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Traumatic Cancer?

Theodore Dyke*

Cancer has spelled horror to man since long before the fourth century, B.C., when Hippocrates bestowed the name of “cancer” upon man’s most dreaded disease.1

Perhaps the simplest description of cancer is that it is an uncontrolled new growth of human tissues. For some unknown reason, the normal cell goes berserk and loses its tendency to behave. The cell begins to divide, each cell becomes two, the two become four, and the four become eight, and so on, until the new growth reaches a detectable size.

All cells are born of a dividing parent cell. The far greater number however, are not capable of further division, as in the case of the nerve cell, which matures, differentiates, functions, and eventually dies. The more differentiated and specialized the cell is, the less likelihood that it may be replaced. Because these cells are devoid of the ability to further divide, it is generally accepted that cancer does not arise from these cells.

The lesser number are those which after a short period of life are capable of dividing themselves into two daughter cells, which have the exact same characteristics as the parent cell, including the ability to reproduce themselves. Cells found in the skin, bone marrow, and lymph nodes are highly undifferentiated. The more undifferentiated and less specialized the cell is, the greater is its rate of growth. It is from this latter type of cell that cancer originates.

In that cancer is an uncontrolled growth, it ultimately exerts pressure on the surrounding normal tissues, pushing against them and making its way through them by direct permeation. Some types of cancer have the characteristic of being able to “metastasize,” that is, they spread the parent neoplasm through the vascular system to other parts of the body. There, they possess the ability to grow like the primary tumor, pressing, pushing, and finally invading normal tissues.

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Cancer Causation

There is an enormous spectrum of medical opinion concerning cancer causation. At one extreme, there are those who advocate specific causes. Considering that there are some 150 known types of tumors, the median group support the proposition that in all probability there is no one universal cause of all cancers.

A match may start a fire, but the material must first be inflammable, and a breeze will fan the flame to fierce activity. At the other extreme, are the greater majority, who simply do not know.

There seems to be some general agreement that genetics and predisposition play a role in the sense of causation of cancer. It is hardly too much to say that a man’s biochemistry is as individual as his fingerprints, and that both are determined by his genes.

Dr. Hueper, on the other hand, speaks of heredity as playing a very minor role in the genesis of malignant growth.

Dr. Behan states that an inherited tendency is especially serious where there is a history of such a cancer in the immediate family, and is all the more serious if there is a history in both the father’s and the mother’s families.

If one has the misfortune to inherit poor materials from one’s ancestors the machines constructed from those materials can never be first class, and the “causes of disease” may wreck that machine, whereas they might have little effect on one of high grade . . . It is a question of the seed and the soil. If the soil is suitable, even a minute quantity of seed will grow abundantly and bring forth a rich harvest of disease.

Though still conjectural and far removed from being a well-established proposition, probably the most widely accepted

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2 Id. at 2.
3 Boyd, W., Textbook of Pathology, 195 (1961).
4 Boyd, W., An Introduction to the Study of Disease, 10 (5th ed. 1962).
5 Hueper, W. C., Occupational Tumors and Allied Diseases, 798 (1942).
6 Behan, R. J., Cancer, Special Reference to Cancer of the Breast, 84, 86 (1938).
7 Boyd, supra n. 4, at 60.
causal explanation of cancer is the mutational theory. Various forces are capable of transforming a normal cell into a cancer cell by altering a gene. When a cell varies significantly from the parent cell, a "mutation" has occurred. Dr. Warren supports this concept of mutation in relation to cancer which may follow chronic inflammation. Carcinomas have been observed to occur after chronic inflammation, burns and scars. Cancer of the tongue may be due to the constant irritation by a jagged tooth. Dr. Rigdon maintains that a single trauma may not cause a cell to mutate, but it should not be concluded that the repair which follows the injury does not influence mutation.

Amid this uncertainty of cancer causation, perhaps the most controversial area is the relation of a single, uncomplicated trauma to the development of cancer. Dr. Ewing, discussing physical trauma, lists among its important effects: separation of cell groups and tissue masses, as of the skin, gland, and bone; death of cells; confined hemorrhage requiring absorption or encapsulation; accelerated regenerative processes with an excess of blood and new growth of specific cells, blood vessels, and supporting tissue; and formation of permanent fibrous tissue.

Regarding the relation between trauma and cancer, he goes on to say, "Some of these conditions may be regarded as entering into the causation of tumors . . ." According to Ewing, the superabundance of statistical endeavors outweighs the meagre studies in the area of a causal relation between trauma and cancer. He says that there is a great need to know just how the various tissues are affected by trauma and " . . . of the mechanism by which such lesions lead to tumor growths." Because of some of the mystery which shrouds the factors which may interfere with the normal resultant healing and cicatriz-
tion processes following an injury to tissues, "... we do not have a satisfactory explanation of the apparent relation of trauma to certain tumors." 17

Behan is of the opinion that Ewing admits that trauma may be an important, but indirect, factor in the production of certain tumors. According to him, Ewing associates the trauma with such additional factors as delayed healing, infections, chronic irritation, local predisposition, and inherited tendency. He says that, "This is almost a confirmative statement in support of the traumatic origin of cancer." 18

Ewing's Postulates

The relationship of trauma to cancer may be of minimal import to the medical world; however, it is extremely important to the attorney from the point of view of compensation. Dr. Ewing has said "... several definite criteria have been widely recognized as essential conditions for the acceptance of a traumatic origin of a tumor." 19 These will be discussed in turn.

1. The authenticity and adequacy of the trauma. A great preponderance of the meagre statistical evidence supporting traumatic cancer has been flatly discounted by most medical experts. Underlying this policy of excision is the fact that few patients claiming such cancers are disinterested, they are seeking compensation.

Medical opinion regarding the degree of adequacy of the trauma runs the gamut of diversity and variance. Ewing contends that the least effect of the trauma must be to cause a rupturing of small blood vessels with hemorrhaging and discoloration of the skin. That in order to excite an excessive and abnormal proliferation of cells, the trauma must be able to excite some regenerative process. Regarding sarcomas which arise from deeper tissues, only the more severe injuries are capable of reaching these areas. 20

On the other hand, other experts maintain that it can never be a trivial injury, but rather it must be a severe one, wherein the tissues of the organ in which the cancer actually develops

17 Id.
18 Behan, supra n. 6, at 74.
20 Ewing, supra n. 1, at 104.
are either cut through, torn apart, or mechanically crushed so that they are profoundly altered.

It may be stated as axiomatic that trauma should be definitely associated as an exciting factor in cancer only when the trauma has been severe enough to cause a noticeable bruising, continued pain, swelling or a hematoma of the breast.21

This view is in accord with an early paper by Ewing in which he stated that only a severe injury can be regarded as a causative factor in cancer of the breast.22

Dr. Pack feels the adequacy argument is the purest of speculations. Cancers usually originate in a focus of microscopic size, and no one has proved that a massive injury is more likely to induce the genesis of cancer than a trifling minute trauma.23 Hueper is of the opinion that this postulate is for all practical purposes a meaningless and empty phrase. It is impressive, but of little value in the assessment of the causal relation between trauma and cancer.24

2. The previous integrity of the wounded part. This postulate poses an almost unsurmountable obstacle. Unless the situs in which the cancer later appears was in all respects in a normal state at the time of the traumatic insult the trauma could not be the “cause.” Since cancer starts as a tiny microscopic entity, it “. . . is not really possible ever to prove that trauma is the cause of a tumor, because it is impossible to be certain that the tumor was not there before.” 25 In effect, cancers can never be diagnosed from the exact moment they first occur.26

Thus a claimant’s statement that he had previously enjoyed good health and that the injured situs was in all respects normal at the time of his mishap is readily acceptable in court. But in the medical sense, the converse is true. Only if there was close medical scrutiny of the injured situs prior to the occurrence of the trauma, including not only a pathologic examination, but

21 Behan, supra n. 6, at 76.
22 Ewing, J., The Relation of Trauma to Malignant Disease, 40 Am. J. Surg. 30 (1926).
24 Hueper, W. C., Trauma and Cancer, Trauma 47 (1959).
25 Boyd, supra n. 3, at 197.
26 Cowdry, E. V., Cancer Cells, 243 (1955).
also an evaluation of the cells at the particular situs, can this postulate be met in the medical sense.

So strong is the evidence against the purely traumatic origin of most cancers that one must assume the attitude that a supposed traumatic cancer arises not in normal but in previously altered tissues. Trauma reveals more malignant tumors than it causes.27

3. The tumor must arise at the point of the injury. All experts are in accord that the cancer must arise at the exact situs of the traumatic insult. A cancer developing in the upper right quadrant of the breast would have no possible connection with a previous trauma to the upper left quadrant of the breast.

A somewhat more liberal view is maintained by both Pack, and to a lesser degree Hueper, regarding the principle of contrecoup. Pack states that the site of the injury must correspond to the line of force of the injury as in contrecoup fractures.28 Almost all of the experts, however, including Ewing, do not discuss injuries involving a transmitted force.

4. A reasonable time limit must be observed between the injury and the appearance of the tumor. There is no standard as to the time interval within which a cancer will develop to a detectable size. As a general proposition highly differentiated tumors grow slowly, while those composed of cells with low or no cellular differentiation grow rapidly.29 The most that may be said is that this latent period may be neither too short nor too long.

In order to comply with this postulate, a person who sustains an injury one day should not under any circumstances discover a cancer the following day. Pack cites a case in which a child's abdomen had been run over. There was persistent renal bleeding. Upon operation, an embryonal adenosarcoma was found. He says that had the hematuria occurred six to eight weeks after the accident, this etiologic postulate would have been satisfied.30 The period of delay tends to be less for younger people than for older people and less for sarcomas than for carcinomas.31

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27 Ewing, supra n. 19.
28 Pack, supra n. 23.
29 Hueper, supra n. 24.
30 Pack, supra n. 23.
31 Cowdry, supra n. 26, at 251.
It is evident from a partial listing of expert opinions that for all practical purposes there are no definite time limits as to the "adequate" interval within which tumors develop from traumatized tissue. The criterion of an "adequate interval," therefore, is actually without any real value from a medico-legal viewpoint. 32

5. The positive diagnosis of the presence and nature of the tumor is essential. There must be proof as to the existence of cancer in order to rule out benign tumors which only appear to be malignant. Furthermore, the type and kind of neoplasm is important because the rate of growth varies considerably amongst the many types of cancer.

It is axiomatic that the cancer which develops must be related to the injured tissue. Since it is safe to assume that there is no lung in a person's arm, the appearance of lung cancer cells in the arm following an injury to that area, could only be attributable to a spread of the cancer from the lungs. Proliferating neoplasms duplicate the cells and tissues from which they are originally derived. If the cancer possesses a cellular structure which is at variance with the structure of the surrounding cells, then it must be regarded as being metastatic in origin. This, of course, affects the timing discussed above.

6. Continuity of symptoms. These are the bridging symptoms which Dr. Cowdry stresses. 33 There must be a prolonged chronic disability between the time of the injury and the apparent onset of the cancer; there may be pain, swelling, lack of healing, or discharge in the injured situs. Ewing seems to place only a passing interest on his last postulate and says that it may only be of occasional importance. 34 Hueper lends no support whatsoever to these bridging symptoms, 35 and Pack does not include this postulate amongst his criteria. 36 In fact neither does Ewing in his 1935 paper. 37

Effect of the Postulates

When the clinical facts strongly suggest a traumatic origin, it becomes necessary to consider in detail their probable sig-

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32 Hueper, supra n. 24.
33 Cowdry, supra n. 26, at 251.
34 Ewing, supra n. 19.
35 Hueper, supra n. 24.
36 Pack, supra n. 23.
37 Ewing, supra n. 19.
nificance and at times to accept a traumatic origin as possible, although not proved.\(^3^8\)

In applying the postulates, many experts refer to a single uncomplicated mechanical or chemical injury, rather than repeated traumas or irritations.

These are the rules that must be followed in any scientific attempt to associate trauma and cancer. If one does not recognize such criteria, then one may conclude, without considering any further data, that there is no relationship between trauma and cancer. However, should one recognize the presence of such criteria, in the medical literature, then it will be necessary to consider the role of trauma in the origin of a malignant neoplasm that arises in an area of the body previously injured by trauma.\(^8^9\)

These postulates do not prove a causal relation of trauma to cancer. Rather they serve only to disprove and exclude those claims which are not within them. Once a case has satisfied the postulates the next hurdle is to consider its merits. Many experts, because of cancer's unknown causation, maintain that even though all of the postulates are satisfied, the cancer still may not be due to the trauma. It may be due to the trauma, but they just do not know affirmatively.

Dr. Leighton and Dr. Schmidtke cite a number of cases in which there was a causal relationship between trauma and cancer. These include: cut on chin by barber; cut on cheek while shaving; cut on lip while shaving; bruise on nose by a piece of wood; and a blow to left hand with a hammer. They felt that in none of these cases was there either imagination, or magnification. Most important, none of them were tainted by any claim for financial compensation.\(^4^0\) In accord with this position, Cowdry, after reporting a group of carcinomas in which trauma was considered to be related says:

One is inclined to admit that some of the cases presented are examples of single trauma carcinoma, in the sense that cancer would not have originated in these special locations at the times given in the absence of the trauma unless some

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\(^3^8\) Ewing, \textit{supra} n. 1, at 103.

\(^3^9\) Rigdon, \textit{supra} n. 9.

other carcinogen intervened to strengthen the influence of
the trauma for which there is no evidence.

. . . that none of the cancers was offered in claims by the
patients for financial compensation, indicates that the in-
juries were not purposefully imagined or magnified.41

On the other hand, Dr. Downing states that he has never
seen a case which satisfied all of the essential criteria demanded
by Ewing for the establishment of proof that a single trauma
could cause cancer.42 Dr. Stewart emphasizes the fact that most
trauma-cancer cases are baseless. Hospital histories are noto-
riously fragmentary both as to fact and evaluation. "The stories
told may combine the best features of Baron Munchausen and
Alice in Wonderland." 43

The testimony of the average physician is often held in no
better regard, since often the physician,

. . . is testifying for a fee or in order to collect a bill for
services rendered and I am sufficiently skeptical of my col-
leagues to believe that some, at least, share the common
herd's instinct to collect where they can . . . If I had my
way I would turn over every such case claiming trauma to
a psychiatrist to see how an original story of trauma would
end up. I have reason to believe that the end story might
be far different from the original.44

Stewart in stating quite positively that industrial cancer does
exist, takes a completely contrary view as far as there being any
connection whatsoever between a single uncomplicated trauma
and a cancer. He does offer one exception to this latter position,
however, when he says that the advocates of the traumatic
etiology of cancer may take some refuge in the thesis that the
individual who suffers from what they term a traumatic cancer
is one who possesses what they call a predisposition. This pre-
disposition may be either in the nature of a hereditary reaction
pattern to the injury sustained, or it may be a set of conditions
which exists in the injured area which "may give rise to tumor

41 Cowdry, supra n. 26, at 250.
42 Downing, J. G., Cancer of Skin and Occupational Trauma, 148 J. A. M. A.
245 (1952).
43 Stewart, F. W., Occupational Post-Traumatic Cancers, 23 N. Y. Acad.
Med. 145 (1947).
44 Ibid.
when the soil is suitably traumatized." In that there is no way of either proving or disproving experimentally the predisposition theory, "one cannot argue without fact." In a very brief treatment of the postulates, he says:

I do not propose to discuss these postulates save to say that they are only exceedingly rarely fulfilled in any case of traumatic cancer so-called. In fact it is in many instances frankly impossible that they can be fulfilled. I do however wish to call attention to the fact that when in the rare case they are, it really means nothing at all and the reasoning involved in acceptance of a traumatic etiology of a cancer is still of post hoc ergo propter hoc type and as science it has no value whatsoever. We still do not know what causes the tumor and our reactions are conditioned upon emotional rather than scientific grounds.

An attorney who feels that the shortcomings of the medical profession should not be visited upon the victims of industrial accidents, referring to Stewart's article says:

I have reason to believe as a result of recent conversations that I have had with Dr. Stewart that he has not changed the views expressed in that paper.

Most medical experts feel that trauma as a single factor is not a causative agent of cancer. Their position may be stated as follows: "Therefore, we firmly believe that the relationship between trauma and cancer is more often seen in the courtroom than in the patient."

The proponents maintain that rarity does not per se mean non existence. For example, it is generally accepted that exposure to sunlight may result in cancer, at least in some very few of us. But the correlation between the number of persons who are exposed to solar rays and the number of persons who develop cancer reaches the vanishing point.

Certainly, the occurrence of a local malignancy following trauma is a rare occurrence, but the fact that a neoplasm occurs too infrequently to justify a statistical relationship does not mean that there may never be a causal relationship. An error of logic is involved in reasoning that be-

45 Id.
46 Id.
48 Ludwick, M. V., Trauma and Cancer, A. B. A. Sec. on Ins. Law (1955).
cause an occurrence is rare, it follows that it cannot and does not happen.49

Referring to a single physical or mechanical injury, Cowdry says: "Obviously, millions of single traumas are experienced which do not produce cancers. That a very small number of them do, however, is highly probable."50 Cowdry fully supports Dr. Wainwright who said, "If we admit that the relationship between a single trauma and cancer has been a true one, even in one case, we must consequently admit that it may likewise be a possibility in any other case in which this relationship comes up for serious consideration."51

Aggravation of Pre-Existing Cancer

The next logical approach to this enigma is aggravation of a pre-existing cancer. The trauma is of sufficient propensity to alter the course of a cancer which is already present in the situs of the injury either by unduly accelerating its normal rate of growth or by disturbing and changing the existing cancer pattern.

An injury which hastens the death of a patient must be accepted as aggravation. This is often seen when a trauma causes immediate hemorrhage, infection, and collapse in advance stages of cancer of the stomach, or other internal organs. Such is also the case when there is a traumatic insult to a bone which houses a sarcoma, and there follows severe hemorrhage and infection. On the other hand, one may not assume any aggravation where the trauma merely brings about complications which are inevitable and about to occur in the normal course of the disease. In order to assume an aggravation, the trauma must of necessity introduce an element which is not inherent in the normal course of the disease and which works to the patient's disadvantage.52

Regarding a traumatic precipitation of what some experts refer to as "dormant" cancer, Ewing says in this early article: 53

50 Cowdry, supra n. 26, at 244.
52 Ewing, supra n. 19.
53 Ibid.
It is generally assumed that trauma may activate a latent cancer and increase the growth energy of the cells, but the grounds for this view are unsatisfactory. It is very doubtful if any primary cancer is ever in a state of quiescence, although the early growth may be slow. The idea that trauma may endow the cells with greater powers of growth must be rejected. The growth energy of tumor cells is determined by the conditions of origin, although its manifestations may vary with the environment.

Several years later, Ewing seems to modify this position when he says it is very difficult to obtain proof of such an event. A full explanation of traumatic sarcoma seems to require the assumption of certain local or general predisposing factors which have never been microscopically established. The presence of necrotic tissue may be a possible specific factor in the development of traumatic tumors.

In his early article, Ewing states that the traumatic insult must be of a severe crushing type in order for there to be any acceleration in the growth or metastatic process of the tumor. It is also possible that the trauma may accelerate the progress of some pre-cancerous lesions, which normally tend toward cancer. Yet, the trauma may have an inverse reaction on the lesion and interfere with its progress. No generalization is applicable to all of the cases. The rate of growth of a cancer is determined by many factors which are inherent in its origin and in its progress. Needless to say, it is difficult to establish any acceleration of growth that may be attributable to trauma.

It is not enough to accept accentuation as a fact in the case of an individual who has sustained a trauma to a tumor and has thereafter experienced what may be supposed to be unusual growth activity on the part of the tumor. The change in behavior must be something praeter naturam, beyond 'nature.'

Pack says the following:

It is possible for a single trauma to disrupt the tumor capsule, cause hemorrhage and infection and thereby unfavor-

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54 Ewing, supra n. 1, at 105.
55 Ibid.
56 Ewing, supra n. 19.
57 Ibid.
58 Stewart, supra n. 43.
ably influence the course of these lesions, but each case should be decided on its own merits or demerits.\textsuperscript{59}

Behan is of the opinion that trauma to a breast in which cancer already exists is very serious, especially if the trauma is severe enough to cause hemorrhaging. The cancer will be unfavorably affected by the injury and almost invariably assume a more rapid rate of growth and an increase in its malignancy.\textsuperscript{60} Auster conditions his position that trauma can probably aggravate an existing cancer by disruption of its capsule upon the premise that the traumatic insult must inject factors which alter the natural course of the disease. Though the period of latency may be of long duration in terms of years, cancer per se is rarely dormant or static. Acceleration of growth, infiltration, and density are all part and parcel of the normal pathologic process.\textsuperscript{61}

\textit{Court Decisions}

The leading New York case of \textit{Dennison v. Wing}\textsuperscript{62} very definitely takes the position that the relation between trauma and cancer is by far more often seen in the trial court than in the patient.

The question with which we are concerned is the alleged excessiveness of the damages. A verdict in the amounts awarded by the jury can be sustained only upon the assumption that the jury found, and could reasonably find, . . . that a breast cancer suffered by plaintiff's wife, ending in a radical surgery and removal of the breast, resulted from the accident. Close examination of the record leaves no reasonable ground, in our opinion, for finding that the accident was the producing cause of the breast condition.\textsuperscript{63}

Plaintiff's injuries, inter alia, included a transverse comminuted fracture of the middle third left clavicle, that is, a fracture directly across the collarbone with some fragmentation at the fracture site; and a swelling, contusions and hematoma of her upper left breast. Some two months following the date of the accident and about two days after her discharge by her doctor, the plain-

\textsuperscript{59} Ibid.
\textsuperscript{60} Behan, \textit{supra} n. 6, at 82.
\textsuperscript{61} Auster, L. S., The Role of Trauma in Oncogenesis: A Juridical Consideration, 175 \textit{J. A. M. A.} 946 (1961).
\textsuperscript{63} Ibid.
tiff noticed a small and soft pimple on her left breast near the armpit. This condition was not brought to the attention of any doctor for over three years from the date of the accident, when the pimple (tumor) became as hard and big as a nut. A biopsy disclosed that she had a scirrhous cancer of the left breast, requiring removal of the breast. A radical mastectomy was performed in which the entire left breast and the underlining muscles were removed.

The trial was essentially a battle between medical experts, and plaintiff’s medical experts simply did not measure up to a successful trauma-cancer campaign. Of the four attending physicians who observed and treated the plaintiff after her accident, only three were called as witnesses. Two of the doctors were orthopedists who treated the fractured clavicle. The third was the doctor who first diagnosed the possibility of a malignancy and sent her to the surgeon. None of these medical experts were called upon to testify as to whether or not the cancer was in any way caused by the trauma sustained by the plaintiff in the automobile accident. The only thing adduced from the third doctor on the crucial trauma-cancer question was the single statement that the plaintiff had a scirrhous cancer of the breast which was a slow growing malignancy.

Plaintiff also called a qualified pathologist who handled upwards of 5,000 cancer cases a year. He was asked the following hypothetical question:

Based upon your medical experience have you an opinion with reasonable medical certainty as to whether there is a causal relation between the trauma and the cancer?

After considerable reframing of hypothetical questions, the following gems were gleaned from this all-important witness:

A. My opinion is that there may be a causal relationship between carcinoma and trauma.
   A. It may have been.
   A. I believe that there could be a causal relationship between the two.
   A. That question cannot be answered with absolute certainty.
   A. An unequivocal yes or no answer cannot be given to that question.
   A. My opinion is that there may be a definite causal relationship between this mass that was felt by the patient and the subsequent occurrence of a carcinoma.
This expert, who unqualifiedly answered, "Yes, sir" in response to the question as to whether or not the trauma was a competent producing cause of the contusion of the left breast was unable to render the same unqualified response to the all-important question, "was the trauma a competent producing cause of the cancer."

The hypothetical question was still unanswered when plaintiff's attorney was able to gain an adjournment to the following day to allow the operating surgeon to testify with reasonable medical certainty as to a causal relationship between the injury and the cancer.

The next morning, plaintiff's attorney indicated to the court that he had made no attempt to serve the operating surgeon with a subpoena, but rather had made an unsuccessful telephone call to his office. However, in place of the operating surgeon he would call another doctor as witness, to whom he had briefly spoken the night before and who had no previous connection with the case whatsoever. He answered the hypothetical question by an unqualified, "Yes, sir."

On cross-examination this expert witness testified as follows:

Q. But you say that despite the fact that the cause of cancer is practically unknown that in this case you know there is a causal relationship and you would say the same thing before a medical society?
A. Yes, sir, I would.
Q. Well, what has been your experience, doctor, so far as the length of time it takes for a cancer of this type to develop?
A. Scirrhous cancer?
Q. Yes.
A. It takes several years.
Q. How many?
A. You can't pin a person down to that. All I can tell you is that it takes several years. It's very, very slow growing.
Q. Does it take ten years to develop, doctor?
A. It is conceivable.
Q. Fifteen years?
A. I don't think it would take fifteen.
Q. Do you draw a distinction between ten and fifteen?
A. Well, fifteen is very long cancer; ten years possibly in this type of cancer.
Q. The causes for cancer are still somewhat of a mystery, aren't they, doctor?
A. Yes, sir, very much so.

Then followed a series of questions revolving around the enormous frequency of traumas where literally thousands upon thousands of people were traumatized in the past two wars, as well as the number of cases before the Workmen's Compensation Board with the incidence of cancer amongst these cases being "very, very low."

The Appellate Division paid close scrutiny to this medical expert who "championed" the traumatic cause of the breast cancer. He was neither a breast nor a cancer specialist. At one time he had been associated with the New York City Medical Examiner's Office. His most recent case dealing with cancer of the breast was some three months prior to his testifying. He "was first consulted the night before he was to testify, solely for the purpose of enlisting his testimony. He had no knowledge of plaintiff's injuries or cancer except as recited in a hypothetical question." Furthermore, this expert disagreed with Ewing's postulates. This court made much over the fact that none of the attending doctors were questioned on the connection between trauma and the breast cancer. "Nor was the doctor who performed the breast operation called."

For its only medical expert witness the defense called Dr. William Hoffman, a cancer specialist who had been associated with Ewing from 1930 to 1934, and who incidentally invariably testified for the defendant. He testified as follows:

Q. Can cancer of the breast be caused by injury or trauma?
A. No. Cancer of the breast has never been produced by trauma, by injury.

His opinion was based essentially on the fact that no one has ever succeeded in producing cancer of the breast in any experimental animal by injury and that cancer of the breast is no more frequent in women whose breasts have been injured than in women whose breasts have not been injured. More particularly, a scirrhous cancer is the slowest growing cancer of the breast. To grow to the size of a pimple would take far longer than the time within which plaintiff contended it did. Therefore, the tumor must have pre-dated the injury. "Now for these two reasons: First, that one cannot cause a cancer of the breast by injury, and second, that the size of the pimple at
the time it was discovered five weeks later indicates that it must have been in existence before that, therefore it couldn't have caused by the injury. It was already there."

On cross-examination of defendant's expert medical witness, the first reference was made to Ewing's postulates. The defense had steered a wide course away from these postulates, notwithstanding the fact that the causal connection of trauma and cancer in plaintiff's case failed to comply with two of the postulates, namely that, "the cancer must develop exactly at the site of injury, and the cancer must not develop until there has been a sufficient time interval after the injury for it to develop and reach a detectable size." This witness stated that the postulates don't prove a causal relationship of trauma to cancer, but rather serve only to exclude such claims.

In spite of any objective skepticisms a student of trauma-cancer may have concerning this case, and there are many, the subjective nuances of twelve impartial jurors are insurmountable. The poor woman has cancer. Everyone knows a blow can cause cancer. Even Dr. Ewing says so. If he doesn't know, nobody knows.

The court's charge ground out the usual: fair preponderance of credible proof; weigh evidence; whether or not you believe all the facts; testimony of interested witnesses; case is important to plaintiff and defendant; and the fact that neither plaintiff's nor defendant's medical expert saw the plaintiff.

Sympathy you have for Mrs. Dennison, I know. Put that sympathy aside, . . . I must insist that you do it, . . . and decide this case fairly, where you believe the merits of the case to be.

The jury decided that the accident caused the cancer in Mrs. Dennison's left breast. Millions of women, throughout the world undergo a gamut of traumas to their left breast with only the barest minimum of cancer incidence. The jury relegated Mrs. Dennison to those very select few.

The Appellate Division set aside the jury's verdict placing great emphasis on Ewing's postulates. The plaintiff failed to comply with two of the postulates: the site of the injury, and the time within which the cancer developed. "Nevertheless, in an attempt to connect the cancer more proximately with the accident, plaintiff placed the discovery of the pimple from which the cancer grew at a time only two months after the acci-

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dent." The Court felt that it was inconsistent with the postulates that this very slow growing type of cancer should have taken detectable form within two months after the accident. More important and conclusive was the fact that the cancer did not develop at the exact site of the injury.

The Court set other requirements for the establishment of a causal relationship between trauma and cancer. The plaintiff is expected to produce the attending doctors who have observed and treated the condition for the purpose of giving their opinion as to whether the injuries they observed caused the cancer. In addition the plaintiff should produce one or more recognized authorities on cancer.

In *Sikora v. Apex Beverage Corp.*, plaintiff, while walking down a ramp in a subway station, slipped and fell, sustaining what the court termed "inconsequential" injuries to his right shoulder, hip, head and back. The only resulting injury which was not "inconsequential" was the claim of an aggravation of an existing cancer of the right breast. Unlike the *Dennison* case where the tumor appeared some two months following the accident, in this instance the lump, about the size of a pea, was noticed for the first time about a week following the accident. Within a few months the pea had assumed the size of a walnut when it was diagnosed as cancer. The result adhered to the usual pattern, radical breast surgery.

Obviously the case could not be based on a direct causal relationship, because of the *Dennison* rule which holds that to establish cause there must be a reasonable time limit between the injury and the appearance of the tumor. Only one course was open for the plaintiff, a concession as to the origination of the cancer and proceeding on a theory of aggravation. Even under this theory, the plaintiff was faced with a formidable obstacle, since it is generally conceded that the injury must be to the exact situs of the tumor. In the instant case the closest the plaintiff came was, as the court said, an inconsequential injury to his right shoulder, several inches away from the target point itself.

Plaintiff again was faced with only one alternative, to base his case on the notion that the aggravation and resulting acceleration was due to the transmission of an indirect force from

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the injured right shoulder to the cancerous focus. Plaintiff relied exclusively on two factors to support his claim, the principle of contrecoup and Dr. George T. Pack's article, *The Relation of Trauma to Cancer*. Contrecoup is generally associated with injuries to the skull. The fluid mass contained within the cranial cavity in which the brain rests is capable of being subject to shock waves induced by trauma. Conceivably a person receiving a blow to the back part of his head might sustain an injury to the frontal aspect of the skull, since the impact of the blow is transmitted indirectly via the cranial fluid from the back of the head to the front. For some medical experts such an injury would comply with the postulate requiring a direct blow to the cancer site. Dr. Pack seems to extend this generally limited view to other areas of the body, when he says that the cancer may also arise in an area which is in the line of force of the injury as in contrecoup fractures.

By analogy to the brain resting in its surrounding fluid, plaintiff theorized that both the shoulder and the breast repose in a common media, the pectoralis muscle. Raise your right arm and shoulder, and you move your breast; both areas are unyieldingly interdependent. Therefore, a blow to the shoulder will directly result in a traumatic force which is transmitted indirectly via the pectoralis muscle to the cancer situs in the breast causing aggravation and acceleration. This unique theory was propounded by two physicians, one a pathologist and the other a radiologist. The pathologist acknowledged that he had never treated cancer of the breast and the radiologist admitted that he had not been connected with any hospital that specialized in the care or treatment of cancer. The radiologist was of the opinion that the injury to the shoulder indirectly activated a quiescent or arrested cancer, resulting in a subsequent rate of growth from its size at the time of the injury to pea size and eventual walnut size which was unusual and inordinate.

The defendant produced two cancer specialists who had treated and diagnosed cancer patients for many years. They testified that plaintiff had the fastest growing type of the breast, that it would not have been quiescent or dormant and that the rate of growth was not unusual. Both staunchly defended the

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65 Pack, *supra* n. 23.
66 Ibid.
direct blow theory and completely discounted the indirect transmission of force from the shoulder to the cancerous focus. They further testified that the only way in which trauma could aggravate a cancer was by rupturing and spreading the cancer cells, and the fact that the cancer here had not spread to surrounding tissue negatived the notion that its growth had been affected or aggravated in any way by the trauma.

A unanimous Appellate Division reversed the lower court verdict for the plaintiff both as to liability, and more important, on the jury finding that the indirect trauma aggravated the existing cancer. Without reflecting upon the qualifications of plaintiff's experts within their limited fields, the court said that it is apparent that they did not have the experience or qualifications to speak authoritatively of the effect of trauma upon a cancer or its growth and that their opinions were not grounded on scientific facts. In the absence of a direct blow to the site of the cancer or a showing of its spreading into surrounding areas, there is no adequate basis for believing that the growth of the cancer was in any way affected or accelerated by plaintiff's fall.

The Appellate Division conceded that the instant case was distinguishable from Dennison, which the same court had considered some few months prior, in that this was a case of aggravation and not inception. But that was the sole distinguishing characteristic. To succeed in a cancer case, whether it be cause or aggravation, there are two vital and necessary conditions: plaintiff must produce testimony by qualified cancer experts, and secondly, the trauma-cancer connection must satisfy Ewing's postulates. It is as simple as that. A jury may weigh evidence, credibility and all of the facets which make up a trial, by the ton. Yet the Appellate Division will tip the scale if these are lacking.

The Court of Appeals affirmed the Appellate Division:

The absence of a direct blow to the site of the cancer or spreading into surrounding areas, there is no adequate basis for believing that the growth of the cancer was in any way affected or accelerated by plaintiff's fall.67

The case of Avesato v. Paul Fishman Co.68 has the distinc-

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tion of encompassing both causation and aggravation. During the course of employment plaintiff fell down a flight of stairs. Among other incidental injuries he sustained some type of trauma of the breast. On various occasions he claimed that the nipple was either knocked off, lacerated or scratched. Four months following the accident he was found to have a malignancy of his breast and a radical mastectomy was performed.

Plaintiff originally claimed that the trauma caused the carcinoma. During the course of the trial, over objections by counsel for the defendant, the court permitted the plaintiff to amend his pleadings to the theory that the trauma aggravated or reactivated what was at the time of the injury an existing but dormant or quiescent cancer.

Plaintiff's motion to amend was probably motivated by the realization that the combined efforts of his own medical experts placed him in the awkward position of not having a causation case at all. Both the surgeon, who excised the tumor, and the pathologist, who examined the malignant tissue, testified that the trauma could not have caused the cancer of the breast. The size of the excised cancer showed that it would have taken anywhere from six months to a year and a half for the tumor to grow to the size it was at the time of excision, which was about four months after the accident.

The pathologist claimed that a trauma could aggravate the previous existing cancer and accelerate the metastases. He further claimed that there may be a dormant cancer, although he had no corroborating authority, nor had he ever made a diagnosis of a dormant cancer. The surgeon testified that there was a causal relationship between the trauma and the subsequent events, that a dormant tumor may be reactivated by a trauma.

Dr. William Hoffman, who as the court stated, has devoted his professional life to the study of cancer, testified for the defendants. It is interesting to note that this doctor, circa 1953, testified in about 200 cancer cases per year, always for the defendant, including both the Dennison and Sikora cases. He stated without equivocation that trauma could not cause a cancer of the breast, that this was an old fashioned theory. Only excess female sex hormones cause cancer of the breast.

In response to a question concerning the new basic theory of the case, a dormant cancer, the doctor's response was an
emphatic "no." There is no way of ever proving that cancer cells are ever dormant, because if the cancer cells show no signs of division, no one can recognize it as being a cancer. It is unreasonable to assume that a cancer is ever dormant. To claim aggravation is mere speculation. It is impossible to accelerate the rate of growth of any cancer of the breast by trauma. In fact, a trauma to the cancer kills the cells which are traumatized. All cancers metastasize from the earliest hours of the malignant change. Dissemination is a constant process taking place every few minutes.

There were considerable discussion of both Ewing's postulates and Pack's postulates in determining causal relationship. Even if all of the postulates are satisfied, it does not establish causation. These criteria were established to eliminate all those cases which are unworthy of consideration.

The court then refers to the Sikora case, which as it says, set up sign posts for a causal relationship of trauma to cancer:

In the absence of the direct blow to the site of the cancer or spreading into surrounding areas, there is no adequate basis for believing that the growth of the cancer was in any way affected or accelerated by plaintiff's fall . . . If the converse is true, I submit that the court is writing into law conclusions concerning medical matters on which the medical profession itself is not agreed.

The court then granted defendant's motion to strike out all evidence of permanency of injury based on the cancer, since the claim of causation was abandoned and plaintiff elected to pursue the theory of aggravation.

There is a sequel to the Avesato case. Realizing the insurmountable barriers of establishing a causal relationship between trauma and cancer on a theory of negligence, plaintiff then instituted a claim with the Workmen's Compensation Board. The Board held that claimant sustained the injury in the course of his employment, and more important that there was a causal relationship between the injury and the cancer which was supported by substantial probative evidence.

There was medical testimony on behalf of the claimant that the injury was adequate to damage the tissues and to set up a sequence of changes causing the condition which was found at the time of the operation. And under any circumstances if there was a pre-existing condition, it was aggravated and accelerated.
by the accident. The carrier's expert in turn testified that under no circumstances could the trauma have caused the condition.

On appeal the Appellate Division said the following:

This resulted in a medical dispute and it was within the realm of the board to resolve the factual question in favor of the claimant based upon a finding of substantial evidence.

The court affirmed the Workmen's Compensation Board.69

The case of Goodenough v. General Motors Corp.70 represents the attitude of the court in trauma-cancer cases which originate before the Workmen's Compensation Board. An action for death benefits was brought based upon injuries decedent sustained to his leg which tore open a melanotic tumor, which in turn caused a cerebral hemorrhage from which the decedent died. As usual, there was conflicting medical evidence as to causal relationship between the injury to the leg and the resulting death. The board found that the decedent died as a result of cerebral hemorrhage due to a metastatic sarcoma as a result of the injury to his leg. The Appellate Division affirmed the board saying that the conflicting medical evidence as to causal relation "presented a question of fact for determination by the board."

A long time ago, a court in a cancer case in another state, Baltimore City Passenger Railway Co. v. Kemp,71 said, "Whether the direct causal connection exists, is a question, in all cases for the jury, upon the facts." In the light of heritage and the New York courts' attitude regarding trauma-cancer cases before the Workmen's Compensation Board, it is difficult to reconcile the courts' position over the very same subject matter in a negligence case.

Conclusion

The adversary method is not well suited to proof of medico-legal subjects.

. . . a very essential addition to the present machinery would be the establishment of an impartial panel of experts. Only through such a device can new scientific evidence be utilized in an unbiased fashion. Informative studies are of little

71 61 Md. 619 (1883).
medico-legal value if their results are distorted or exploited by one side or the other.\textsuperscript{72}

Another author has expressed similar thoughts:

The lack of courage of the physician as witness and the lack of preparation of the lawyer as counsel more often precludes justice to the defendant. Stimulated by the interest of Judge Peck and Dr. Howard R. Craig, Director of the New York Academy of Medicine, with the cooperation of the Medical Societies of New York and Kings Counties, a start has been made in clarifying the issue of trauma in cancer by the establishment of an impartial panel of approximately 100 specialists who function as amici curiae in negligence cases.\textsuperscript{73}

Ironically, contrary to the hopes expressed by these authors, the New York County Impartial Medical Panel, which became a pilot project in 1959, does not accept or entertain any liability claim dealing with cancer. In their opinion, as in the case of malpractice, traumatic cancer is a highly controversial subject which is not within the proper scope of such a board.

But the real problem is that no one knows what "causes" cancer. The present state of the medical art indicates that a given cancer may be caused by any of a number of factors, acting singly or jointly. Trauma is one of these factors, but the exact effect of a single trauma in causing cancer is unknown. Medical experts will honestly differ in their opinions, because in fact they are frequently just opinions or theories and not scientific conclusions. At this point the physician's personal leanings to the plaintiff (or the defendant) may color his views; or possibly the litigant chose the given expert because of his well-known views. In any case, because the plaintiff bears the burden of proving causality, the lack of medical certainty will usually lead to a defendant's verdict.

In short, because of the physician's distaste for the courtroom, coupled with the law's insistence upon pinpointing a "cause" in an area of medical ignorance, "Causation is a rather fuzzy abstraction with a touch of metaphysics."\textsuperscript{74} It can, however, successfully be brought into sharp focus, based on reliable medical opinion, as a very recent case illustrates.

\textsuperscript{72} Traenkle, H. L., Com. on Stoll, H. L., and Crissey, J. T., Epithelioma from Single Trauma, 62 N. Y. S. J. of Med. 496 (1962).

\textsuperscript{73} Auster, \textit{supra} n. 61.

\textsuperscript{74} Shimkin, M. B., On the Etiology of Cancer, 8 Chronic Diseases 38 (1958).
Plaintiff developed an epidermoid carcinoma requiring a complete laryngectomy, allegedly the result of injuring her throat when she struck the side of a car and swallowed glass. The issue of causation developed sharp conflict of medical fact. On appeal the court stated:

75 . . . we find the resolution of the jury in favor of the plaintiff is supported by a preponderance of the evidence. It would be difficult to conceive a better qualified physician than the plaintiff's expert as to this particular phase of medicine. It is generally conceded by the medical profession that the origin and cause of cancer cells are unknown. It is likewise a fact that medicine is not an exact science but in the legalistic sense when a doctor in circumstances such as here expresses an opinion based upon a fair and accurate hypothetical question and establishes relationship between the accident and the injury, it is acceptable and the only reasonable basis on which to predicate the right to recover. It is for this reason that the courts have come to permit the injection of words such as 'possible' and 'probable' by the medical profession in expressing an opinion . . . (on cancer causation).