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Science in Justice: The Past 25 Years

The Meaning of 25 Years to Modern Man

A period of 25 years has relevance only when compared with different human activities. To an individual human being it can represent a major segment of his life's experience, for his scale of measurement is three score years and ten. To men as thinking beings, *homo sapiens*, a quarter century's time is minute, for this scale of measurement is about 50,000 years. To the human race as represented by the original *homo erectus*, the first true man, the silver jubilee of the American Academy of Forensic Sciences is infinitesimal, for the scale of measurement is probably 1.5 million years.

But it is not the physical man which the Academy symbolizes. It is intellectual man. And by the scale of measurement of man's intellectual advancement, the last 25 years is a profoundly significant period, even when placed on the measuring scale of 50 millenia. Quantitatively speaking, the body of man's knowledge has more than doubled in these two and a half decades. This human experience is unprecedented. In terms of quality the impact has been considerably greater. Atomic fusion; space exploration; the genetic code; instantaneous worldwide communications; the dismantling of colonial empires; the equalization of human beings through the continuing demise of historic, unnatural discriminations based on race, ethnic origin, economic class, social strata, or sex; and the complete subjection of planet Earth to human control are but a few of the unique, dynamic, intellectual developments in the human history since 1948 when the Academy was formed.

Direct Evidence of the Academy's Contributions to Justice: The Medicolegal Literature

The American Academy of Forensic Sciences was chartered for and is dedicated to the principle that intellectual man through the utilization of forensic science knowledge can better the justice relationships between and among men, both criminally and civilly. The discovery, identification, classification, preservation, and application of the forensic sciences to the legal processes are the daily tasks of the Academy's membership, individually and collectively.

One important segment of such broad responsibilities is found in the law-medicine branch of the forensic sciences. Real evidence of progress in the production of medicolegal knowledge for justice administration can be found in the legal literature.

Prior to 1948, in 1946 specifically, only fourteen references appeared under the key title of "Medical Jurisprudence" in the authoritative reference work *Index to Legal Periodicals*. In Table 1 the graphic history of the rapid rise in the number of medical jurisprudence articles collected in the *Index* is revealed. Within the master title one finds several dozen

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TABLE 1—References to articles concerning "Medical Jurisprudence" in the Index to Legal Periodicals.

Subjects	Number of Articles											Totals
	1946-9	1949-52	1952-5	1955-8	1958-61	1961-4	1964-7	1967-70	1970-2			
Alcohol	5	1	1	1	1	1	1	1	1	0	0	12
Anaesthesia	0	0	0	0	3	0	1	0	0	0	0	4
Auto, Aircraft	0	0	0	1	3	0	0	1	0	0	0	5
Back, Spinal Column	0	0	0	20	23	8	0	3	0	0	0	54
Blood, Vessels	1	2	1	5	6	4	0	3	0	11	0	33
Burns, Fires, Freezings	0	1	1	3	3	0	0	0	0	0	0	8
Cancer	0	0	1	8	5	4	2	0	0	0	0	20
Crime	0	0	0	0	0	2	1	5	9	0	0	17
Dermatitis, Allergy, Skin	0	0	0	2	2	1	1	0	0	0	0	6
Diabetes	0	0	0	3	1	0	0	0	0	0	0	4
Disability, Evaluation Rehabilitation	0	0	0	20	10	6	1	1	1	0	0	38
Disease	0	0	0	6	5	1	0	0	0	0	0	12
Drugs	0	0	0	0	6	3	2	4	3	0	0	18
Education, Organizations	3	4	1	15	3	5	8	7	3	3	0	49
Electroencephalography	0	0	0	4	0	1	0	1	0	0	0	7
Epilepsy	0	0	0	3	3	1	0	0	0	0	0	7
Expert Testimony	2	1	2	0	1	3	2	2	6	6	0	23
Fractures	0	0	0	17	17	0	0	0	0	0	0	34
General, Philosophy	0	2	9	8	5	8	6	9	4	0	0	51
Head, Brain, Spinal Cord	1	0	0	11	7	7	1	1	0	0	0	28
Health Care, Health Practice Therapy	0	0	0	0	2	20	11	12	4	4	0	49
Heart	1	0	3	24	13	7	3	1	1	1	0	53
Identification	1	0	3	3	2	0	0	1	1	1	0	11
Medical Jurisprudence, Medicolegal	2	0	1	5	3	0	12	10	2	2	0	35
Multiple Sclerosis	1	0	0	1	0	1	0	0	0	0	0	3
Psychiatry	1	0	0	22	11	9	8	3	1	1	0	55
Scientific Proof	10	2	4	19	18	15	2	6	0	0	0	76
Sex	0	0	0	0	4	0	0	0	0	0	0	4
Surgery	1	0	0	0	3	1	0	0	0	0	0	5
Therapy	1	0	2	4	12	3	2	12	4	4	0	40
Toxicology	1	0	3	0	2	2	0	0	0	0	0	8
Transplants, Experiments, Research	0	0	0	1	0	2	2	49	14	0	0	68
Trauma, Injury Aggravations	0	0	7	59	29	6	3	2	2	2	0	108
X Ray, Nuclear Radiation	1	2	2	9	4	1	0	3	0	0	0	22
Totals	32	15	42	274	207	122	69	141	65	0	0	967

especially important subjects which have excited academic scholars to investigate, contemplate, and then to write thereon. One cannot state directly that the Academy helped to cause this exponential increase in medicolegal literature in law, but one can safely infer this fact.

Evidence of the Academy's direct contributions are, however, supported by the real evidence of its own publication, the *Journal of Forensic Sciences*. This quarterly of 17 years' life is an accepted, worldwide authority for those individuals serving the forensic sciences in laboratory, classroom, or courtroom. Additional real evidence of the Academy's major contributions to the literature of the forensic sciences, including medicolegal matters, is the annual publication *What's New in Forensic Sciences*. This bibliography of pertinent literature from most relevant sources of science and jurisprudence publications is now a decade old.

Such literary evidence of the forensic science publications proves beyond a reasonable doubt that the birth and continuous growth of the American Academy of Forensic Sciences has been a major factor in the publication of legal literature devoted to the expansion of knowledge in the forensic sciences. The Academy has been literally churning the intellectual waters with its scholarly achievements.

Indirect Evidence of the Academy's Contributions to Justice: New Legal Concepts for the American Society

With the emergence of the forensic sciences as a powerful tool for the improvement of justice, it is no surprise that in the past 25 years the procedural and substantive laws of our nation have been altered dramatically for the better. Five profound legal changes are recorded here to illustrate the significant depth of these changes.

Unraveling the Human Psyche

In 1954 the legal environment had been so changed by forensic science developments that the prestigious U.S. Court of Appeals for the District of Columbia could decree in *United States v. Durham* [1] that an accused was not responsible for his criminal act if the act were the product of his mental disease or defect. This decision, not wholly without precedent, rocketed through American criminal justice administration because it exposed the courtroom to new medicolegal evidence from the forensic science of psychiatry. The century-old legal test for criminal insanity adopted in 1843 by the House of Lords in *M'Naghten's Case* [2] was not rejected. It was opened up. It was released from the intellectual bondage which had measured the mental responsibility of an accused only by his cognitive capacity. Under the word and the spirit of the *Durham* decision, judges and juries could now consider that other undivided moiety of man's mind—his psyche.

The law of criminal insanity remains even today in a state of great flux. However, because of this one case—the “open sesame” decision—the distillation of new, more accurate criminal responsibility rules are in the making. A healthy legal environment prepared by the new authenticity of progress in forensic psychiatry has cleared the pathway to the integration of the whole human mind, intellectual and emotional, into the law of criminal responsibility. The jurisprudence and psychiatry sections of the Academy have conducted many educational experiences in the past two decades to aid in the wise formulation of more humane and scientific understanding of the criminal “sanity or insanity” rule. The legal and psychiatric practices of the members of the Academy have further improved the criminal justice procedures by offering significant psychiatric evidence in many criminal cases to the end that the decision of “sane” or “insane” can approach closer to the ultimate truth.

Applying Technological Advances

The greatest revolution in human society during the past quarter century continues to be the technology revolution. Man has created machine-servants, both physical and mental. He has moved from the first generation of technology to the second generation. The first generation represents the expansion of man's physical prowess. It began when man first walked erect, picked up a tree limb, and used that limb to add power to his own muscles. The second generation of technology has just been born. It is the expansion of man's mental power. It is symbolized by such words as computers, automation, and cybernetics. Now man must discover how to keep his new mind machines as his servant and to prevent the mind machines from becoming his master.

The American justice system can display a prime example of one success in this endeavor. That success is directly attributable to members of the American Academy of Forensic Sciences, particularly those in the toxicology section. It involves the question of the blood alcohol level in a drinking automobile driver.

Once again the historical, substantiating evidence begins in a court decision. The United States Supreme Court in 1966 rendered its decision in *Schmerber v. California* [3]. The Court majority held that there was no violation of a person's constitutional rights in requiring an accused to be subjected to a blood test against his will, and against the advice of his counsel who was present. The blood sample was forcibly taken by a physician in a hospital. The scientific result of the test was then placed into evidence. The accused was convicted of traffic manslaughter based upon the charge of driving while intoxicated. This court decision has become the foundation stone for an ever-increasing number of state implied consent statutes, which require compulsory alcohol testing of automobile drivers suspected of being intoxicated. Happily, technology has provided us a mind machine to measure the blood alcohol level by breath sampling. Within the Academy are the pioneers who have brought the scientific knowledge concerning the blood alcohol impact on the human mind into the development of a technological instrument to make this mental determination by breath sampling. This serves criminal and civil justice and makes our communities safer and healthier places to live. Our system of justice now can utilize a most simple and accurate machine to enforce law and, simultaneously, to secure the accused human subject freedom from the physical assault demanded by compelling blood extraction in order to measure the blood alcohol level. Better highway safety, more accurate factual evidence for criminal prosecution, and a safe procedure to protect the physical integrity of the individual subject have been major benefits of this phenomenal example of technology serving man through advances in the forensic sciences.

Recasting Police Procedures

The decade of the 1960's unfolded the most dramatic reorganization of law enforcement procedures in America's history. The United States Supreme Court, using both constitutional authority over state governments and its administrative power over Federal criminal procedures, redefined and unified both Federal and state police processes for criminal justice administration. *Mapp v. Ohio* [4] in 1961 forbade the introduction at the criminal trial of evidence seized in violation of the 4th Amendment protection against unreasonable search and seizure. *Escobedo v. Illinois* [5] and *Gideon v. Wainwright* [6] secured the right to be represented by counsel and the right to have counsel appointed when indigent. *Miranda v. Arizona* [7] required the police officer to inform the criminal suspect of all of his constitutional rights when the officer moved from the investigatory stage to the accusatory stage in the criminal detection and investigation procedure.

Two powerful forces motivated the judiciary. First, the police as the arm of a constitutional government were made responsible to alert the citizen of his legal rights when confronted with the criminal process of his government. Thus, the police were simultaneously to inform citizens of their constitutional rights and to exercise for society its governmental authority to keep the peace and to maintain public safety. Second, the growth of forensic sciences as a legitimate source of evidence in criminal cases began to reduce the traditional need for the confession or admission by an accused to prove his guilt in criminal trials. Real evidence skillfully gathered by police, scientifically evaluated in police laboratories, and wisely introduced by trial counsel as evidence through expert scientific witnesses has made the written and oral confession or admission less important, just as it was generally less reliable, than the evidence from a professional forensic scientist.

The increase in the use of forensic science evidence since 1960, therefore, has been the result of (1) the limiting of confession and admission evidence from the accused by new laws and (2) the increasing of the quality and quantity of the forensic sciences by better professional practices.

The judiciary in all this period has continuously held to be legitimate and constitutional the compulsive taking from the accused of the raw materials for forensic science evidence: fingerprints, clothing, written samplers, and even blood. Members of the Academy's sections of criminalistics, questioned documents, and toxicology, as well as odontology, pathology, and biology, by their daily work through the scientific process, have begun to replace the confession and admission of the accused with their scientific facts and opinions. A substantially better source of truthful facts and sound opinions for decision making in the criminal trial now exists. It may well be that the dramatic judicial decisions of the 1960's of *Mapp*, *Escobedo*, *Gideon*, and *Miranda* will lead in the 1970's to the use of scientific evidence in criminal cases as the basic and primary, possibly even exclusive, evidence against the accused in all criminal charges.

Imposing Higher Standards for Health Care

The American Academy of Forensic Sciences began in 1948 with heavy emphasis on the criminal process. As the years passed, increased concern for civil law problems has become a reality. Physicians have felt the impact of an expanding legal duty in the medical care of their patients. The imposition upon attending physicians, dentists, and other health practitioners of the doctrine of *res ipsa loquitur* began over 60 years ago in California. Within the past two decades, however, this doctrine has given way to almost a rule of strict liability upon the health professional. Both judicial decisions and jury verdicts have been the sources of this broadening law of professional liability. In addition, the concept of the standard of medical care being based upon the local community practice has dissolved. The broader community of the nation as a whole is now the measuring area to determine what is adequate medical care by the practicing professional for his patient. The medical evidence required for decision making in civil lawsuits involving these new rules has become an important element in civil justice administration. Heated controversy between lawyer and physician has been the order of the day [8]. Forensic sciences, especially through pathology, biology, odontology, toxicology, and psychiatry, have a golden opportunity in the 1970's to aid in the resolution of this medical malpractice imbroglio. Above all, the health specialists and attorneys in the Academy should understand and appreciate each other's roles in the whole process of justice. The Academy, therefore, has a special obligation to mediate the present professional conflict now raging throughout America.

In addition, new civil liability for hospitals and similar institutional facilities in the medical care delivery system has also emerged in the last two decades. The landmark case of *Darling v. Charleston Community Memorial Hospital* [9] in 1965 placed direct responsibility on the hospital to maintain for its patients an acceptable standard of care. Pathologists, dentists, toxicologists, psychiatrists, surgeons, and all other health care practitioners are now woven into the web of legal liability, either as independent contractors or hospital employees. Additionally, the hospital as a legal entity itself also assumes primary obligation to the patient.

Even the government hospital, which traditionally has had the legal protection of sovereign immunity from the citizen-patient lawsuit, is now liable to the patient. Sovereign immunity is now ending for the multitude of municipally owned and operated hospitals through the efforts of judicial decisions [10].

Legal issues concerning acts of negligence, proximate cause, disability, and damage demand increasingly greater sophistication on the part of attorneys from the jurisprudence section, as well as those expert medical witnesses from the pathology and biology, toxicology, psychiatry, odontology, and general sections. Malpractice litigation involves professional judgments from both medicine and law. While Academy fellows provide the resolution of a specific malpractice lawsuit through participation in a traditional tort case, the greater challenge now emerges to undergird quality health care by legal processes other than the age-old lawsuit. Forensic science statemanship to meet this new challenge is imperative. The Academy must provide more than expert medical witnesses for malpractice litigation. It must offer forensic science statemanship to inaugurate more equitable rules for imposing higher standards of health care.

Establishing Quality Health Delivery

With the advent of the 1970's an entirely new thrust in forensic sciences has appeared. Instead of the traditional use of these sciences to unsnarl legal conflicts arising from criminal acts or civil injuries, the contemporary demand is to create a quality health system for the whole American society. Admittedly this activity includes primarily civil matters and only secondarily criminal activities. As forensic sciences continue to become more concerned with the quality life for each individual and good living for all citizens, the forensic sciences role will shift away from criminal case emphasis to civil problem concern. In order to ensure an environment of health and safety for all, the pollution problem is the next case on our docket.

In 1969 the *National Environmental Policy Act* [11] and in 1970 the *Occupational Safety and Health Act* [12] represented congressional inauguration of this new era dedicated to quality living. Forensic scientists, especially those professionals in the toxicology and pathology and biology sections, will now become expert scientific witnesses not only in the traditional criminal trial but, more importantly, in the hearings of regulatory agencies seeking to remove the many pollutants as well as the health and safety hazards from modern American life. From 1973 forward, to create a healthy and safe environment will be the new challenge of the forensic sciences. The task confronted is not to forsake the historic criminal procedure role of forensic sciences. This role must be retained and strengthened. The real job, however, is to add to this old role of forensic sciences a new role which seeks to build an America free from the curses of technological pollution and blessed with a healthier and safer national environment.

Proposed congressional legislation for 1973 adds another new dimension to the forensic sciences. The Javits bill [13] and the Humphrey bill [14] in the U.S. Senate both deal with the emerging problem of setting legal standards and lawful procedures in the areas of

research and experimentation involving human subjects. Professional practitioners in the jurisprudence, psychiatry, pathology and biology, odontology, and toxicology sections already should be concerned with these delicate problems. In medical centers, university laboratories, hospital facilities, and research institutes, these problems are currently present. When Federal grants are involved, in whole or in part, regulations of the U.S. Department of Health, Education and Welfare are applicable [15]. The full picture, legally and scientifically, is not yet in focus. What is visible, however, does give utmost concern: a hospital injecting live cancer cells for experimental purposes into aged patients, a university exposing certain restricted human beings (such as patients) to massive radiation exposure under a Pentagon contract, a Federal government health agency introducing syphilis spirochetes into impoverished, unwitting blacks. To draft adequate rules to protect human beings used as subjects in research and experimentation is a master task for the forensic sciences. The answer to the solution of this problem rests with scientific and jurisprudential professionals who know and respect the practices of each other's professions. The fellows of this Academy are unique in this quality. Their goal must be to strike a balance between a medical science which requires research involving human subjects to advance the health and welfare of man, and a legal process which secures to individual citizens their personal freedom and integrity to know what is to be done to them, and to decide intellectually and emotionally if it should be done.

Conclusion

At the bedrock level, the American Academy of Forensic Sciences has been involved in many advances over the past 25 years, not just as an organized entity but even more dramatically through the labors of its individual members. The Academy as such has been a viable forum for the public discussion of the forensic sciences in modern American society. As such it has disseminated by publications the research and intellectual accomplishments of individual forensic scientists. In both endeavors, it has become a lively marketplace for the exchange of ideas on forensic science matters concerning human justice.

In the next quarter-century the efforts of the Academy will involve, from the standpoint of law and justice, new challenges and new experiences. The educational forums and the case practices of the forensic scientists will be superseded by the planning processes to create the new America for the year 2000 A.D., where science and justice are in a proper balance for life and living in a state of health and justice befitting the children of God.

While judicial decisions and legislative enactments have been prominent in the past, the future will entail progressively more citizen involvement in the planning and performance of forensic sciences matters. As a valuable product of this new citizen involvement for the better life in America, the separate forensic science practices in criminalistics, pathology and biology, toxicology, questioned documents, psychiatry, jurisprudence, physical anthropology, odontology, and others will become subordinated to an interdependent and integrated participation in delivery of both good health and equal justice. We shall become less practitioners and more participators and, hopefully, scientifically creative and legally just.

The forensic scientist of the future will be measured not by his personal contribution as an expert witness in a legal conflict, civil or criminal. He will be graded by his personal contribution to this growing integrative force which seeks to deliver true health and real justice to the whole American community.

The professional pathway into the future leads from the independent practice of an individual forensic scientist to an integrated delivery by many participating planners and performers in science and law.

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