Kausalbegriff in Straf-und Zivilrecht*, Marburg, 1904, p. 41.

<sup>128</sup> TRAEGER, *op. loc. cit.*; SPENDEL, *Die Kausalitätsformel der Bedingungstheorie für die Handlungsdelikte* (Dissertation), Heidelberg, 1948, pp. 75, 76. In the opinion of ENGISCH, too, in *Die Kausalität als Merkmal der strafrechtlichen Tatbestände*, *op. cit.*, pp. 11-12, “the tiny quantity of water introduced in the current no more represents a causal factor for the flood, than does a cork in the sea”.

<sup>129</sup> RÜMELIN, *Die Verwendung der Kausalbegriffe in Straf-und Zivilrecht*, in *Arch. ziv. Pr.*, 90, p. 112.

<sup>130</sup> TRAEGER, *op. loc. cit.*

<sup>131</sup> MEZGER, *Strafrecht*, p. 135.

<sup>132</sup> It is not necessary to indulge in an excess of bibliographical references: cf., for logic, DEWEY, *Logic, the Theory of Inquiry*, New York, 1938, p. 221 (“no mere flux can be noted, appraised or estimated”) and, above all, NAGEL, *The Structure of Science*, cap. XV.; for historiography, WEBER, *Gesammelte Aufsätze sur Wissenschaftslehre*, *op. cit.*, cap. XV (“To history pertains only the causal explanation of those ‘elements’ and those ‘aspects’ of the event in question which are possessed under a specific viewpoint of a ‘universal meaning’ and thus a historical interest ...”); for law, CALOGERO, *La logica del giudice e il suo controllo in Cassazione*, Padua, 1964.

<sup>133</sup> DEWEY, *op. cit.*, p. 317 et seq.: “Since the past cannot be reproduced *in toto* and lived over again, this principle might seem too obvious to be worthy of being called important. But it is of importance because its acknowledgement compels attention to the fact that everything in the writing of history depends on the principle used to control selection. This principle decides the weight which shall be assigned to past events, what shall be admitted and what omitted; it also decides how the facts selected shall be arranged and ordered”. And, again, “The selection is as truly logical a postulate as are those recognized as such in mathematical propositions ... As soon as the event takes its place as an incident in a particular history, an act of judgment has loosened it from the total complex of which it was a part, and has given it a place in a new context, the context and the place both being determinations made in inquiry, not native properties of original existence”.



reconstructions”<sup>134</sup>. For the legal scholar, the heuristic criterion is offered by the law, and the separation between the existing and the relevant, on which MEZGER insists, – to deduce, for example, that the man who pours a jar of water in the current creates a necessary condition for the actual flood, but not one that is legally relevant, such as might be punished<sup>135</sup> – is nothing but a verbal expedient, an attempt to introduce the unacceptable idea of a judgment of existence reached without the support of any criterion whatever. The truth is that only empirically can it be affirmed that the judge should assess the natural event first as extant and then as relevant; in reality an “extant” event is already a “relevant” event, an event categorized according to regulatory criteria<sup>136</sup>: “the judgment of fact implicitly presupposes, as a heuristic principle, the judgment of law which should follow it”<sup>137</sup>.

As to MÜLLER’s thesis, I had no difficulty in remarking that the insertion of intermediate causal links in the description of the event is nothing but a flagrant tautology (which gives as proven that which is to be proven), the same tautology into which MACKIE has fallen in our own days.

b) From the opposite point of view, the contributions of TRAEGER and TARNOWSKI are to be noted.

According to TRAEGER, the selective criterion is to be sought in the distinction between the actual event and the abstract event. The *sine qua non* condition would be applied to every antecedent which, if mentally eliminated, produces a result in line, not with an **abstract category W**, contemplated by the single law (death, damage, injury, etc.), but with its opposite, that is to say the **non-W category** (non-death, non-damage, non-injury, etc.). Duplicative causes would also come into the category of conditions since they, **cumulatively**, that is to say, taken all together, cannot be mentally eliminated without the criminally relevant event W ceasing to happen, or rather, without the event being transformed into non-W, the opposite of W. So the traditional formula would have to be expanded: “Also the antecedent, the mental elimination of which, where no other duplicative cause exists, would result in the non-occurrence of the **relevant event**, is a *sine qua non* condition”<sup>138</sup>.

TARNOWSKI goes further. Asserting that the concept of condition is intimately linked to the concept of conditioned event, the scholar observes as follows:

1) since, in criminal law, the most appropriate description of the event coincides with the abstract description provided by the law, the condition should also be described abstractly. The descriptions should thus be perfectly symmetric: given the concept of the **abstract event**, only the notion of **abstract condition** could correspond to it<sup>139</sup>.

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<sup>134</sup> CALOGERO, op. loc. cit.

<sup>135</sup> MEZGER, op.cit., p 144 et seq.

<sup>136</sup> Choosing at random among many: “... every qualification of a fact constitutes an abstraction, and, from this point of view, the legal case and the actual case end up by coinciding” (DELITALA, *Il “fatto” nella teoria generale del reato*, Padua, 1930, p. 116); “it is not possible to think of a representation which is an end in itself and contains within itself the reasons of its own limits: it is therefore the qualifying activity which determines and identifies a reality within the limits in which it qualifies it, and it is by this qualification that the reality is represented” (BENVENUTI, *L’istruzione nel processo amministrativo*, Padua, 1953, p. 55 et seq.); “... during the trial we do not reconstruct any fact whatever, but a fact corresponding to a juridical concept, with the result that, having established this, and having verified the existence of an event which conforms to it, the legally valid judgment follows necessarily, indeed tautologically” (CORDERO, *Procedura penale*, 9<sup>th</sup> ed., Milan, 1987, p. 983); “The concrete facts can be understood only with the aid of knowledges, preliminary ideas, and can be determined only in a juridical frame and under juridical appreciation” (GORPHE, *Les décisions de justice*, in *Etudes psychologiques et judiciaires*, Paris, 1952, p. 83); “The description of the fact necessarily reflects a certain attraction for the concept through which the legal rule specifies the hypothesis to which it applies” (RICAUX, *La nature du contrôle de la Cour de Cassation*, Brussels, 1996, p. 80 et seq.). Further references are to be found in IRTI, *Rilevanza giuridica*, in *Jus*, 1967, p. 91 et seq.

<sup>137</sup> CALOGERO, op. cit., p. 133.

<sup>138</sup> TRAEGER, op. cit., pp. 41 et seq., 47 et seq.

<sup>139</sup> The writer is concerned to emphasize that, while discussing causation, when we speak of the theory of the causal link, the contents and the meaning of the expression “causal link” are normally considered to be absolutely evident. In general it is merely stated, in fact, that all antecedents which cannot be mentally eliminated without the event ceasing to

2) Unlike the actual event, the abstract event (category W) may be “caused” by an almost infinite variety of combinations of conditions; this would mean that the actual antecedent *a*, together with a certain group of other circumstances (*b + c + d ...*), may give rise to the causal process K which leads to event W.

3) To assert the existence (positive formula) or the inexistence (negative formula) of the causal relationship, it would be sufficient to verify whether or not the abstract category A was instantiated, regardless of the intervention of one (*a*) or more (*a'*, *a''*, *a'''*) actual circumstances; this would confute the apparently insurmountable objection created by the concept of duplicative cause: with regard to event W it would only matter that the abstract category A was instantiated and inserted in the remaining set of conditions (*B + C + D ...*), while it would be quite meaningless to wonder what circumstances, belonging to that category, had actually occurred. To sum up, to know whether a particular antecedent is a *sine qua non* condition, we cannot merely eliminate mentally it as an actual circumstance, we should rather eliminate the abstract category that was instantiated through (or also through) it.<sup>140</sup>

In short, both TRAEGER and TARNOWSKI affirm that the criminally relevant event is the abstract event described by the law. TARNOWSKI states that also the conditions are to be described abstractly; his thesis therefore **resembles**, like two peas in a pod, that of WRIGHT.

We may say, at this point, that TRAEGER partly, and TARNOWSKI more completely, were the authentic precursors of WRIGHT; the difference between the two German scholars and the American legal theorist lies in the fact that the former make the solution depend specifically on the description of the event and (in the case of TARNOWSKI) on the condition, while WRIGHT does not even pose the question. But, as I said, WRIGHT has no alternatives since, if his *necessary* antecedent referred to the actual event, its mental elimination would not prevent the latter from occurring in the cases considered by him; on the other hand, the *necessary* factor and the sufficient set can only refer, in WRIGHT’s scheme, to an abstract causal series, identified *a priori* on the basis of experience: otherwise there would be no sense in describing the event abstractly.

After this rapid summary of the different positions of legal doctrine in English and German writings, let us now attempt to understand what the most appropriate solution to the problem might be.

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occur, are possessed of an equal value in relation to the latter and can therefore all be defined as causes. ... But “this lapidary statement does not take into account the fact that, when examined in more depth, the expression in question raises a series of questions. For the rest, even among supporters of the theory of causal relationship, we can note significant differences of views ...” (TARKOWSKI, *Die systematische Bedeutung der adaequatem Kausalitätstheorie für den Aufbau des Verbrechensbegriffs*, Berlin, p. 34 et seq.

<sup>140</sup> TARNOWSKI, *op. cit.*, p. 38 et seq., reaches the solution indicated through a critical analysis of the thought of Traeger, that is to say through the following considerations: a) we should begin, like Traeger, from the observation that the legal scholar is not in the least interested in the event in its actual form: the event becomes relevant only when it can be related to one of the abstract categories contemplated by the laws. All the conditions realized by man, the elimination of which, in the presence of other factors, prevent the event from falling into the abstract scheme W, are possessed of equal value under the profile of juridical causation ... It is indisputable that we cannot inquire into the ‘degree’ of the relation of the single conditions for the event: but “this is an inevitable consequence of the insufficiency of human knowledge ...”; b) on the other hand, the process of the abstraction of the event – as Traeger himself recognized – could not “go so far” as to consider relevant only “death”, “personal injury” and so on: “this arises from the simple observation that otherwise, since all men are mortal, no circumstance could be held as a *sine qua non* condition”. The truth is that the abstract scheme of the event always includes specific material references, relating to time, space or action, references which vary as the single criminal cases vary and which therefore rule out the possibility of fixing in general, once and for all, the degree of abstraction with which the description of the event must be effected; c) the observations made by Traeger with respect to this must be rejected to the extent that, with these, we neglect to consider that the actual references indicated above are implicit in the abstract category W itself; d) above all it should be emphasized that “the recognition of the relevance of the abstract category W, reconstructed as previously said, does not mean abandoning the terrain of causal considerations but means, more simply, creating the premises for the statement of a causal concept capable of satisfying the requirements of criminal law”.

4. *The event as the result described by the law, which occurs hic et nunc, and preemptive causation.* – In my essay *La descrizione dell'evento* and in my subsequent studies, having discussed the thought of ENGISCH relating to the analogies and the differences between the activity of the judge on the one hand and that of the historian and the scientist on the other<sup>141</sup>, I reached the conclusion that the judge, like the scientist, uses “generalizing” propositions – that is to say the propositions contained in the law (“the death of a man”, etc.) – and, like the historian, “individualizing” propositions which refer to the material event, that is to say, to the event which occurs *hic et nunc* (here and now).

Why this reference to *hic et nunc* as a relevant modality?

Because, in order to impute the event to the accused, the judge must verify that the event contemplated by the law actually “exists”, and every judgment on existence implies a reference to *hic et nunc*.

I shall attempt to explain this better. Every “existential” judgment constitutes the “transformation of an antecedent existentially indeterminate or unsettled situation into a determinate one”; and since “whatever exists in and for judgment is something temporal-spatial”, the reference to *hic et nunc* becomes inevitable. The two aspects can be separated for purposes of analysis and exposition: but “there is no separation in the subject-matter which is analyzed”; every “narration” has a background which, if it were made explicit, would be the object of a “spatial” description; “things which happen take *place* in the literal sense of the word”; correspondingly, “spatial” references can have a meaning only in the context of a well-defined “temporal process”<sup>142</sup>.

I mean by this that every description (every “description-narration” as the linguists put it) implies a reference to “spatial-temporal” features such as will permit the identification of the event in question: whatever the function, literary or aesthetic, of the description, its logical function is to permit the identification of the meaning of a determined proposition, through the identification of the “existential material” to which the proposition itself refers<sup>143</sup>.

Naturally, “the particular identifications made are relative to the problem in hand”<sup>144</sup>: those made by the legal investigator concern the problem of the causal explanation of an event, contemplated by a law. For this reason, we say that the object of the judgment is constituted by the event “which occurs *hic et nunc*, considered only under the aspects contemplated by the law”. It could also be called “this actual event, contemplated by the law”, as long as it is emphasized that saying “this” we intend to point out, in fact, to the actual event which occurs *hic et nunc*.

To sum up, the problems raised by WRIGHT and by MACKIE concerning preemptive causation find a convenient solution through an appropriate description of the event. There is no obstacle to the functioning of the *sine qua non* condition or the *but for* test: the criminally relevant event is the event described by the law, which has occurred *hic et nunc*, which means that in the two cases proposed (the water-can and the fires) and in all analogous cases<sup>145</sup> it can be said that without the conduct under consideration (the emptying of the can, the fire which had already reached the house) the event would not have occurred *nunc* but in another moment.

It is possible to set out, however, as ENGISCH has done, more “sophisticated” cases, in which it might be thought that, through the intervention of the duplicative factor, the event would have occurred in the same place and at the same time as it actually did occur.

First example: A is about to be killed by the hangman but, while the latter is preparing to fulfill his task, there steps forward from the ranks of the spectators, in the grip of hate, the father of A’s victim who, thrusting aside the hangman, “sets off” the mechanism intended for the hanging,

<sup>141</sup> F STELLA, *La descrizione dell'evento* (The description of the event), op. cit., p. 169 et seq.; Id., *Leggi scientifiche*, op. cit., pp. 126 et seq., 235 et seq., 248 et seq.

<sup>142</sup> DEWEY, op. cit., pp. 220, 239.

<sup>143</sup> DEWEY, op. cit., p. 240, including the observation *ivi* that “in the Aristotelian scheme of science ... the proper description was also *ipso facto*, the proper and final *definition*. In modern science, proper description is strictly a means of identification ...”.

<sup>144</sup> DEWEY, op. cit., p. 240.

<sup>145</sup> Ved. R.W. WRIGHT, op.cit., p. 1018 et seq.

killing A in the precise moment in which he would have died by the hangman's hand. Second example: A is quarreling with B and, furious, shouts that he wishes he had a stick with which to give B what he deserves; C and D, friends of A who are watching the quarrel, hasten to get a stick which they had seen nearby; C is quicker to seize the instrument which he immediately hand over to A, who hits B with it<sup>146</sup>.

In cases of this type, the difficulties seem at first sight to be greater because the good functioning of the *sine qua non* condition and the *but for* test do not seem guaranteed even by a description of the event completed in the terms we have just indicated.

After a closer examination, however, we realize that the reference to *hic et nunc* is to be completed with further considerations, which go beyond the description of the event and concern the selection of the "duplicative" factors.

The criteria of the *sine qua non* condition and the *but for* test have a specific counterfactual form. Now – as WRIGHT observes – when a judge undertakes a counterfactual causal analysis he is not free to create a complete counterfactual world of every actor, event and causal process **imaginable**: imagination is not a judicial criterion and so it is not permissible to create a world that is merely possible and so irremediably indeterminate. The judge – to use an effective expression employed by WRIGHT and others – can construct only the most adequate "similar world": not, therefore, a possible counterfactual world, but a world built on our empirical knowledge, relating to the antecedents under consideration. And his empirical knowledge permits him to affirm that the "duplicative" antecedents which have actually occurred – the **mere** presence of the hangman on the scaffold and the **mere** action of D who tries to seize the stick but is preceded by C – do not of themselves, except by recourse to imagination and the construction of a possible and indeterminate world – allow him to sustain that the event would have occurred equally and at the same moment. To make a similar affirmation it would be necessary to know more: it would be necessary to be able to say, on the basis of adequate causal generalizations, that the presence of the hangman and the action of D were followed by other events and that a causal process was thus set in motion which "reached" the final result. To hypothesize the sole existence of two antecedents is not enough: what if the hangman had had an apoplectic fit, or what if D, while attempting to seize the stick, had tripped over? These, too, are questions which belong to a possible and imaginary world: in their banality they demonstrate that we cannot take into account antecedents which did not take place and that it is necessary, instead, to take into account exclusively the "factors" which actually occurred; but from these factors alone it is not possible to assert that the event would have occurred equally, at the same time. From this point of view, we can say, indeed, that the examples posed by ENGISCH are by no means problematical: ENGISCH himself says so when he observes that no causal law exists which would permit the linking of the mere presence of the hangman on the scaffold and D's mere attempt to seize the stick with the final result<sup>147</sup>.

If we think about it, these considerations can be valid for any other preemptive cause: after all, if the water-can had not been emptied, the traveler might have noticed the poison and avoided drinking the poisoned water. We are still inhabiting an imaginary and fantastic world which has no place in the criminal trial.

It is this observation which clearly demonstrates that the reference to *hic et nunc* plays an important role in excluding the relevance of hypothetical duplicative factors in the majority of cases, but that it has to be supplemented suitably by considerations about the hypothetical nature and therefore the inadmissibility of the creation of an imaginary world.

5. *The event, as a result described by the law, which occurs hic et nunc, and duplicative causation.* Preemptive causation would seem to present harder problems.

A handful of examples will make clear this question, too: a) fires X and Y, set off independently on two different sides, reach the house simultaneously, destroying it (the example is

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<sup>146</sup> K. ENGISCH, *Die Kausalität*, op. cit., p. 16 et seq.

<sup>147</sup> K. ENGISCH, op. ult. cit., p. 16 et seq.

taken from WRIGHT); b) A and B, unknowingly to each other, cause the breakage of two dams; from each of the broken dams pours out a mass of water sufficient to cause a flood: the two water masses join each other in a single current, creating a gigantic flood (the example is taken from *La descrizione dell'evento*); c) a man dies when two bullets fired by A and B simultaneously strike his heart (the example is taken from MACKIE); d) three doctors are called for a consultation and all three make the same mistaken diagnosis, leading to the death of the man (the example is taken from the Loi sentence, issued by the IV criminal section of the Supreme Court on 15<sup>th</sup> October 2002).

The examples of the two fires and the flood do not create particular difficulties: on the basis of well-known causal generalizations it can be asserted that the two fires which reached the house simultaneously destroyed it more rapidly than a single fire would have done, which amounts to saying that the actual event, contemplated by the law, would not have occurred *nunc* if there had been only one fire. Elementary physical laws tell us that a gigantic flood occupies a gigantic space, much more extended than that occupied by one of the two single floods: that is sufficient to affirm that, without the sum of the two floods, the event would not have occurred *hic*.

Let us come now to the example of the two bullets which simultaneously strike a man's heart. In English legal doctrine HART and HONORÉ<sup>148</sup>, followed by SCRIVEN<sup>149</sup> and PERKINS<sup>150</sup>, affirm that the causal relationship between both shots and the event "as it came about (death by shots from firearms)" is unquestionable. PERKINS states that the victim "would not have died in the moment and in the **circumstances** in which he died (with two bullets in his body) if only one (shot) had been fired".

This statement runs up against an objection which we already know: isolating the "two shots" from among all the actual modalities of the event in order to include them in the description of the event means considering solved the causal problem which instead needs to be solved. The usual tautology, the *post hoc, ergo propter hoc*.

MACKIE gives a solution which appears disconcerting: neither of the two bullets was in itself a cause because, mentally eliminating each of the bullets, the event would have occurred in any case by means of the other<sup>151</sup>.

Have we therefore to give a verdict of death by without a cause?

By no means: for MACKIE the cause of the event was the volley of bullets which included both of them since, without it, death would not have taken place<sup>152</sup>. Indeed: but if the two bullets were fired by different persons there was no volley, so where does that leave us?

What we do understand is that MACKIE wishes to defend at all costs the *but for* test and therefore the *sine qua non* condition.

The insuperable objections to which MACKIE exposes himself, however, induce WRIGHT to crow victory: the *but for* test is supplanted by the NESS test because this latter is able to resolve the problem of duplicative causation. Each of the two bullets – WRIGHT observes – is to be considered a cause in that it is a necessary condition for a sufficient "set" (firing a shot at the heart of a man is a sufficient condition for his death): "each bullet" – says WRIGHT – "is necessary for the sufficiency of a set of actual antecedent conditions that does not include the other bullet, and the sufficiency of each set is not affected by the concurrent existence of the other actually sufficient set"<sup>153</sup>.

Now, is it really true that the NESS test is the only criterion able to solve the problem? Let us try to see what happens on the terrain of the description of the event.

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<sup>148</sup> HART-HONORÉ, *op. cit.*, p. XLI, XLII.

<sup>149</sup> SCRIVEN, *The Logic of Cause, in Theory and Decision*, 1971, p. 54-55.

<sup>150</sup> PERKINS, *Criminal Law.*, 2nd ed., New York, 1969, p. 689.

<sup>151</sup> J. MACKIE, *op. cit.*, p. 47.

<sup>152</sup> J. MACKIE, *op. loc. cit.*

<sup>153</sup> R.W. WRIGHT, *op. cit.*, p. 1027.

Since a man cannot die twice, the problem under consideration has sense if we hypothesize, scientific laws in hand, that the sum of the two bullets had, so to speak, a synergic effect: the two bullets, acting together, accelerated, if only by a split second, the death of the victim.

If this acceleration took place, *nulla quaestio*: the criminally relevant event would not have occurred *nunc* if the heart had been struck by a single bullet.

The situation will not be different if death occurred as a result of just one of the bullets which anticipated, if only by a split second, the effect of the other.

Obviously, the real problem will be that of the evidence: but the probative aspect has nothing to do with the substantial criterion of the *sine qua non* condition and the procedure of mental elimination. It will be the task of the experts to establish what really happened and, if they are unable to do so, it will be necessary to make use of the criteria for deciding uncertain facts.

Even simpler is the case of the three doctors called for a consultation: if the patient felt the need to call three doctors, this means that according to his decision, the opinion of one doctor, or even of two, was not enough. Three opinions were really necessary: but if this was so, each of the three opinions was necessary – a *sine qua non* condition – for his decision to undergo the operation. We find ourselves facing a banal hypothesis of a set of necessary conditions and those, like the author of the Supreme Court sentence to which I have referred, who hypothesize the case of the three doctors to affirm the inadequacy of the *sine qua non* condition, are mistaken, and **very badly mistaken**.

6. *Duplicative causation; the expedients sometimes used by judges to violate the legality-mandatory principle.* – Ever since I began to study the subject of duplicative causation, I got the impression that there lay behind it a **much more serious** problem, connected with the continuing search, by certain judges, for **expedients** to justify convictions based, not on objective rules, but on subjective observations.

Today that impression is fully confirmed: the “cases” of duplicative causation on which discussion has been concentrated are “textbook cases”, separated from actual judicial experience which would be unlikely to occur in reality; in any case, even as “textbook examples” they are very marginal cases.

Why, then, have they aroused so much attention on the part of certain judges?

The answer is given us by WRIGHT: it is duplicative causation, together with preemptive causation, which has provided the pretext, suggested by certain legal scholars, for American judges to instruct their juries on occasion to establish whether an antecedent “**contributed**” to the occurrence of the event, or whether it was a “substantial factor” for its occurrence<sup>154</sup>.

The very vagueness of the concepts of “contribution” and of “substantial factor”, separated from the procedure of mental elimination, therefore provides the **picklock** with which to attribute causal efficacy to antecedents of which we know nothing under the causal profile. It is this consideration which led WRIGHT to elaborate the NESS test: the American scholar wishes to avoid juries’ deciding without the **guarantee** of an objective parameter. WRIGHT is very explicit on this point: returning to the subject in an essay subsequent to that of 1988, he drew attention again to the extreme **vagueness** of the ideas of “contribution” and “substantial factor”. “I have expressed the hope” – he says – “that, given the insights about causation and causal contribution that underlie the NESS test, a more useful test of causation might be devised to replace the **misleading** and completely **question-begging** “substantial factor” formulation and the **completely question-begging** “contribution” formulation”: the NESS test affirms that an antecedent **contributed** to a result if, and only if, it was **necessary** for the sufficiency of a set of actual antecedent conditions which was sufficient for the occurrence of the event<sup>155</sup>.

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<sup>154</sup> R. W. WRIGHT, op. cit., p. 1039

<sup>155</sup> Cf. R.W. WRIGHT, *Once More into the Bramble Bush*, op. cit., p. 1108.

WRIGHT is entirely correct: to use a language to which we are accustomed, the vague and question-begging nature of the verb **to contribute**, uncompleted by any reference to the necessary condition, clashes directly with the principles of legality, mandate and determinacy.

This is the meaning to be attributed to the statements contained in two recent sentences of the Italian Supreme Court (the Loi sentence of 15.10.2002 and the Ubbiali sentence of 5.12.2003), subsequent to and openly critical of the indications given by the Full Bench with the Franzese sentence of 10.7.2002, which recalls on every page the judges' duty not to violate the principle of legality and that of the personal attribution of criminal liability.

Starting from the asserted inadequacy of the *sine qua non* criterion and the process of mental elimination – an inadequacy which is allegedly revealed by presumed cases of duplicative causation (the three doctors called for a consultation) – the two sentences reach the conclusion that any antecedent is causal which “**contributed**” to the occurrence of the event or which was inserted “**efficiently**” in the causal process<sup>156</sup>. Thus the path is open to attribute causation to any antecedent without which, if mentally eliminated, the event would have occurred in any case, but which the judge, urged by the desire to punish, **thinks** might have “contributed” to the occurrence of the event<sup>157</sup>.

The pathway thus followed is so tortuous as to lead the judges to stupefying conclusions: an antecedent which does not appear causal on the basis of mental elimination, becomes causal in virtue of what is laid down in Article 41 paragraph 1 of the Penal Code with regard to concurrent causation.

This conclusion is so incredible and out of the law that it hardly calls for much comment: it is unanimously recognized that “concurrency of causes” means a concurrence of necessary conditions, that is to say of antecedents of which we already know that, without them, the event would not have occurred.

Today the IV Criminal Section of the Supreme Court wants to make us believe that this interpretation is mistaken and that the expression “equivalence of conditions” refers to an equivalence between factors which can be said, in the judge's unquestionable opinion, to have “contributed” to the occurrence of the event.

7. *A possible residual use of the NESS test.* – The important values implicitly expressed by the legality principle and in that of the personal attribution of criminal liability induce me to make an observation which I consider necessary as a matter of intellectual honesty.

I have indicated the path which should be followed in order to solve the problem of duplicative causation without subtracting anything from the crucial role played by the necessary condition and the procedure of mental elimination: it is the path of the description of the event, that is to say, the event as described by the law, which occurred *hic et nunc*.

But what if cases were to arise, outside the range of those so far examined, which cannot be solved even with reference to *hic et nunc*?

The **great concern** which occupies my mind as a legal scholar is always that of respect for the principles of legality and of the personal attribution of criminal liability: judges cannot be left free to improvise **at their own pleasure** the contents of a fundamental requirement of the case in hand such as that of causation.

This observation now urges me to sustain that if, in some exceptional and ultra-marginal cases, not even a reference to *hic and nunc* should succeed in solving the problem, recourse to the NESS test, in the context of a logical-systematic interpretation (which takes into account constitutional principles) could constitute a useful **supplementary** instrument to the notion of the contingently necessary condition.

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<sup>156</sup> Cf. The Loi sentence and the Ubbiali sentence of the IV *sez. penale* of the *Corte Suprema*, commented in F. STELLA, *Fallacie e anarchia metodologica*, op. cit., pp. 35 et seq., 43 et seq.

<sup>157</sup> Ved. F. STELLA, *Fallacie e anarchia metodologica*, op. cit., pp. 27, 45.

As the reader will recall, the reason for which I have considered the NESS test to be normally inapplicable is one of logic, the same logic which lies behind my criticism of ENGISCH's idea of adopting the concept of cause "proper to the natural sciences": the scheme of a sufficient **abstract** condition and of an **abstract** event, specified by a causal law, does not in itself justify its **pertinence** to the actual case. In order to establish if a certain causal law has been instantiated it is necessary first to identify the antecedents which the judge, in his hypothetical reconstruction, considers **relevant**: having looked at the moon or having worn a blue coat may constitute antecedents of the harmful event but they clearly do not constitute relevant antecedents and the judge cannot use them to formulate any hypothesis relating to the applicable causal law.

The need for a selective criterion is indisputable; and the only criterion for selection available to the judge is that relating to the question of whether a certain actual antecedent is or is not a *sine qua non* condition for the actual event, that is to say an antecedent without which the event would not have occurred. And only **after** having formulated the hypothesis that a certain actual antecedent was the *sine qua non* condition for the harmful event can the judge formulate a hypothesis – which remains to be verified – regarding the covering law model. WRIGHT's NESS test, like the idea of cause formulated by ENGISCH, forgets all this: with the result that we find before our eyes a test or a concept which cannot be applied because the necessary selective criterion is lacking.

This question, furthermore, does not seem to have escaped WRIGHT himself: "I can visualize the reader's eyes glazing and her head shaking at this point", he says. "You are probably saying to yourself (and others) that this technical method of analysis may be fine for ivory-tower philosophers, but surely one cannot expect it to be applied by jurors, judges, lawyers, law students, or even law professors. I agree, as I have previously said"<sup>158</sup>.

It is for this reason that WRIGHT declares explicitly that the NESS test has a purely supplementary role, aimed at substituting the formula of the "substantial factor" and the "causal contribution". Discussing modifications to be made to the *Restatement (Second) of Torts*, WRIGHT declares that his proposal for reformulating the *Restatement* "is the best formulation that I have been able to come up with for the empirical issue of **causal contribution** in tort law". And his proposal is the following: that an action or omission has "contributed to the injury if the act or omission was: a) necessary for the occurrence of the injury (that is, without *it the injury would not have occurred*), or b) independently sufficient for the occurrence of the injury"<sup>159</sup>.

As can be seen, the first criterion to be applied, according to WRIGHT, is that of the *but for* test: an antecedent has contributed to the actual damage if it was necessary for its occurrence. The criterion of the sufficient condition intervenes as a subsidiary criterion.

If we consider that the subsidiary criterion has been called upon to solve the problem of "having contributed", in the marginal cases in which this problem cannot be solved with the notion of the contingently necessary condition, it can be understood that there are good reasons for following WRIGHT along the road he indicates.

And these good reasons are all the more evident if we reflect on a fairly obvious consideration: the inapplicability of the NESS test is a criticism which concerns the test as a **normal** criterion for imputation, for the reasons I have just outlined (the lack of a selective criterion for the relevant antecedents); if we are considering hypotheses of duplicative causation, we can realize that the criticism based on the lack of a selective criterion no longer holds. By definition, in fact, the problem of duplicative causation is destined to arise precisely because we are asking whether an antecedent, considered **relevant ab initio** (the two shots at the man's heart, the two fires, etc.), can be considered causal: the criterion for selection therefore exists and this allows us to formulate a hypothesis as to the applicable causal law.

It remains true that the supplementary criterion refers to coverage under an abstract class of necessary-sufficient conditions (the NESS test is a test of strong sufficiency); but even the idea of a

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<sup>158</sup> R.W.WRIGHT, *Once More into the Bramble Bush*, op. cit., p. 1107.

<sup>159</sup> R.W.WRIGHT, *Once More into the Bramble Bush*, op. cit., p. 1108.



sufficient condition reflects, however much **less** than the necessary condition, a strictly juridical point of view. It would, in fact, be indisputably contrary to the needs of justice and equity of treatment not to punish an action which constitutes the necessary condition for a sufficient condition of an event: shooting at a man's heart or setting off a fire are undoubtedly necessary-sufficient conditions for the death of a man or the destruction of a house. From the point of view of criminal law, realizing a sufficient condition surely creates what is necessary for the causal imputation of the event.

8. *Final considerations.* – Wishing to sum up, I can summarize my thought in the following statements: a) the necessary condition, the *but for* test and the procedure of mental elimination remain the undisputed and indisputable cornerstones of causal imputation; b) the hypotheses of preemptive causation and duplicative causation, the subject of so much discussion among legal scholars, are “textbook” hypotheses, and furthermore marginal ones, and can normally be solved on the terrain of the description of the event; c) if there should remain cases of “contributions” which cannot be solved on the terrain of the description of the event (but none come to my mind), there would be no objection to the application of the NESS test as a supplementary and additional criterion; d) if an antecedent does not prove causal because, mentally eliminating it, the event would not have occurred, or else because in extreme cases – and not presently imaginable – it does not prove to be a sufficient condition, the judge cannot and must not declare the existence of the causal relationship: if he did so, he would be substituting the law with his own subjective conviction.

Some will say, *more solito*, that I have modified some of my ideas on causation. This is not true because I have, indeed, defended to the hilt those ideas whether on the terrain of the concept of the criminally relevant cause, or whether on the terrain of the description of the event.

But even if it were true there would be nothing strange about it: as POPPER says, the difference between EINSTEIN and an amoeba lies in their respective critical attitudes towards their own ideas. EINSTEIN can err just like the amoeba but, unlike the amoeba, EINSTEIN is happy to find his own theory wrong; the amoeba dies with its mistaken theory (or expectations or instinct or genetic program), EINSTEIN is instead tickled to death at finding an error in his theory. And Einstein wishes to find the error in his theory, in order to correct it and to advance towards more adequate theories<sup>160</sup>.

I do not wish to be an amoeba and therefore – if it is demonstrated to me that I am mistaken – I am ready to modify my convictions on the Italian and American covering law models, on the INUS condition, on the NESS test and on the criminally relevant cause.

I obviously hope that my interlocutors – first among them those scholars who have attempted to falsify the essence of the covering law model and the idea of the procedure of mental elimination – will wish to use the model of EINSTEIN, not that of the amoeba.

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<sup>160</sup> Cf. K. POPPER, *Objective Knowledge: An Evolutionary Approach*, Oxford, 1972.