

I R C O B I

International Research Committee on Biokinetics of Impacts

Bertil Aldman M.D.

Chairman

Professor of Traffic Safety

Chalmers University of Technology

Göteborg, Sweden

Abstract.

Transport accidents represent a world-wide problem of grave dimensions, of concern to all countries using and producing motor vehicles.

To approach this problem IRCOBI was formed.

The members are active research workers concerned with the lack of knowledge in this field and who realize that the problem of transport safety is an international one.

The aims of IRCOBI are to encourage the exchange of information and the planning of co-operative research at an international level on biokinetics of impacts over the next ten to fifteen years, with particular emphasis on improving the scientific information on which safety standards and the planning of ground transport safety should be based.

The process of motorization in road transport which can be traced back almost a hundred years was slow at the beginning. However, at the end of the first World War the automobile had proved to be useful for large scale transportation. During the period between the two World Wars the general public began to realize that the automobile was an alternative means of transportation with promising qualities, automobiles became available to more people and the modern road system began to take shape. After World War II motorization of road transport increased at very high rate.

The differences in social, political and economical systems as well as in climate and population density resulted in development along slightly different lines and at different pace in various parts of the world. A consequence of this is that the number of motor vehicles per capita and the mixture of types of vehicles on the roads are not the same everywhere. As a result, each country has its own distinctive pattern of accidents. But we all share the same general experience, that the motorization of road transport has led to an alarming increase in the number of road accidents and in serious injuries to road users.

For a long time this was not a matter of great concern to the authorities. The attitude among people was rather to consider the loss of human lives and wellbeing in road accidents as the toll we have to pay for the convenience of modern road transport.

A few researchers, however, had begun to study the epidemiology of road accidents and methods of injury reduction in certain types of accidents and so information began to accumulate which indicated that a great deal can be done to reduce both the number and the severity of road accidents. By the middle of the 1960's the public opinion had changed and the authorities in different countries were ready to act.

In 1966 the United States Congress enacted two safety Acts which among other things provided the authority to issue Federal motor vehicle safety standards. These Acts were signed by the President of the United States on September 9, 1966.

In October 1966 the Council of the Organization for Economic Co-operation and Development (OECD) decided to set up a working group which was to concern itself with questions of automobile safety and, in particular, with problems resulting for OECD member countries from pertinent legislation in the United States.

A letter of May 31, 1967 to the President of the European Conference of Ministers of Transport emphasized the need for international co-operation in steps aimed at improving the safety of vehicles by technical requirements and appropriate harmonization of the relevant national regulations.

Other inter-governmental organisations which undertook activities with regard to technical safety requirements in vehicle construction were the following.

The Council of Europe, which in its Recommendation 413 suggested a study together with competent international organisations to determine recommendations to governments for improved safety in vehicles.

The European Economic Community (EEC) set up a working group under its Directorate General for Internal Market Affairs: Impediments to Commerce resulting from Technical Prescriptions-Motor Vehicles. The improvement of safety on the road has played an essential role in the work of this group.

At the Economic Commission for Europe (ECE) of the United Nations (UN), Geneva, its Inland Transport Committee and Sub-Committee on Road Transport a group of Rapporteurs on general Safety Provisions was created in March 1967 to give priority to the study of problems involving the external and internal design of vehicles which have a bearing on the safety of traffic. The Sub-Committee suggested that in this study account should be taken of the safety standards which had then become operative in the United States of America.

In 1968 the Organisation Economic Co-operation and Development (OECD) decided to set up, within the framework of its Road Research Programme, a Research Group S 1 on Road Safety: Influence of Vehicle Design on Crash Injury. Researchers from the following member countries were nominated for

this group: Belgium, Canada, France, Italy, Netherlands, Sweden, Switzerland, United Kingdom and United States. The title of the group and its report was later changed to "Biomechanics of Automobile Accidents".

The work was completed in October 1969 and the final conclusions and recommendations (DOC/RR 5/S 1/69.10 and RR/S 1/70.1) were submitted to the steering Committee of OECD and received its approval. Five projects of co-operative programs were suggested and the following countries accepted responsibility for the implementation of these projects.

- A. International standard of accident analysis and recording for scientific purposes (Belgium)
- B. Accident kinematics (France)
- C. Human tolerance to dynamic impacts (Sweden)
- D. Car design (United Kingdom)
- E. Biochemical study of road accident victims (not decided)

As a first step in the implementation of program C. Human tolerance to dynamic impacts, an international survey was made of active research projects in this field. The result of this survey showed that much work was carried out in the United States. This was not very surprising to anyone who had followed the literature in recent years. But the study also indicated that an almost equal number of projects were under way outside the United States with Europe in a leading position. To a certain extent this perhaps explains the prompt response at an inter-governmental level in Europe to the Federal Motor Vehicle Safety standards in the United States.

During this study it became evident that the two original programs, on accident kinematics and on human tolerance to dynamic impacts, were to a great extent complementary and partly overlapping. Following some preliminary discussions in Stockholm a small group of active researchers from different countries in Europe met in Lyon, France in September 1971 to discuss the feasibility of combining the two original projects into one dealing with a particular part of biomechanics which could be defined as the biokinetics of

impacts. The group was concerned with the lack of knowledge in this field and realized that the problem of transport safety is an international one.

It was decided then to form an international research committee with the aims:

- to encourage studies on the transfer and dissipation of kinetic energy inside and outside of the human body
- to collect and disseminate information on the biokinetics of impact
- to serve as a reference group to other groups engaged in epidemiological studies and studies on the design of vehicles
- to engage in the training of researchers in biokinetics.

In order to get this work started as soon as possible it was also decided to keep the group as small as possible at the beginning. The combination of the two original research programs for which France and Sweden had accepted responsibility into one much broader joint program made it seem quite natural for the representatives of France and Sweden to set up a committee for the implementation of this new endeavour. It also seemed quite logical that the members of this committee should be chosen according to personal merits and not as representatives for certain nations. As the committee would have to meet at regular intervals and quite frequently it was natural to find most committee members in Europe and to have some members from America, Australia and Asia who would be called to all meetings but for natural reasons would be expected to be keeping contact mainly by correspondence.

This change in the original plans, as expressed in the two OECD documents, were made in close contact with the OECD Road Research Secretariat, which was very instrumental in organizing this International Research Committee on Biokinetics of Impacts (IRCOBI).

As one of the main aims of IRCOBI is to improve the dissemination of information in a very specific field it was decided that this should be done by efforts to stimulate the participation in meetings particularly by younger researchers. One great obstacle seemed to be the fact that the main event in

this field the Annual Stapp Car Crash Conference, a natural meetingplace for researchers in the United States, was for economical reasons out of reach for at least many of the younger European researchers.

A reduplication of the Stapp Conferences on the European side of the Atlantic did not seem to be a very good idea. The question then arose if the problems facing researchers outside the United States were identical to those facing American researchers. In one or two respects there were obvious differences. The proportion of unprotected road users mixing with automobiles in normal traffic seemed to be greater outside the United States and the size of automobiles differed so much that the American ESV program had two projects, one for American size cars and one for smaller cars.

The fact that each country has its own distinctive pattern of accidents and a desire to decide which safety measures are worth requiring on a cost/benefit basis may result in different priorities in different countries. Therefore the efficiency in and international implication of governmental implementation of motor vehicle safety standards is of great concern to many researchers who fear that the lack of knowlege on human tolerance may eventually lead to abuse of results which are not generally applicable.

In discussions along these lines the IRCOBI came to the conclusion that it would be desirable to arrange an international Conference in Europe to review knowlege on human tolerance to impact, as revealed by accident investigations, experimental work, and experience from currently used, protective devices. It was also decided that the Conference should be divided into nine subject areas and that following the main Conference there should be three workshop sessions and a closing session.

The interest in this Conference as expressed by the number and quality of papers offered for publication has been much greater than the Committee had expected.

So far the IRCOBI has been an ad hoc group for the implementation of a program for international co-ordination and co-operation in research on the

biokinetics of impacts. This meeting is a first step in this direction, what the next step will be will largely depend upon the outcome of this Conference. The IRCOBI has a desire to be instrumental in the exchange of information on research projects at an international level in liason with other organisations. Perhaps we can best serve this purpose by remaining a group of people who are concerned with the lack of knowlege on human impact tolerance and who are convinced that transport safety is an international problem.