PRESIDENTIAL ADDRESS

"Acts of God and Climatic Expectation"

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There is more than sufficient indication that in our courts today are cases involving the concept of an Act of God versus a loss brought about my man or his works. The concept of an Act of God comes from the days of the past when ignorance and fear prevailed and man suffered from not knowing what brought about lightning, thunder, floods, earthquakes and destructive winds. At such early times man felt that the destructive forces were punishments for wrongs and the Gods were displeased. The extent of the losses were in direct proportion to the nature of the misdeeds. Such punishment and losses were accepted as a way of life.

Ages later along with the development of civilization came the law and the ruling of that society by the law. In the American Jurisprudence System we now have sections defining Act of God as it relates to losses suffered by society and the acceptance of the losses as an area for debate. Thus the definition of an Act of God as now recorded in American Jurisprudence is a natural event which is:

1. Sudden
2. Unusual
3. Unexpected
4. Could not be reasonably predicted (1)(2)

This force of nature, an Act of God, is generally thought to be difficult to guard against and difficult to resist. In order to make a judgement as to whether an event is an Act of God or the result of some other action two questions can be raised:

1. In consideration of the sophistication of current technology is reasonable and suitable forecasting of expected events being made available to those that need such forecasts.

2. In consideration of the records of past events is man using the information in building, planning, and providing protection against events similar to those of the past.

If matters have not been complicated enough we must now also recognize that the technology that aids us against natural hazards also now provides information to the rest of the world of disaster within a short span of time. At the same time agencies dedicated to provide help to the needy become aware more rapidly than ever of the events. Government agencies develop programs to aid in the losses of "An Act of God". Thus it may well be that losses are accentuated, media information erroneous, and causes of losses misinterpreted. Along with societal effort to provide relief from losses, Acts of God or otherwise, has developed an increased activity to retrieve losses through court action. Since many of the cases involve climatic events it is to this theme the substance of this paper is directed.

Climatic Events

It seems to be an almost daily occurrence to read in the paper of some loss from wind, rain, snowfall or severe storm. Losses often occur in the millions of dollars and the loss of life is not uncommon. The question can be raised as to why these climatic events occurred, were they unusual? Will they be repeated and what can be done to protect society against them? Is society or the government to be expected to replace losses? The court docket indicates that some try to find solutions through court action. Some are widely publicized while there are countless numbers of cases that

pass unnoticed except for the litigants. Some cases show a remarkable lack of appreciation for the nature of climatic events as energy systems in our environment. Normal potentials of rain, wind, snow, drought, and related features of floods, land slides, avalanches, and other events are ignored. In Indiana are some of these events that in court action have been described as unusual.

Rainfall(3)

Rainfall in Indiana has such a well developed pattern or regime that it is difficult to realize how anyone can avoid knowing it. Rain is water and water has weight and mass and flows down slopes; rain comes in drizzles, and drops and drops in what seems bucketfuls at times. Most of us experience rains that result in a quarter to half inch a day and several times a year a day with two inch rainfalls. Rainfalls in Indiana are often heavier. Rainfall of more than five inches in two days occurred in every month of the year and has been recorded in at least 30 classic or long time climatic stations. In 1860 6.50 inches of rain fell in one hour at Batesville. On June 26th in 1934 Brazil had 3" in one half hour. A maximum 24 hour rainfall occurred in 1973 when approximately 13" fell in the area of English, Indiana. Monthly rainfalls of over 10" are not uncommon for any part of the state. Unexpected large amounts could hardly be considered an Act of God in the definition previously provided. A point in issue. A car traveling after dark in a rural area during a heavy rainfall (one expected several times a year) came into a flooded street and hydroplanes, and runs into the ditch and several people are hurt. A consequence is a suit against the county for not having the road properly drained so that ponding did not occur.(4) Work was being done on the road and construction signs were present. The county claimed reasonable precaution against the Act of God and the conditions that prevailed. There is no climatic station at the site of the accident, nor could it be expected that there would be one. Nearest climatic stations provide the basis for interpreting the rainfall as being about 4" in 24 hours, not an unusual amount. In reality the driver of the car ignored the hazard of heavy rainfall and associated weather conditions, not an uncommon failure, and traveled too fast. The case also brings up the matter of how to interpret the existence of "heavy rainfall" when no rainfall station is present. We now know that in any particular passing storm precipitation received at the surface can vary greatly within a relatively small area such as a county. Legal procedures frequently use the witness of a longtime resident, "a credible witness", as the basis of determining the unusual event. Thus a 40 year resident might be asked to recall similar past events. At issue is the frailty of the human mind and the length of time needed to establish a record of what might be expected.

When rainfall occurs obviously its receipt at the surface is accepted in many ways. Hopefully necessary amounts provide ground water supplies and the balance reaches the streams to provide the supply for those water bodies. In reality an inch of rainfall provides about 109 tons of water for every acre whether it be corn field or shopping center parking lot. It is statistically impossible to estimate a 100 year flood scenario but this assumes that a certain amount of rainfall occurs within a certain area under average conditions. It doesn't consider the surface condition, the alterations to topographic forms by levee construction, road beds or other topographic changes. An average Indiana County for 400 square miles receiving an average rainfall is the recipient of an enormous volume and weight of water on its surface. It should not be unusual then to find that streams in flood can do severe amounts of damage. Recognition of the potential damage should be the basis for sound planning and construction. Modern technology should leave little reason to consider rainfall an Act of God when it causes destruction.

Snowfall

A few years ago the then Mayor of Terre Haute was challenged as to why the city had done such a poor job in removing the snow from the streets. He replied to the effect that God put the snow there and in due time would remove it. Behind such a story is the fact that snowfall is not traditionally heavy in the Terre Haute area or at least memory banks in the mind of its citizens don't recall the facts; at least a lackadaisical attitude toward snow prevailed. Since 1960 there have been three years of what was considered to be unusually heavy snows. During such periods snowfall may exceed 14" or more in one day. Such an amount may occur as frequently in the southern part of the state as well as the northern part of the state. The amount for one day may be equal to the amount many Indiana stations receive in one year or in the snowiest month for some stations. The last thirty years of records reveals the true potential of snowfall. In a case of litigation a contractor installed for a homeowner an add-on porch of glass and aluminum. The following winter a heavy snowfall of more than 12" brought about a collapse of the structure. The homeowner brought suit for recovery of loss from the contractor. The snow records although showing heavy snow would also prove it could be expected to be of the amount shown at least every ten years and thus not extreme. Snow twelve inches deep weighs from 4 to 5 pounds per cubic foot. A roof of normal house size under 12" snow may acquire a load of five to eight tons. Since snow may not dissipate until melting occurs, the weight may be a burden on a structure for a considerable period of time. Indeed the contractor erred in evaluating structural strengths.

In a recent severe winter a railroad company that was in the process of abandoning a right-of-way contracted to have the rails pulled and ties removed. The task was a winter season task with a deadline. Heavy snows occurred and the contractor did not meet the deadline claiming the heavy snows interfered. When the railroad declined payment the contractor sued. Although the plea an Act of God was not proved, associated circumstances related to the acquisition of suitable moving equipment under the environmental conditions did result in the contractor recovering his monies.

Further hazards associated with snow are created when displacement takes place and wind drifts accumulate to many times the depth of the snowfall accumulating more weight through compaction. On a national level we have seen several new structures, namely sportsdomes, suffer snowstorm damage but also shopping centers with poor structural features destroyed more thorough disregard for reality and the urge to reduce costs in initial construction.

Wind

Wind is an insidious feature of the climatic world because it is essentially invisible in its appearance on the surface. As as agent in climate it is the great transporter of material. An early classic geology book claimed that as a result of wind action every square inch of the surface of the earth had a particle from every other square inch of the surface of the earth. Air moving from one area to another is a quickly initiated process as per the experience one feels when a cloud passes in front of the sun on a summer day, and wind action ranges from the gentle breeze to the intensity of winds estimated at over 225 MPH and not measured by traditional wind devices. In addition there are the winds associated with tropical storms and tornadoes. These localized storms will be commented on later.

Although Indiana is not to be considered as a state characterized by excessive wind activity most areas will receive winds that will damage trees two or three times a year. This implies winds of forty miles per hour or better. Non-tornado winds of 50 or 60 MPH and gustiness prevails when strong fronts pass through. Stronger winds

are associated with tornadoes. Wind velocity in itself is not the lone potential hazard. A review of charts from the wind recording machine also indicates the rapidity and frequency that wind changes direction thus resulting in twisting and turning of limbs and other objects. Long recognized are the natural features of valleys and hills and other topographic forms that modify air movement and velocity into classic winds. Now we must recognize the features added by man in the form of structures, barns, buildings, highrises, and skyscrapers. These structures telescope winds modifying their velocity and direction.

A case in point-in a construction project on a campus the contractor stacked plywood removed from a previous work site in a pile. A few days later in a period of a passing front, the sheets, 8 ft. × 4 ft. are tossed around by gusts of wind up to 60 MPH. A man is struck in the back by a sheet and suffers a lot of pain. He sues the contractor claiming carelessness for not taking precautions and preventing the wood from blowing around. The injured does not conceive the wind storm as an Act of God. The contractor disclaims responsibility claiming that it was an exceptional storm and therefore it was beyond what he would be expected to provide protection against, and any wind capable of moving standard sheets of plywood is highly unusual. A study of their records for the stations nearby would reveal that although 60 MPH winds are high they do occur with sufficient frequency to justify their expectation several times a year or more. In addition, since the construction site was associated with other nearby large buildings, winds were tunneled with increased velocity. Unfortunately in the site where the incident took place climatic statistics are not collected so the climatologist must provide knowledgeable interpretation of the site at the time the accident occurred. The situation does not warrant a conclusion that it was "An Act of God". It is a man-environment incident.

Tornadoes

Of the climatic happenings that take place in our environment. Tornadoes would fit most of the guidelines or requirements for an Act of God event since they are sudden and unusual. Perhaps, at least in Indiana. Tornadoes appear to be the most feared of our weather. Indiana, by record, has more than its share of tornadoes when compared with other states and it might appear that some areas in the state are more susceptible than others. There is no justification to believe that some areas are exempt from this hazard. Earlier, it was the custom of farm homes to have as part of the living facility a storm cellar, literally a hole in the ground, to wait out the storm. Today few such shelters are built unless associated with bomb shelters under a civil defense program.

Agee et al(5) report only two counties in Indiana without a recorded tornado in the period 1916-1968 but at the same time a record high of 24 in Porter County for the same period. Where recorded, the path of surface contact for the tornado is well described and measured. The longest of record is 121 miles and is known as the Monticello tornado of April 3, 1974. That same date, Indiana also experienced 20 other tornadoes, the record for any single day.

Since 1968 tornado records now indicate that every county in Indiana has experienced a tornado and Porter County continues to be the leader in the number of occurrences. Recorded injuries in tornado periods appears to reflect in part the disbelief of the energy of such a storm.

In spite of the events in a tornado and the response of disbelief by people it is difficult today to consider even a tornado an Act of God. Weather bureaus, meteorologists, civil defense groups, storm watchers and scientific investigations have provided so much that the element of surprise and the nature and intensity of the storm as well as its approximate path is often known before it strikes.

Other Climatic Hazards

The hazards of climate include such features as fog, hail, blizzards, drought, heat, cold, windchill, and the yet to be measured effectively, anti-human regime including monotony. The latter item most would deny but in the practical way human behavior under certain climatic conditions (excessive cloudiness, lack of sunshine) can be related to retail sales, automobile accidents, anti-social actions and crime.

Conclusion

A climatic event considered as an Act of God seems to be a way out for those wanting to ignore their obligations or failings. To those bringing such cases into litigation it seems directed to an "either or situation". If the case can be judged that it is in no way a product of human action and no explanation or scientific interpretation can be provided to the court, "An Act of God" may well prevail. It is doubtful that some explanation can not be found but some wish to concede that all natural events are of a divine nature the acceptance of which is to be used at the convenience of those involved.

From time to time judicial decisions have provided stepping stones to the understanding of the place of climatic events as part of the environment and not part of a mystic. A decision has already been made that rainfall intensity is not an Act of God. For those in Indiana who have experienced a rainfall of 2″ in five minutes this might cause some concern.

In reviewing a number of cases in which the culprit might be considered some feature of climate it appears that several options might be involved:

1. Use of climatic statistics as background information of the environment in which an incident occurred.
2. Use of climatic data to prove that climatic conditions was a contributing factor to an incident.
3. Use of climatic information to prove "An Act of God".

Two events of national importance have surfaced in the courts relating to climatic events. The U.S. Weather Bureau and its personnel were ruled against in a multimillion dollar suit on the basis that they failed in providing sufficient warnings about a storm which resulted in the loss of life of two fishermen. In another case action is promised because sufficient warning was not provided of extreme turbulence. A plane flew into the disturbance and crashed, killing nearly all aboard. These cases would indicate whatever the cause of a storm, man is expected to know about it and has the facilities to make the observations and forecasts to protect life and property. Whether the storm was an Act of God or not, the implication is strong that man has the technology to provide sufficient warnings.

Several hazards once considered as part of the Act of God have been handled by insurance companies in appropriate ways. Within reason, hurricane insurance is available as well as hail insurance in well defined areas. However, most purchasers of insurance covering property would do well to note that unless specifically stated many natural hazards are not covered. From the cases observed, it might well be better to remove the phrase "Act of God" from the law and update the wording to clearly identify natural hazards with a complete understanding of what the potential happenings could be. The proverbial remark "it's raining cats and dogs" may be a hazard of great improbability but is not "An Act of God".

Notes

1. American Jurisprudence pleading and practice forms the section devoted to Act of God has the essential features noted here. Earlier editions did not note the

fourth item referring to the matter of expected warnings and forecasts by the usual government agencies. The tendency to hold them liable for forecasts or the correctness of forecasts. It is a recent development.

2. Although the words unusual or unexpected are frequently used, their quantitative value is not defined and may well be at the convenience of those making judgements.
3. In this section as in other sections, the referral to innumerable climatic statistics from a wide variety of sources would best be authenticated by noting that each worker would utilize publications available for his area. Long time records by the U.S. Weather Bureau, cooperative weather stations, NOAA publications and other papers. In Indiana one would inevitably turn to Visher, S.S., climate of Indiana (1944) as well as the large number of papers published in the proceedings of the Indiana Academy of Science.
4. Although actual cases in which the author has been involved are cited here, the comments are the judgement of the author and therefore, exact names, places and dates are omitted.
5. Keyser, Dennis, A., Agee, Ernest M. and Church, Christopher R., *The Modern Climatology of Indiana Tornadoes* 380-391 the proceedings of the Indiana Academy of Science Vol 87 1977.