

# LAW AND STATE

A BIENNIAL COLLECTION  
OF RECENT GERMAN CONTRIBUTIONS TO  
THESE FIELDS

VOLUME 13

A SERIES ISSUED  
IN THE SERVICE OF SCIENTIFIC CO-OPERATION

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Edited in Conjunction with  
Numerous Members of German Universities  
and Research Institutions by the  
Institute for Scientific Co-operation

INSTITUTE FOR SCIENTIFIC CO-OPERATION

Tübingen, Landhausstr. 18  
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# RATIONALIZATION AND AUTOMATION IN THE FIGHT AGAINST CRIME

by

HORST HEROLD

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The tasks and the workload of the police have been currently increasing over the years; its manpower has, however, not been re-inforced at the same rate. Whenever a given complement of staff is expected to do more work, there is need for rationalization, i. e. the tightening and shortening of work routines, the concentration of emphasis and a re-allocation of responsibilities; these are indeed familiar measures taken by commercial enterprises intent on maintaining efficiency.

Thinking along these lines, the police authorities have come to realize that, in its fight against crime, a police force constitutes a vast data processing project. The search for clues at the scene of a crime, the carrying out of criminal investigations, the interrogation of witnesses – these all involve the collecting, recording, storing, processing and putting together of dates and data. This is shown very clearly by the files of the Bundeskriminalamt (Federal Criminal Investigation Department), whose legal responsibility it is to provide an information service to the Federal Police in the Federal Republic of Germany and for international communication. In the year 1971, the vast filing systems and card indexes contained 28 million fingerprints, 2.8 million criminal records, 3.5 million photographs, and more than 6 million documents of all kinds, which had to be processed slowly and laboriously by hand, using conventional methods, and were expected to provide the answers to some five thousand enquiries per day from Germany and abroad. The material increased, and continues to increase, by about 8% per annum; the information service was literally buried under the avalanche of material; the Bundeskriminalamt became practically paralysed. The situation of the Landeskriminalämter (Land Criminal Investigation Departments) was similar, although it assumed different forms.

In these circumstances attention naturally turned to possible ways of automation, i. e. of getting machines to do routine repetitive jobs previously done by men. A possible solution was electronic data processing, which has the important ability, from the crime control point of view, to analyse

in depth and interlink logically all stored data, collected in practically unlimited quantities. Consequently, on 28th January 1972, the Ständige Konferenz der Innenminister des Bundes und der Länder (Standing Conference of Federal and Land Ministers of the Interior) decided to set up, at the Bundeskriminalamt as central office, an electronic information system, based on the cooperation of the federal authorities and the Länder, for the purpose of meeting all the information requirements of the police. As early as November 1972 the police information system, INPOL in short, was able to start operation as a system for tracing wanted persons. In other words: the conventional printed lists and records giving details of wanted persons were replaced by electronic data storage accessible to distant users.

Since then, the INPOL system, planned and directed by police officers of the Federal government and the Länder has made impressive progress. Some Länder have a direct link with the central computer at the Bundeskriminalamt via their own Land telecommunications network, whereas others are connected to it by their own data-processing installations made by various manufacturers. Although the needs and engineering possibilities or facilities of the various Länder differ very widely, this diversity has been transformed into an efficient unified system by the network of approximately 60,000 km of cables which have been laid so far. The number of terminals, i. e. of display units on which information transmitted by the centre can be viewed as on a tv screen, now amounts to 700 but is to rise to 1200 by the end of the year. Arrangements have been made by the Federal Government and the Länder for providing a final figure of 8000 to 10,000 terminals, which means that every superintendent's office, police station, frontier post, airport departure lounge, and sea port will be equipped with terminals which give the officer on the spot access to all available police information within a few seconds. The terminal as an instant source of all information required by the police will then become more important than conventional means of telecommunication, such as wireless, telex or telephone. Moreover, the central computer can be interrogated by subscribers of the public and international telex system, provided the centre has given them the necessary top secret code number. Even today, the latter possibility facilitates the internationalization of the information service provided by the data banks of the police in the Federal Republic of Germany, to which access can be obtained from any point on earth. This proved to be extremely useful, for instance, after the terrorist attack on the German Embassy in Stockholm when Swedish national police had to check whether any German car in Sweden had been stolen in the Federal Republic of Germany; for this purpose, the Swedish national

police had direct access by telex to the data collection on "stolen vehicles" of the computer at the Bundeskriminalamt.

The setting up of the INPOL system fundamentally transformed the *tracing and search system of the police*, i. e. the search for wanted persons and missing articles (from motor vehicles to fur coats). In the Federal Republic of Germany, 130,000 persons are wanted by the police for apprehension, deportation, or illegal residence, and, for instance, some 100,000 motor vehicles have temporarily gone astray. These statistics, which give an impression of the amount of tracing and searching the police have to do, reflect the most dangerous crimes of all, i. e. crimes covering a large geographical area and committed by roving offenders. For instance, in 80% of all capital crimes cars are used as a means of preparation, perpetration, or escape, and 90% of these are stolen. Capital crime cannot be brought under control unless the number of stolen vehicles is drastically reduced, i. e. unless stolen cars are successfully traced. Similarly, without an effective tracing system, it is impossible to deal with roving criminals or gangs of criminals operating in an extensive area. Although the importance of tracing and search systems for persons and motor vehicles was universally recognized, the police were unable to make much headway because the search system was so slow and unwieldy. This was the fault of the conventional manual techniques used, which did not even begin to match the influx of data. When a criminal was on the run or the theft of a car was reported, the local police submitted a report of the matter in duplicate through the post to the relevant Landeskriminalamt. The latter first scanned its own files for information relevant to the report, for instance to check whether the wanted person was already known to be staying in town, etc. In the absence of such information, the Landeskriminalamt mailed the report in duplicate to the Bundeskriminalamt. The latter carried out similar investigations at the Federal level. If the result was negative, the details concerning the wanted person or the missing car were first recorded on an index card. Copies of these cards were sent daily to the 90 or so tracing-and-search card indexes in the Federal Republic. Every day, the post office delivered some 500 new accessions and cancellations to these indexes. In this way, some 1000 staff worked on the trace-and-search card indexes in the principal police headquarters, most of them crime squad officers whose sole job it was to keep the card indexes up to date and provide an information service for local police stations. Moreover, the Bundeskriminalamt had the details concerning wanted persons or missing motor vehicles recorded in various trace-and-search files. In this way, the data passed through a complicated editing process to ensure that names were checked for correct spelling, and that data were arranged in uniform

order and then set up in print by the Government Printing Office. To allow the wanted persons file to be printed on the first of the month, the last entry had to be submitted on the 15th of the previous month. After printing, from 5000 to 15,000 copies of the files were distributed through the post to the police stations. Individual issues of these publications weighed between 600 g and 1.5 kg and were unsuitable for use on the policeman's beat if only because of their weight and bulk. The effect of the enormous time lag on efficiency was far more serious. At best, three weeks elapsed between the date on which a lawbreaker was reported to have absconded and the publication of the wanted persons file containing his name. As a rule, this time lag was six weeks so that the missing persons files could only be used with the utmost discretion. Not infrequently, persons were wrongly arrested because of obsolete entries in the wanted persons file. In the tracing of stolen cars, where quick action could make all the difference, the time lag between the event and its recording in the file frequently amounted to several months.

Use of the INPOL system reduces the tedious and time-consuming procedures described above to fractions of a second. The terminals which are used both for input of data and for information retrieval are simple to operate after a short instruction period. The display units have a keyboard like the familiar typewriter keyboard. For instance, should Munich police headquarters wish to apprehend a man called Huber who has raided a bank, a police officer types out, as on a typewriter keyboard, all the known and relevant data on Huber. What he types appears on the screen in front of him so that he can check and, if necessary, make corrections. When all the information has been typed and corrected, the officer operates a sender key and the item is transmitted by electrical impulses at the speed of light through the lines which connect the terminal with the police computer at the Landeskriminalamt Bavaria and the central computer at the Bundeskriminalamt in Wiesbaden. There, the item is stored the second it arrives, and immediately becomes available to all subscribers to the system. If, at this moment, the wanted man is passing through the departure gate at Hamburg airport to take his seat on the scheduled flight to Copenhagen, and the officer operating the data-monitoring unit at Hamburg airport has typed the name "Huber" for checking, the following information will immediately be displayed on the Hamburg screen: "Huber date of birth 21st September 1933 to be apprehended. Warrant of arrest issued by Munich district court on 1st July 1975 for raiding a bank. File number 7 G 1317/75." If Huber is arrested, the Hamburg police in turn can transmit, via the terminal, the information "arrested", which is immediately displayed on the screen at Munich police headquarters; the warrant of

arrest is transmitted to Hamburg, and the search for Huber in the INPOL system is cancelled. Quick action within the space of seconds improves police efficiency and enhances the ideal of law and order: arrest as a result of obsolete data is made impossible. Moreover, the following should be pointed out with regard to rationalization: the institution of a search, its execution and completion are performed without the paper work, printed lists, and form filling which were the inseparable concomitant of bureaucratic activity from the beginning of time. Now, any data required by the police on any particular occasion appear as shadows on the screen and are extinguished when they have done their job. Accusations of "red tape", the impedimental use of official forms and procedures, are no longer justified.

With the assistance of the INPOL system, 52,000 wanted persons were traced in 1974, while the number of persons wanted rose to 170,000. However, this increase does not signify a rise in the number of roving crimes, but reflects the fact that police authorities increasingly pass all searches to INPOL, including those which previously they refrained from subjecting to the time-consuming procedure of recording in the central wanted persons files because of the predominantly local relevance of the case or in the hope of making a quick arrest. The number of 52,000 persons traced on the other hand does represent a 40% increase in the success rate in comparison with earlier methods. Both statistics, the increased number of persons traced and of searches requested, consequently show that the INPOL system is "beginning to bite" and that the search procedure has become more efficient. The tracing of motor vehicles by electronic data processing only started on a country-wide basis on 1st January 1975; similar trends towards increased efficiency are beginning to emerge. Both Bundeskriminalamt and Landeskriminalämter consequently consider themselves vindicated in holding that it should be possible with the assistance of an efficient interactive computerized information system such as INPOL to deal a fatal blow to roving crime. An efficient INPOL network can reduce the depressingly high trace-and-search statistics to an irreducible minimum, and make a major contribution to the improvement of law and order in the Federal Republic.

Federal and Land Ministers of the Interior soon recognized the importance and significance of the INPOL system and allocated further crime prevention tasks to it. The most important of these are briefly described below.

A central project of exceptional importance is the computerization of *dactyloscopy*, i. e. the automatic storage and mechanical comparison of fingerprints of which 28 million, i. e. the fingerprints of 2.8 million persons,

are kept at the Bundeskriminalamt. Contrary to the commonly held view, dactyloscopy is able to identify a person unequivocally from fingerprints, but the chances of tracing the owner of fingerprints taken at the scene of the crime in the vast collections of fingerprints at police headquarters are very slight. Previous manual methods of searching and comparison did not permit methodical tracking down of isolated fingerprints. Consequently, the success rate of tracing a criminal from a classifiable fingerprint taken at the scene of the crime was no more than 3 to 5 %. The work of searching and comparison was moreover made harder by the fact that five different classification systems coexisted laboriously and uneasily in the Federal Republic. For instance, to check at the Bundeskriminalamt whether a complete set of fingerprints of an accused person confirms that he is the person he purports to be, more than 200 complete sets of fingerprints already in the collection must be compared. In this manner, 72,000 complete sets of fingerprints are processed per day at the Bundeskriminalamt for purposes of comparison by about 80 fingerprint viewers working around the clock.

By attempting to computerize dactyloscopy, experts at the Federal and Land level have embarked upon unification of the system of classification and of the collections, on setting up machine-readable fingerprint data banks, and on the instant identification of isolated fingerprints taken at the scene of the crime. Foreign experience provided no useful model, although much time and money had been spent on the solution of this problem, particularly in the USA. Apparently, German criminalists have succeeded in finding an effective solution to the problem of dealing with fingerprint collections in the Federal Republic. Specially developed instruments are used to project the image of the fingerprint to be encoded onto the screen at a magnification of 1000. The anatomical peculiarities of the papillary lines are translated into mathematical formulae by a special process; the formulae are fed into the computer and used as a means of searching for the identity of the fingerprint. The classification system will allow each individual fingerprint to be exactly described in terms of more than 100 mathematical expressions, replacing the five grammalogues previously used. The enormously increased amount of information obtainable from each fingerprint permits its identification and retrieval in vast collections of data. At present, 100 fingerprint experts at the Federal and Land level are working on converting the Bundeskriminalamt collection of 28 million fingerprints to data processing by the year 1980. Calculations made by a team of scientists showed that, given a data collection of this size, machine identification of a person from his fingerprints can be achieved within the space of about one minute, just as a person can be identified from a single fingerprint obtained at the scene of a crime. Consequently, the success rate



of dactyloscopy of fingerprints taken at the scene of the crime can be increased from 5 % at present to more than 55 %. In future, the police, having taken a fingerprint at the scene of the crime, will encode it and transmit it as a search enquiry to the central computer via the INPOL terminal. The reply with details of one or several potential initiators of the fingerprints will appear on the screen, after a search and processing time of about one minute.

The examples given above show that crime investigators and computers will increasingly engage in a question-and-answer dialogue. This kind of communication is to be perfected in the form of a *documentation system of the entire literature of crime and criminology* and of all expert crime-laboratory opinion, to constitute a special information service for C.I.D. officers. At present, all books, articles and expert opinions published in the literature of criminology and criminalistics are being recorded, giving author, title and reference, and their contents described by a freely selected number of keywords, called descriptors. As a rule, the contents of a technical paper can be expressed by 25 to 30 keywords. To avoid burdening the centre with keyword indexing, steps are being taken to make the authors themselves supply the keywords; they should be the ideal persons to decide which keywords best describe the subject. The entries, stored in the computer, can be interrogated in any desired combination of terms, and the INPOL system can be used to display on the screen for instance all the articles written by a given author, giving titles and references. Another example: In the search for special literature, keywords can be combined at will. For instance, in a literature search for methods of cocaine production the keyword "narcotic" would undoubtedly be too general and would produce a large amount of unwanted material, whereas the keywords "cocaine" and "production" give a general description of the subject which can then be made more specific by the addition of terms such as "laboratory process" or by stating the place of production such as "France" or "Marseilles". At a later stage of development, instant information will be given to the police officer on the spot, by means of the INPOL dialogue documentation system, concerning the latest developments in crime research, such as new techniques of analysing, for instance, human hair, methods of obtaining, transporting, and forwarding hair specimens etc. The intention is to give the officer working at the scene of the crime direct access to the latest scientific developments, thus taking the burden of academic learning off his mind and allowing him to concentrate the full force of his mental and creative energies on the facts of the case. Universities and technical colleges in the Federal Republic have been invited to participate in the documentation service of the INPOL system, so that