

RISKS AND THE PERCEPTION OF RISKS IN A CHANGING SOCIETY

INTRODUCTION

In 1976 an interdisciplinary study on risks and risk evaluations was inaugurated in Sweden and was sponsored by the Committee for Future-oriented Research. One of the basic assumptions of the Swedish risk project was that modern society has created "new, increasingly complicated and large-scale technical systems." It also assumed that "large systems are economically efficient, but vulnerable and therefore create risks." A third assumption was that "the ever rising standard of living is purchased at the cost of certain additional risks." The perspective of the project was thus markedly historically oriented.¹

Already in the presentation of the project in 1976, there was thus the preconceived notion that modern society exposes the individual to additional risks, risks which the individual cannot

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¹ The head of the project was Professor Lennart Sjöberg, Department of Psychology, University of Göteborg. The author of this paper was asked to enter the project in order to analyse long-term societal change in relation to risks. The reports of the project have been published in Swedish and also to some extent in English.

Risks in a Changing Society

determine and which are set in motion as a result of decisions taken within public or private organizations.

As opposed to this general opinion, a different one may be offered, which was published at almost exactly the same time. In an article in a Swedish newspaper, *Arbetet*, in 1976, the physicist, Professor Torsten Gustafson, wrote that the theory that there had been an increase in risks in modern, technological society seems to have been generally accepted, but if the risks are measured over time in terms of the number of accidents with fatal consequences, we would find that the risks have continually decreased from 1860 up to the present. Gustafson concluded: "the accident risk, therefore, instead of increasing, has actually decreased by about 25 percent. Contemporary society, formed by the natural sciences, medicine, industry and technological inventions, is less prone to risks than any that has ever existed hitherto." One theory stands against the other. Who is right? Have we, since the middle of the 19th century, been on our way into a society with more risks or less risks? The question is fundamental and a challenge to historical research. Only a tentative attempt to find an answer will be made here.

If an attempt is made to measure long-term changes in the risk panorama at a national level, then the statistics of total accidents may be used as an *indicator*. The total number of accidents with fatal consequences should be related to the total number of deaths and, by means of the death ratio, to the population trend in the country (diagram 1). Diagram 1 is illuminating in several respects. The two years 1861 and 1950 stand out as two extreme points in a time series which demonstrates a slight fall in the 1920s, after which there is a slight increase in the number of fatal accidents and suicides. Gustafson's theory about a less risky society may therefore be refuted. The decline in risks benefited people during the interwar years, while the present generation faces a slight increase in fatal risks due to accidents.

More striking, however, is that the differences are so small and that during the whole period there is a constant rate of approximately 40 accidents per 100,000 inhabitants per annum. The conclusion to be drawn from this, when working at a macro-historical and national level, is that fundamental structural

changes in society have not, on the whole, had any great influence on risks in society as measured by fatal accidents.

It would be interesting to find out if this rate of accidents, which has, on the whole, been virtually stable for a period of nearly 100 years, is unique to Sweden, or if it has parallels in other countries with similar living conditions, i.e., in the industrialized Western world.

It is not altogether easy to collect comparable data for such a long time series as that covered by the Swedish statistics. But some constructed series from England and the Netherlands show that the development in northwestern Europe has had a comparatively similar stable risk rate—if the effects of the Second World War, which have been included in the statistics of the Netherlands, are excluded (diagram 2). Fatal accidents are highest in the USA and Italy at the beginning of the period, but these countries gradually become increasingly “safe” societies—a reservation for the war being made here too.

All countries except the USA show a slight increase in fatal accidents during the 1960s. It is also puzzling to find a concentration of this indicator at around 40-50 per annum after the Second World War. Does this mean a convergence of the risk rate with the establishment of welfare-states in the Western world?

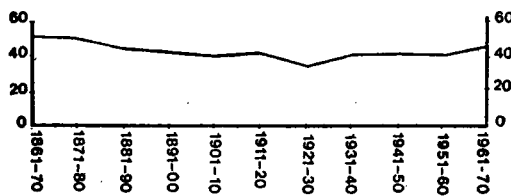
It is obviously not possible to explain this remarkable phenomenon by means of the aggregate figures upon which national curves are based. But it is important to bear in mind what has been termed as the possibilistic theory for the relationship between man and nature.² The human experience of risks in nature leads to social arrangements which successively reduce these risks. At the same time, new technology creates new threats to human life, leading to new experiences which are analysed in order to reduce these new risks. A mechanism of this kind obviously requires a long time in order to operate.

² Harold and Margaret Sprout, *Man - Milieu Hypothesis in the Context of International Politics*. Princeton, New Jersey, 1956; Harold and Margaret Sprout, *The Ecological Perspective on Human Affairs*. Princeton, New Jersey, 1965; E. A. Wrigley, “Changes in the Philosophy of Geography” in R. J. Chorley and P. Haggett, eds., *Frontiers in Geographical Teaching*, London, 1966; Anne Buttimer, *Society and Milieu in the French Geographical Tradition*; Chicago, 1971.

Risks in a Changing Society

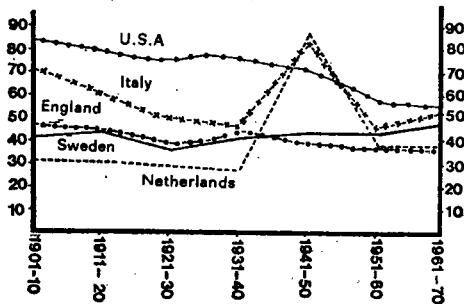
We may therefore only observe this phenomenon from a long-term, historical perspective.

1. THE NUMBER OF FATAL ACCIDENTS IN SWEDEN PER 100,000 INDIVIDUALS. ANNUAL AVERAGES, 1861-1969



Sveriges officiella statistik. Befolkningsstatistik.

2. INTERNATIONAL PERSPECTIVE. THE NUMBER OF FATAL ACCIDENTS IN SWEDEN PER 100,000 INDIVIDUALS. ANNUAL AVERAGES.



USA: *The Statistical History of the United States; From Colonial Times to the Present*, 1976. Italy: *Statistiche Storiche dell'Italia 1861-1975*. England: *Office of Population Censuses and Surveys. Mortality Statistics, Accidents and Violence*, 1975. Sweden: *Sveriges officiella statistik. Befolkningsstatistik*. The Netherlands: 1899-1969. *Zeventig Jaren Statistiek in Tijdreeksen. Centraal byreau voor de Statistiek*, 1970.

SOCIAL CHANGE AS A CHANGE IN SCALE

The Swedish risk project emerged from the vague idea of a transition from a small-scale to a large-scale society.³ In historical and macro-sociological research the concepts of small-scale and large-scale society are less frequently used than the concepts of traditional versus modern society.⁴ In this study, small-scale society is identified with traditional agrarian society, while large-scale society corresponds to modern industrial society.

There is a comprehensive literature on this subject, in particular on the problem of how the transition from traditional to modern society occurs. A special field of sociological and socio-historical research concerning modernization has developed since the Second World War.⁵ In competition with this tradition, a strong marxist tradition has elaborated theories of the transition from feudalism to capitalism.⁶

The process of change is generally regarded from an optimistic evolutionary perspective. Development has been considered as synonymous with progress, the goal of which is the welfare state. Research on the modernization process has frequently been carried out with the declared intent of offering traditional societies in developing countries models and patterns for speeding up the

³ The concepts are frequent in anthropology, but have gained extended use only recently. See L. Kohr, *The Breakdown of Nations*, London, 1957; E. F. Schumacher, *Small is Beautiful; a Study of Economics as if People Mattered*, London, 1973; R. A. Dahl and E. R. Tufte, *Size and Democracy*, Boston, 1973; Fredrik Barth, ed., *Scale and Social Organization*, Oslo, 1978; J. G. Rice, *Studying the Modernization Process at the Scale of the Locality*, Mimeographed, 1977; and Tommy Carlstein, *Time Allocation, Group Size and Communication*, Mimeographed, 1975.

⁴ Reinhard Bendix, "Tradition and modernity reconsidered" in *Comparative Studies in Society and History*, 9, 1966, pp. 292-346.

⁵ R. P. Appelbaum, *Theories of Social Change*, Chicago, 1970; E. B. Harvey, ed., *Perspectives on Modernization*, Toronto, 1972; E. A. Wrigley, "The Process of Modernization and the Industrial Revolution in England," *Journal of Interdisciplinary History* III: 2, Autumn 1972, pp. 226-259; Peter Flora, *Modernisierungsforschung. Zur Empirischen Analyse der gesellschaftlichen Entwicklung*. Studien zur Sozialwissenschaft, 20, 1974; Hans-Ulrich Wehler, *Modernisierungstheorie und Geschichte*, Göttingen, 1975; Øyvind Østerud, *Utviklingsteori og historisk endring* (Development Theories and Historical Change), Oslo, 1978.

⁶ C. Schuler, *Zur politischen Ökonomie der Armen Welt*. Munich, 1968; W. L. Bühl, *Evolution and Revolution*, Munich, 1970; G. Brandt, "Industrialisierung, Modernisierung, gesellschaftliche Entwicklung". *Zeitschrift für Soziologie*, 1, 1968, pp. 5-14.

Risks in a Changing Society

modernization process, in order to more rapidly distribute the blessings of modern society to non-industrialized countries.

There has been less research on the negative effects of the modernization process. However, critical observers of technologically advanced society—such as Lewis Mumford, Erich Fromm and Jacques Ellul, who approach the subject from different points of view—have pointed out unintentional negative effects in the social constructions of the welfare state and have proposed reforms, just as the obviously negative effects that liberal society once had on individual workers gave rise to attempts at reforms in a socio-liberal or socialistic spirit. The ecology movement and growing fears nourished in the shadow of the atomic bomb and nuclear power have led to an intensified criticism and have broadened the base of groups engaged in it.

Although these critical views on the inherent risks to which individuals are exposed in modern society sometimes present a historical perspective, there does not exist, as far as I know, any systematic study of changes in the panorama of risks over a longer period. The task is of course, gigantic, and permits no more than a mere outline to be attempted here.

The first task, therefore, is to determine the actual starting point, *i.e.*, traditional society on a small scale, and then to describe the relevant changes which have led us into a large-scale society.

The transition from traditional to modern society in Western Europe is usually described in terms of some characteristic, interrelated changes in the course of events, *i.e.*, in terms of some historical processes.

— *Economically*, the transition is determined by industrialization and the commercialization of agriculture, leading to economic development, occupational differentiation, occupational specialization, the use of new technology and the exploitation of new sources of energy. Traditional patterns of decision-making are replaced by economic calculations and future-oriented planning.

The change in scale in this process can be measured by the greatly accelerated increase in the consumption of energy, by an increase in individual consumption, and by a trend towards consolidation and growth in industrial units.

- *Culturally*, the transition is determined by modernization in the broad sense of the word, entailing changes in the educational system, longer education within institutional frameworks, more efficient and wider communication of information, the “democratization” of travelling, increases in political participation, and in the development of public welfare. The role that an individual plays in society is no longer determined by inherited social position but by the class structure of society. The aim of politics is to eliminate differences and to assert equality before the law. The change in scale in this process may most readily be measured by the spread of cultural values and social benefits, by increasing numbers of “participants” in elections, schools, universities, and hospitals; by the expansion of mass communications and tourism; and by decentralized cultural distribution.
- *Socially*, the transition is determined by urbanization and centralization (in the broad sense), which involves internal immigration, concentrated housing, the depopulation of thinly-populate areas, the separation of residence and place of work, and social restructuring. These changes in scale involve, in particular, an increase in the geographic size of cities, attempts at megalopolis formations, increases in the size of communities in thinly-populated areas, increases in the radius of transport networks, and increased commuting. This has led to complicated problems concerning time allocation.
- *Technologically*, the transition is determined by the development of techniques concerning the mechanics of materials which make possible increases in the scale of buildings, transport systems, and the consumption of energy. The elaboration of electro-technology has increased the ability of a few to gain control over systems which previously lay in the hands of many.
- *Politically*, the transition is determined by a shift of emphasis in political power and responsibility from groups whose decisions concern a small area (*e.g.*, parish or county), to groups whose decisions concern a large area

Risks in a Changing Society

(i.e., nation or supra-national units). Problems concerning size and democracy are fundamental and of great interest, and are generally depicted in terms of centralization, as opposed to decentralization, of the decision-making functions of growing bureaucracies, as opposed to few elected representatives.

The determination of risks in the two ideal societal types will be discussed once these indicators of the change from a small- to a large-scale society have been identified. An explicit reservation must be made from the outset, that all generalizations of this kind are doomed to conceal essential differences in the actual course of events and in their spatial differentiation.

THE RISK PANORAMA IN SWEDEN, 1860-1970

It is possible to test the possibilistic hypothesis by breaking down national figures on fatal accidents into component parts, i.e., by analysing the development of each specific sector of the risk panorama. However, we also need information about human perceptions of risks, so that we may determine which risks humans tried to avoid or diminish.

Human perceptions of dangers and risks in traditional society were closely connected with faith, myths and popular customs.

The common prayers read at religious services, and especially the Litany, offer an illustration of how the problem of risks and dangers in human society were treated in official religious beliefs. The Litany had a medieval and Catholic origin, but maintained its position after the Lutheran reformation and was still of importance in the pre-industrial society discussed here.⁷ The following risks for human life and health are stressed:

From pest and famine, from war and strife, riot and discord,
from hail and storm, fire and peril, from a violent death
preserve us dear Lord.

⁷ "Litanian" (Litany) in *1811 års kyrkohandbok*; E. Rodhe, *Svenskt gudstjänstliv* (Swedish Divine Service), Uppsala, 1923.

This view of the risk panorama included first and foremost epidemic diseases, war, bad weather, poor harvests and fires: all areas which can also objectively be identified as fraught with risks.

Certain groups were considered to face special risks with regard to life and health, namely pregnant women, women in childbed, and wayfarers by land or water. There were special prayers for particular occasions that were fraught with risks: for times of war, for famine and scarcity, for contagious diseases, and for storms and tempests. It is clear that these "abnormal" periods of risk were thought of as punishments, as acts of God which were legitimately inflicted on humankind and which could be suffered more easily because they were viewed as punishments which could be endured so as to escape harsher fates. There were also special prayers for persons whose occupations subjected them to risks, *i.e.*, seafarers, fishermen and miners.

Even if the official Christian view was that societal risks were natural and that periods of heightened risk constituted a legitimate punishment, the prolific literature of prayers for private use illustrates two entirely different attitudes toward dangers and risks. A pessimistic view of the world and of human life considers disease, losses and death as a natural state of earthly affairs, *e.g.*, "the vale of tears" brought about by Satan and his followers of evil spirits. Acting in light of this belief, humans tried to reduce risks by doing penance. Against this view was a more optimistic faith concerning conditions on earth, wherein attempts to reduce risks were focused on the mercy of the Lord, *i.e.*, on prayer.

The risk panorama of the Church recurred in traditional, small-scale society in the descriptions of expected accidents treated in medieval legislation. These belonged to the following risk zones: sea voyages, sleigh voyages, fires, wars and epidemics.

Popular conceptions of risks and ways of preventing them were to a greater degree characterized by what we now regard as superstition. Here, the threat was believed to come from invisible forces which had to be placated, or from evil persons whose influence had to be reduced by means of ritual acts. In addition, there were a number of popular beliefs regarding risks to life and health.

Risks in a Changing Society

Although it was believed in traditional society that dangers and risks were part of a divine scheme for salvation, people nevertheless developed various strategies to reduce dangers for the individual and to spread the risks. We can see examples of this in the following review of the various zones of risk and the changes these have undergone.

War presented a recurrent threat to the life and health of individuals in traditional society, which men tried to ward off by means of the feudal system of hierarchically-based allegiances and defences.

In traditional small-scale Swedish society, peasants made local treaties, known as peasant peace-treaties, along the borders in order to reduce risks of death, ill health and economic ruin which were caused by conflicts at the national level.⁸ However, it is obvious that the growth of national integration during the 16th and 17th centuries rendered such treaties more difficult. Losses of human life during the period of Baltic expansion were significant and were suffered by both troops and civilians in the border areas.

Sweden's favourable situation in foreign politics during the past 150 years has reduced the number of deaths caused by war to an insignificant figure in the Swedish mortality statistics (diagram 3). But it is evident that the calculated risks for life and health in the event of a nuclear war are enormous and well-known—the “overkill capacity” of new technology has given rise to an entirely unique situation in a historical perspective.

The collective violence of war has its counterpart at the individual level in *murder and homicide*. Contrary to what is generally believed, the number of deaths caused by murder and homicide has steadily fallen from 1860 to 1950 (diagram 3). During the past two decades a slight increase can be noted, which has been discussed when attempts are made to prove that crime is on the increase in modern society. It is evident, however, that this increase has not reached the level of individual violence that existed in pre-industrial society. Contemporary historical research on the social history of crimes of violence should pro-

⁸ Eva Österberg, *Gränsbygd under krig* (Border Peasants during War in the 16th Century), Varberg, 1971.

vide interesting insights on the pre-requisites of this trend.

The risk of *epidemic disease* was a recurrent and terrible threat in traditional society. The small scale did not afford any protection for individual life and health and the rate of communication was low. It was not until increased knowledge of the role of hygiene had been attained and the state of nutrition had been improved for the majority that the situation was radically changed. When the cholera epidemic of the 1830's and 1850's raged, knowledge about the way the disease spread was so deficient that totally inadequate measures were adopted for fighting and gaining control over it.

What consequences has the transition to a large-scale society had for the risks of epidemic diseases? On the whole, no negative effects have been noted. Effective rules for quarantine and improved methods of exposing the carriers of contagious diseases at an early stage has for the time being eliminated risks for epidemics in modern society. There is no doubt but that the large scale in medical services has increased the chances of effectively combating infectious contagion and of ameliorating the sequelae for its victims. The statistics on mortality demonstrate a rapidly falling trend in contagious diseases (diagram 4).

It is interesting to note the predominant position in the panorama of risks that *the transport and communication system* held as a risk zone for the life and health of people (diagram 5).

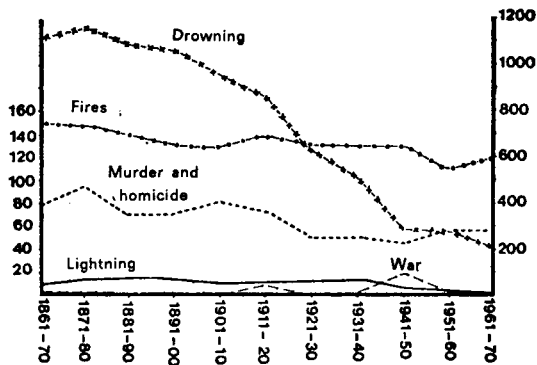
In traditional Sweden, such as it was structured during the middle ages and early modern period until about 1800, the most important means of transportation was by water. Vessels with varying degrees of security traversed the lesser and greater waters. "Behold, we float between the sea and the sky, a feeble plank being all that parts us from death" are the words of a Swedish prayer from the 17th century.⁷ Death by drowning was common when official mortality statistics became available in the middle of the 18th century⁸ (diagram 3).

The increase in population and the struggle for a living in certain coastal areas of Sweden created a social stratum of landless fishermen using open or semi-open boats. Through improved technology, especially the introduction of iron hulls and steam turbines, the risks of drowning during sea transports

Risks in a Changing Society

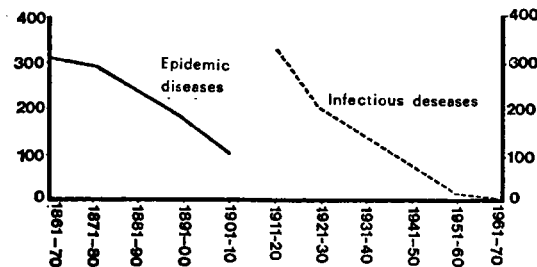
were decreased. This development was particularly striking in the history of passenger transports to the USA during the emigration era. The risks for disasters at sea and individual ill

3. THE NUMBER OF DEATHS CAUSED BY DROWNING, FIRES, MURDER AND HOMICIDE, LIGHTNING AND WAR IN SWEDEN, 1861-1970. ANNUAL AVERAGES.



Sveriges officiella statistik. Befolkningsstatistik.

4. THE NUMBER OF DEATHS IN SWEDEN PER 100,000 INDIVIDUALS, CAUSED BY EPIDEMICS AND INFECTIOUS DISEASES. ANNUAL AVERAGES.



Sveriges officiella statistik. Befolkningsstatistik.

health were much greater during the 1850s when sea transportation took place in sailing vessels, than fifty years later when steamships were used and social legislation was passed that aimed at protecting poor passengers from discomfort.⁹

It is clear that there was a correspondent increase in scale with technological changes in sea transportation. An increasing number of passengers could be transported with each voyage. This development towards an ever-increasing scale continued until 1912, when the sinking of the Titanic broke the trend. The managing directors of the great transatlantic shipping companies subsequently believed it unlikely that people would continue to accept a large-scale threat of death in passenger ships, where hundreds of individuals might perish on one and the same occasion. It would be possible to carry out a more intensive analysis on the size of scale and its relation to disasters and to individual reactions, as well as studying management behaviour and passenger reactions. To my knowledge, no such study has been carried out.

It would also be worthwhile to examine whether competition from a growing air traffic made oversized passenger ships economically unfeasible. In the development of air traffic, the pattern of improved technology, growing numbers of passengers, and increased speed was repeated. As yet, no trend-breaking disaster has occurred, but debate about the Concorde aircraft also addresses aspects of risk, and may eventually result in a break in the trend toward ever-increasing scale.¹⁰ The serious accidents of airships that occurred during the 1920s also had a deterring effect, breaking off the development of that type of large-scale transport, which has today once more begun to attract interest.

The development of internal aviation in Sweden was very fast, both in the private as well as the state-subsidized sector. The number of kilometers per passenger, estimated in thousands, increased from 180 during the period 1931-1935, to 17,023 in a single year, 1950. During the past twenty-five years, that

⁹ N. R. P. Bonsor, *North Atlantic Seaway*, I. Lancashire, 1955; Eric W. Fleisher and Jörgen Weibul, *Viking Times to Modern*, Göteborg, 1953; Nils William Olsson, *Swedish Passenger Arrivals in New-York 1820-1850*, Stockholm 1967; Kristian Hvidt, *Flugten till Amerika* (The Escape to America), Aarhus, 1971.

¹⁰ R. Wiggs, *Concorde: The Case Against Supersonic Transport*, London, 1971.

Risks in a Changing Society

figure has probably risen still higher. The increase is exponential at the same time that aeroplane passenger capacity has increased markedly. There has thus been a significant increase in scale.

Mortality statistics show a rise in the number of aircraft accidents within the country.¹¹ However this increase must be seen in relation to the enormous increase in the volume of travelling. Even if individual aircraft disasters have had very serious consequences, air travel is still considered by passengers to be relatively safe.

The means of transportation used on roads in traditional society was the horse. Originally used for riding and as a pack-horse on poor routes between different settlements which were isolated by forests, the horse provided a means of transportation that represented communication on a very small scale. The change to transportation by carriages and stage-coaches brought about an increase in scale, both in a growth in the volume of travel, and in an increase in distances covered.¹² A transportation system was developed which was built on the exchange of horses at certain inns, and which was administered to some extent by the state. Naturally, there were serious accidents with horse transports, but we have little or no information about the accident rate during earlier periods. As of 1881, however, statistics are available concerning deaths caused by bolting horses, tilting carriages, or from being run over. The numbers are very low and show little variation. The increase that occurs up to 1911-1920 is presumably caused by the introduction of motorcars on the roads: an innovation which frightened horses and caused them to bolt. This, however, remains speculation until available sources have been subjected to further analysis.

Railroads during the 19th century, and motorcars and buses during the 20th century, were two different technical developments which revolutionized road transports during two different time periods.

The railway system in Sweden was constructed during the period 1856-1928, after which it had, generally speaking, been

¹¹ *Kungl. Luftfartsstyrelsen. Årsbok för år 1961 ff.*

¹² A study on the increase in land transportation in Sweden is under preparation by Göran Andolf, *Militärhistoriska avdelningen*, Stockholm.

extended to maximum size. The transition to railway traffic was preceded by a heated public debate, but the risks discussed were not conceived in terms of threats to human life and health, but rather as economic risks, particularly of the risk of theft of rails and carriages.¹³ It is, on the other hand, possible to identify in private sources, frequently voiced expressions of fear, with reference to high speeds. For example, a diary from 1857 gives a representative account of the general beliefs in Sweden at that time:

You are locked up in a carriage or a kind of cupboard, in which you, while surrounded by smoke, dust and deadly peril, roll on at an incredible speed from one station to the next. It is not possible to see anything during the dangerous journey, so that it is not until one has arrived that it is possible to discover what part of the world one has come to.¹⁴

As is well known, the first rail carriages were constructed like extended stage-coaches, creating the impression that it was these old familiar kinds of carriages that had grown larger and had developed a new and dangerous speed.

Despite these initial expressions of fear, there was a low rate of railway accidents. Mortality statistics provide the following information: after an initial period of rising numbers of deaths that coincide with an increasing volume of travel, there follows a period of sharply increased travel without a corresponding increase in the death rate. Thus, the risks have diminished despite an increase in scale.

The fear of railway journeys proved to be short lived and the source material does not reveal any changes in attitudes toward railway traffic even after serious accidents. This is in part due to the fact that some of the worst accidents, for instance, the Geta disaster in 1918, occurred at a time when there was no real alternative to railways for the great majority. It should also

¹³ Sverker Oredsson, *Järnvägarna och det allmänna. Svensk järnvägspolitik fram till 1890* (The Railroads and the Public Sector. Swedish Railroad Politics before 1890), Lund, 1969; Ingemar Norrlied, "Review of Sverker Oredsson: *Järnvägarna och det allmänna*," *Statsvetenskaplig tidskrift*, 2, 1971, pp. 193-210.

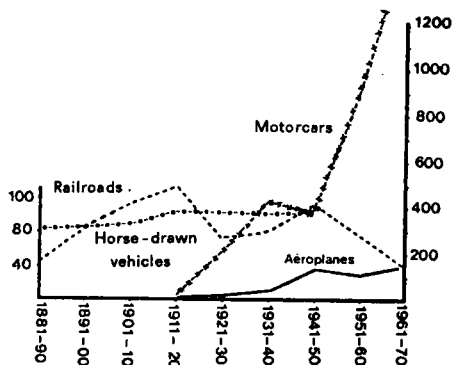
¹⁴ Angelica Peyron, *Några anspråkslösa Minnesblad från Fremmande Land*. Manuscript in the Archive of Mrs A. Lindencrona, Stockholm.

Risks in a Changing Society

be noted that most of the mortal victims of railway accidents were railway employees. The risks that the general public faced by using this means of transportation were insignificant. Official railway statistics for 1913, for instance, show that there were only 0.53 accidents per one million travellers, and that less than one third of these had fatal consequences.¹⁵

The transition from the use of horses to motorcars in road transportation was experienced as a significant environmental improvement in the big cities. Pollution by horses was a much greater problem than pollution by the same number of combustible motors.¹⁶ However, there was also debate about the risks that the new technology involved, especially concerning high speeds on bad roads. In Sweden, the number of cars increased from 3,036 in 1916, to ten times as many as early as 1921. Diagram 5 demonstrates an enormous increase in the number of deaths caused by motorcars. The decrease in risks which gradually occurred in railway traffic does not seem to have any corresponding parallel in motorcar traffic until recently.

5. THE NUMBER OF DEATHS IN SWEDEN THROUGH ACCIDENTS CAUSED BY HORSE-DRAWN VEHICLES, RAILROADS, AEROPLANES AND MOTORCARS. ANNUAL AVERAGES.



Sveriges officiella statistik. Befolkningsstatistik.

¹⁵ *Allmän Järnvägsstatistik*. SOS. K. Wallberg, "Riksmätning vid trafik-äkerhetsforskning," *Statistisk tidskrift*, 1958.

¹⁶ Måns Lönnroth *et al.*, *Ska vi asfaltera Sverige?* (Do We Want to Asphalt Sweden?), Stockholm, 1971.

The compulsory safety belt of the last few years has turned the trend downwards.¹⁷

The increase in the number of deaths caused by motorcar accidents on the roads must be seen first and foremost as a consequence of changes in the economy of major groups in society: increases which permit investments in motorcars as a private means of conveyance. The motorcar represents the definite breakthrough in road transportation. Its personal advantages are experienced as so great that the obvious risks are apparently held to be a reasonable price.¹⁸

A special type of increase in scale may be studied in the development of public road transportation, *i.e.*, in bus traffic. Inter-urban traffic had its breakthrough during the 1920s but primarily serviced densely populated areas. As of the end of the 1930s, there was a gradual change that was partly a consequence of measures dictated by traffic policy, and which gave sparsely populated regions most of the public transportation services.¹⁹

Low-income groups in society also obtained better opportunities for road communications through public road transportation systems. The techno-social increase in scale has, in this case, led to an apparent decline in risks, because public motor traffic is generally safer than motor cars. On the other hand, there now appears to be a rise in risks from the movement of people between bus stops and their homes, as compared to the equivalent movement between garage and home. However, there is no way of analysing this historically, since source material dealing with bus traffic is very sparse.

It is within the transport sector that we find the first systematic attempt at risk allocation based on risk determination.²⁰ This took place within shareholding systems and

¹⁷ *Trafiksäkerhetsverket. Arsbok 1980. SDS 1-2-1981*; S. Groth, "Statistiken över vägtrafikolyckor." *Statistik tidskrift*, 1956.

¹⁸ Ola Svensson, "Risks of Transportation from a Psychological Perspective: A Pilot Study." Mimeographed. *The Risk Project Report 3-77*.

¹⁹ Sven Godlund, *Busstrafikens framväxt och funktion i de urbana influensfälten* (Bus Traffic, its Development and Function in the Urban-influenced Areas), Lund, 1954.

²⁰ J. E. Post, *Risk and Response*, Lexington, 1976; O. Bucht, *Försäkringsväsendets företagsformer från antiken till våra dagar* (The Entrepreneurial Forms

Risks in a Changing Society

shipowners' associations, which later developed into marine insurance pools. It is characteristic that the oldest measures concerning the allocation of risks aimed at the distribution of economic risks. Life insurances and insurances against accidents for travellers and for those employed in the transport sector are late attempts to diminish the consequences of risks to life and health.

Attempts to minimize risks in the traffic sector have been made by means of various road-safety campaigns and measures. In 1956, a department for traffic security was established in order to stop an increasing trend in traffic accidents.²¹ An increase in traffic intensity caused by increased geographical integration and the democratization of travelling in society, has also made socio-economic demands on public welfare which are well known from current debate. Several social Utopias have therefore been projected which take as a starting point a need to lessen the demand for communications by deliberately trying to diminish the scale of the area in which people live and work. In the future, when motor fuel costs will increase as a consequence of oil shortages and the pricing policy of the oil-producing nations, it will also be necessary to consider a gradual reduction of private motorcar traffic.

In conclusion, the repeated decrease in accidents in the transportation sector, as registered for different sectors in society, is due to technological improvements in combination with legislation. Individuals are for various reasons apparently able to accept a rather high level of risks in the transportation sector, and only by means of collective actions are restrictions on the risk factor carried out.

Other sectors of the risk panorama also give the impression that the possibilistic hypothesis offers a good explanation: the sectors combined indicate that human society functions in such a way that risks have, in the long run, been eliminated.

of Assurance from Antiquity to Modern Times), Stockholm, 1936; B. Bergander, *Försäkringsväsendet i Sverige 1814-1914* (The Assurance System in Sweden 1814-1914), Stockholm, 1967.

²¹ Trafiksäkerhetsarbetets organisation m.m. Betänkande avgivet av organisationskommittén för trafiksäkerhet 1958. Trafiksäkerhetsverket. *Arsbok. Trafiksäkerhet — problem och åtgärder*. Betänkande avgivet av trafiksäkerhetsutredningen, DSK, 1980:6.

The risk zone of *fire* has also undergone a great change over time (diagram 3). Wooden housing in both town and countryside made the risk of fire acute. Rules and regulations regarding fires and the kindling of fires were set up at an early stage in laws, statutes and village by-laws. Fires in towns were especially devastating since housing there was so congested. Accounts of fires seldom refer to human losses or to disablement caused by these violent conflagrations. But obviously these events must have exacted a human toll. Mortality statistics, however, demonstrate a falling trend. The explanation for this reduction of risk of death caused by fire is to be sought in extensive collective measures of action. Town planning was implemented with fire breaks, regulations concerning the construction of buildings, fire watchers and fire brigades. In the countryside, land-parcelling reforms meant that densely populated villages were broken up, thus reducing the risk of fires. The development of fire-resistant materials was also important.

Already during the middle ages, the disastrous consequences of fires in the countryside had led to legislation concerning "risk-pooling" in the event of fire. This meant that those whose houses were destroyed by fire could turn to every other household in the district and obtain contributions from each in the form of both grain and money for reconstruction. This extensive collective responsibility was weakened in practice as a result of the formation of parochial indemnities. These indemnities were less efficient, but apparently corresponded more closely to the peasant population's conception of greater security on a smaller scale. Towns, however, lacked indemnities for loss by fire, which resulted in the early establishment of fire insurance companies and commercial businesses. Such collective firms became increasingly attractive to groups in the countryside who did not own soil and who were therefore excluded from the indemnity system which was linked to ownership of taxed land.

It is clear that modern, large-scale and technologically-advanced society has rapidly and efficiently reduced the risks to life and health from the hazards of fire. A combination of fire-proof construction materials and increased measures for local fire protection has reduced the scope of disasters. Up to the present,

Risks in a Changing Society

the ever-increasing size of buildings in cities has not led to increased life or health risks from fire. Health hazards due to cheap plastic materials, which have been discussed in recent years, have apparently been controlled by means of various legislative acts and measures because increases in fatal accidents have not been reported.

A similar development in the risk trend can be noted with regard to the most common of natural catastrophes: *thunderbolts*. The number of deaths due to such accidents has, on the whole, undergone a downward trend. In this case too, technological development has facilitated an increase in the scale of buildings without a corresponding increase in the risk of disasters caused by flashes of lightning.

Natural catastrophes common in countries with different environmental conditions, such as floods, landslides, earthquakes, and tornadoes, have been rare and limited in scope in Sweden, and therefore do not need to be treated in a historical perspective. Harvest catastrophes due to such climatic influences as frost, hail, and storm, which in the past had serious consequences, and which often led to high mortality, were brought under control during the 19th century by means of improved harvests on the one hand, and by more efficient means of transportation on the other. The last great famines in 1867-1868 struck the province of Norrland in particular. The consequences were serious since the railway system had not yet been extended to those parts. But since the increase in agrarian production and the development of the transport sector, the risks of death caused by famine have been reduced in Sweden.

CONCLUSION

It has not been the aim of this historical survey on changes in the risk panorama to present well-documented studies on this topic. It is instead a preliminary and tentative study, the aim of which is, by means of readily available statistical sources and the sparse literature that exists on the subject, to attempt to structure the problem so that it may lead to further research. The outcome of the study has thus been to articulate problems

and formulate hypotheses, rather than to reach conclusions in a field of history which until now has not been systematically investigated by historians.

By way of summary, one could claim that that profound change of society which is summarily termed modernization, has in no way increased the risk of accidents with fatal outcomes. However, this does not mean that society has become safer. Every sector of society seems to demand its share of accidents. The number of these accidents may vary, but if we use fatal accidents as an indicator, then the totals are roughly equal to changes in a more general perspective. The explanation for this finding may be that technological change creates ever new resources to minimize risks, while developments in transportation technology simultaneously increase the risks taken by individuals. This preliminary study of the distribution of fatal accidents across risk zones and risk groups suggests changes of great interest. These changes, however, require new and more profound historical study in order to be more fully analysed and explained.

Increased historical research on problems concerning risks, the determination of risks and the behaviour of humans when confronted by risks, should thus, from a longitudinal perspective, lead to an understanding of human conditions in society and the way that humankind has coped with the challenge of sudden and premature death caused by accidents.

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