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THE HISTORY AND DEVELOPMENT OF FORENSIC MEDICINE*

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Forensic medicine may be defined briefly as consisting essentially of that body of medical and paramedical scientific knowledge which may be used for the purposes of administration of the Law. In discussing its history it is obviously impossible to indicate any single date as the point at which forensic medicine emerged as a recognizable, separate scientific discipline. It is justifiable, no doubt, to contend that Medicine originated in the very dawn of human history, when first a cry of pain prompted a fellow-being to experiment with simple forms of assuagement. Similarly, the Law may be said to have its origins in the earliest sanctions which were doubtless applied to disturbers of the peace in the most primitive communities. We cannot begin to think of forensic medicine as an entity, however, until a stage of civilization is reached in which we have, on the one hand, a recognizable legal system, and on the other an integrated body of medical knowledge and opinion. Furthermore, we cannot know much about such matters until some means of recording them has been achieved, and our earliest records take us back only about five thousand years.

Egyptian Law and Medicine

We must turn, therefore, to the records of the early literate civilizations of the Near East, particularly to those of the Nile Valley, where, from the ancient Egyptian inscriptions on stone and later on papyri, we can obtain some idea of the state of knowledge at that early period. I believe there is some evidence that Menes, the first Pharaoh, had a considerable knowledge of medicinal plants, and it is quite certain that at a somewhat later period there was a knowledge of medicine which was not only extensive but also clearly systematized and showed a much more scientific approach to medical problems than is generally realized. This much can be gleaned from the now fairly numerous medical papyri which have been translated. These include the Ebers (medical), Edwin Smith (surgical), and Hearst Papyri, and a few others which are rather more fragmentary, such as the medical papyri in the British Museum. From these, from illustrative inscriptions, and from actual mummified remains, it is possible to draw many valid conclusions regarding Egyptian law and medicine from as early as 2500 B.C. onwards. There was a definite system of law, relating not only to crime but also to property, marriage, and other civil matters. The punishments

for crime were rough and ready, consisting often of strokes with a cane or a lash, sometimes of more elaborate forms of torture or of mutilation, such as cutting off the ears, nose, hands, or feet. Not uncommonly, the convicted person was thrown to the crocodiles of the Nile, but the most frequent punishment of all, at least during certain eras, was to put the culprit to forced labour for long periods—hence the Pyramids.

So far as medicine is concerned, along with much that lies in the domain of magic and sorcery there is a surprising amount of sound medical and surgical knowledge. Of more consequence, so far as we are concerned here, is the evidence that the practice of medicine was subject to legal restrictions. The right to practise was restricted to members of a certain class, and intending physicians had to study the precepts laid down by their predecessors in certain ancient books. There were specialists in all branches of medicine and surgery, and physicians were specially interested in conditions affecting the head, the teeth, the eyes, the intestines, etc. A number of doctors specialized in diseases of women and children, and there is a note of a title "Keeper of the Anus"—surely a very narrow specialty. Salaries were paid by the Egyptian Treasury; in fact, we see there the first State medical service. There is indicated in the Edwin Smith Papyrus a considerable knowledge of practical anatomy such as was unknown for many centuries to the physicians of other races and nations because of religious and other prejudices against the dissection of the dead body.

Knowledge of drugs, including poisons such as arsenic, mercury, and copper among the metals, and hyoscyne, coniine, and other vegetable poisons, was considerable. It may be recalled that Homer speaks of the wealth of such knowledge which had been derived by the Greeks from the Egyptians. Homer was writing his two best-sellers about three thousand years ago, so that we may be sure that the Egyptians' knowledge was of much more ancient date.

The First Medico-legal Expert

This was the state of affairs by the time that the papyri were written, but there is little doubt that the regulations developed gradually over a long period, and were possibly derived from the precepts of Imhotep and his followers, about 3000 B.C. Imhotep was the Grand Vizier, Chief Justice, and Physician to King Zozer, and as a side-line he was also architect of the

*Being an address given to the Osler Club on December 1, 1950.

first great Pyramid at Sakkara. He was the first great man combining the sciences of law and medicine; he might, if you wish, be described as the first medico-legal expert. Unfortunately Imhotep became a god, and it is one of the weaknesses of Egyptian medicine that the methods of treatment became largely empirical and irrational through the influence of tradition, heavily overlaid with an aura of divinity and magic. Much of the witchcraft, magic, and sorcery is understandable, for it was not unreasonable to assume that ills of obscure origin might well be due to malignant demons inhabiting the body. Hence the devising of powerful charms, amulets, incantations, and so on—in some respects not unlike the bottle of medicine given so freely to-day. One result of this outlook, however, was that experiment and originality were not encouraged, and thus the distinction between good treatment and bad, between competence and malpraxis, became largely a question of whether or not the authoritative "canon" had been observed. If unsatisfactory results followed a course of treatment which departed from the orthodox, the consequent penalties might well be a serious matter for the physician. Indeed, he might be called upon to pay for his unorthodoxy with his life. There is little to indicate any particular medico-legal practice, but Pliny tells us that the bodies of those who died were examined to ascertain the cause of death, and we know that a fairly extensive knowledge of toxicology was required.

Medical Laws in Early Civilizations

From the records of other more or less contemporary civilizations we can glean information that is no less interesting. In Babylonia an equally rigid control was exercised over admission to the medical "profession," and a similarly authoritative code of practice had to be followed. The earliest record of a murder trial has recently been found in Central Babylonia, in Sumeria, on a clay tablet dating back to about 1850 B.C. Regarding the ancient Israelites, we know little or nothing about their medical men, if they existed as such. The well-known biblical quotation, "Honour a physician with the honour due to him . . . for the Lord hath created him," would suggest that they were not without influence; and there is another quotation, rather ambiguous in its terms—namely, "He that sinneth before his Maker, let him fall into the hand of the physician." It is of some significance to note that the ancient Jewish laws drew a distinction between mortal wounds and those which were not to be so regarded, and also prescribed the investigation to be made in cases of disputed virginity. It is hard to avoid the conclusion that the opinion of "physicians" had a place in the determination of such matters.

Much farther East, in India, at a correspondingly early date, the right to practise medicine was also restricted to the members of certain castes and a prescribed method of medical education was enforced. By law the minimum age for marriage for girls was laid down as 12 years; the duration of pregnancy was recognized as being between 9 and 12 lunar months, with an average of 10 months; and in these matters, and perhaps also in others, medical opinion was applied to the requirements of the law. Another feature of Hindu medicine of this period was that considerable importance was attached in medical education to a knowledge of poisons and antidotes, and to the means whereby various poisons could be differentiated.

Thus, although the knowledge which we have of these early times is fragmentary, and although it is insufficient to justify a claim that there was anywhere an established science of forensic medicine, we can say that wherever man succeeded in creating a "civilization" problems arose, and these were dealt with by means which we can recognize as forming at least the elementary bases of these subjects—medical education, admission to the medical profession, medical ethics, public health, forensic medicine proper, and toxicology—which ultimately fall within the province of what has been generally known as State medicine.

The Greek Legal Code

In all the civilizations to which reference has so far been made, a common feature was that the practice of medicine was associated with magic and priestcraft and divine traditions. To the Greek civilization we owe a great deal for placing medicine on a rational basis, largely due to the scientific outlook and methods of Hippocrates. Not only was there a great emancipation and development in medicine in ancient Greece, but there was also a remarkable development in the field of jurisprudence. The Greek Legal Code, especially as regards criminal procedure, was very full and elaborate. Though there is no clear evidence that medical knowledge was officially made use of in establishing proof in courts of law, Hippocrates and others discussed many medico-legal questions, such as the relative fatality of wounds in different parts of the body, the possibility of super-foetation, the average duration of pregnancy, the viability of children born before full term, malingering, and other matters which almost inevitably must have repeatedly been at issue in the courts. In view of the high standing enjoyed by the physicians of ancient Greece, it is hard to believe that their opinions were disregarded by a legal system which was equally anxious to maintain its place of high esteem. It is interesting to note that the ancient Hippocratic Oath included an undertaking not to administer poison or to advise on the use of poisons, nor to contribute to the procuring of abortion. Indeed, it is no exaggeration to say that the whole ethical outlook of the medical profession throughout the ages has been determined largely by the ethical teachings of Hippocrates more than two thousand years ago.

Roman Medical Legislation

Roman legislation was not notably more advanced than the Greek, upon which it was so largely based, but during the lifetime of the Roman Empire there was considerable progress in medicine. Galen, Celsus, and others, both Greek and Roman, continued the objective rational methods of the Greek physicians, and, if there is no reason to believe that the law made greater systematic use of the medical knowledge available, at all events the stage was coming nearer when objective factual medical findings could be of a standard admissible even under the strictest codes of evidence and procedure. Certain notable cases of medical evidence have frequently been quoted. For example, the body of Julius Caesar, assassinated in 44 B.C., was examined by a physician, who pronounced the opinion that of all the 23 wounds sustained, only one, penetrating the chest, was of a fatal nature.

Another much-quoted case was that of Germanicus, who died in the year A.D. 19, and whose death was

attributed by one side to poisoning and by the other side to heart disease, both on the grounds that *the heart did not burn*. Such an instance gives us an inkling, perhaps, of the reason why the courts did not make as much use of medical evidence as might have been expected. Other cases refer as always to the vexed problem of abnormal periods of gestation and their relation to legitimacy. Under the rule of Hadrian (A.D. 117-138), for example, several instances were recorded of births after unduly prolonged pregnancies being held legitimate in view of the opinions of ancient philosophers and physicians, who considered that no fixed maximum period of gestation could be stated with certainty. Across the intervening centuries we can still agree with the ancients on this particular point at least. It should be noted also that in the later Roman era the conception of urban public health measures strikes a note that is closely in harmony with a modern outlook—at least up to the point where public health was still public health and not social medicine.

So we come to the era of the decline and ultimate dissolution of the Roman Empire and its Byzantine postscript. Almost as if they were intended to be a lasting memorial to the fast-fading greatness of Rome, the Justinian enactments made their appearance between A.D. 529 and 564. Amongst many other things, the Justinian Code provided for the regulation of the practice of medicine, surgery, and midwifery; the proof of competence by means of examinations; the classes of physicians that were to be recognized; the limitation of the number of physicians in each town; and the penalties to be imposed for malpraxis. All this has an amazingly modern ring about it. The Justinian laws clearly recognized and defined an integrated medical profession, with required educational standards and standards of competency, in a way that had never previously been equalled. Moreover, the status and function of the medical expert in connexion with legal procedures are indicated more clearly than ever before—“*Medici non sunt proprie testes, sed majus est judicium quam testimonium*”—which may be freely translated to mean that the medical expert is not used to proper or greatest advantage if he is regarded simply as an ordinary witness, appearing for one side or for the other side; his function is rather to assist the judiciary by impartial interpretation and opinion, based on his specialized knowledge. This dictum holds true to-day and should never be forgotten.

It was in this sense that the Justinian Code enjoined the co-operation of medical experts in a considerable variety of legal problems—e.g., in the determination of the existence of pregnancy, in cases involving sterility or impotence or legitimacy, in cases of rape, in cases of poisoning, in cases involving the problem of survivorship, in cases which were complicated by the question of mental disease, and in other comparable circumstances. The Justinian enactments may be held to represent the highest point of achievement in the way of defined forensic medicine in the ancient world; elements of the Justinian Code were carried forward, and appear in many modern legal systems; and, indeed, nothing of comparable status is to be found until after the conclusion of the Dark and Middle Ages.

For the thousand years which followed the fall of the Roman Empire there was no real development in forensic medicine. Indeed, there was a general stagnation in the entire field of medicine and scientific thought generally. The methods based on observation

and experiment fell largely into disuse, and practice was mainly determined by tradition. The influence of Galen and the spread of Christianity have been held to have retarded scientific progress, and there is no doubt that dogma and subservience to authority do have this tendency, though such has little to do with the simple faith of the people. In the field of law there was a corresponding deterioration which led to the absurd expedients of trial by ordeal and the widespread use of torture to extort confessions whereby decisions might be reached, apparently to the satisfaction of all, or nearly all, concerned. Probably there were areas of relative enlightenment, but, if so, their influence remained localized. The lights of progressive learning burned low throughout Europe, and there was no central authority comparable to Rome in its heyday which could set an example for others to follow in progressive legislation or medical progress. In such circumstances, therefore, it is not surprising that throughout this long era we search Europe in vain for any evidence of real progress in forensic medicine.

A Noteworthy Chinese Document

Perhaps things were rather better elsewhere. In China, for instance, there was compiled in the first half of the thirteenth century a noteworthy volume on the procedure to be followed in investigating deaths, especially those in suspicious or obviously criminal circumstances. This was entitled the *Hsi Yüan Lu*, literally the “washing away of wrongs,” and has been aptly paraphrased as “Instructions to Coroners.”* It was itself based on instructions given in books of still earlier date, and, with modifications introduced with the passage of time, it continued to be the authoritative code until fairly recent times.

I have not seen a translation of a really ancient copy of this book, but even from a comparatively modern edition (1843) one certainly gets the impression that there was a comprehensiveness in the scope of medico-legal procedure in ancient China that was not to be found in mediaeval Europe. The importance of a satisfactory examination of the wounds on a body is stressed, among other reasons, in order to check the validity of a confession or other statement. The sites where wounding is likely to prove mortal are indicated. The preparations necessary for the examination of a body are described, and the examiner is warned not to be deterred by the unpleasant state of the corpse, but to make a systematic examination from the head downwards in every case. The difficulties caused by decomposition are clearly recognized, and the examiner is advised on the subject of counterfeited wounds. Sections are devoted to wounds caused by different agencies, such as blows from the fist or kicking, by various types of weapon, etc., and to asphyxial deaths—e.g., by strangulation and drowning. The possibility of homicidal strangulation being passed off as suicide is discussed, also the means for distinguishing between the bodies of drowned persons and those thrown in after death. The possible confusion between ante-mortem and post-mortem burning is recognized, and poisoning is given considerable attention. The examiner is advised on the possible importance of examining the locus, and is warned that at an inquest nothing should be regarded as unimportant. In this connexion

*See article by Professor H. A. Giles: *Proc. R. Soc. Med.*, 1923-4, 17, Sect. Hist. Med., 59.

an adage is quoted which might almost serve as a motto for our modern forensic scientists:

"The difference of a hair will be
The difference of a thousand li."

Altogether it is a remarkable document, and, although some of the methods and tests described are fantastic, there is no doubt that the real nature of the problems involved was clearly appreciated. As I have suggested, it is unfortunate that I cannot with certainty sort out the genuinely ancient from the more modern interpolations, but I am left with the conviction that in mediaeval times Chinese forensic medicine was far in advance of contemporary European practice. It would be of great interest if some student of Chinese history could unearth and translate an undoubted mediaeval text of *Hsi Yüan Lu*.

Early Germanic Codes

Reverting to the European scene, we can but remark that the possibilities inherent in the Justinian enactments, though never entirely lost, were so dissipated, distorted, ignored, or supplanted that no significant applications or developments fall to be recorded until we enter the sixteenth century. In 1507, under the auspices of the Bishop of Bamberg, a comprehensive and systematized penal code was published, which was soon adopted by a number of the neighbouring German States as well. Chief credit for the actual work involved appears to belong to John, Baron of Schwartzenberg, and, since we must really look on the Coda Bambergensis as the starting point for the science of forensic medicine as we understand it, it is but proper that the names of the two individuals mainly responsible should be recorded.

Within a very short space of time, in 1553, clearly based on and developed from the Bamberger Code, there appeared the still more important *Constitutio Criminalis Carolina*, or Caroline Code, published and proclaimed by the Emperor Charles V as the code of law which was henceforth to be observed throughout his extensive empire. In both these early Germanic codes it is for the first time clearly and definitely laid down that expert medical testimony *must* be obtained for the guidance of the judges in cases of murder, wounding, poisoning, hanging, drowning, infanticide, abortion, and in other circumstances involving the person.

The importance of the Caroline Code was soon reflected in legislative changes elsewhere, notably in France, and indeed throughout Europe there was a gradual stirring and awakening from the intellectual slumber in which she had lain for so long. It would be too much to say that belief in witchcraft waned so early or so suddenly, but there was a growing scepticism of the value of trial by ordeal and other mediaeval travesties. Physicians of the time played their part in the development of a saner, healthier outlook on such matters, for medicine, too, was struggling out of its state of relative stagnation.

Paré, Fideli, and Zacchia

In such favourable circumstances, therefore, it is not surprising that we find medical men of the period taking a new and lively interest in the application of their knowledge to the solution of legal problems. Published works on the subject began to appear in the second half of the sixteenth century, and pride of place should probably be given to Ambroise Paré, who in

1575 devoted one of his volumes to a discussion of monstrous births, simulated diseases, and the methods to be adopted in preparing medico-legal reports. The first medico-legal *magnum opus*, however, was by an Italian physician, Fortunato Fideli, and this also appeared before the end of the century, in 1602. It was entitled *De Relationibus Medicorum*, and ran to four books of considerable size. Although in many ways it reflected the authoritative doctrines and superstitions, ecclesiastical and otherwise, which prevailed at the time, the comparative modernity of its scope is remarkable, and one is struck by the consistent similarity of the problems which confront the law, no matter which century, or which country, or which legislative system is concerned.

Soon, however, the books of Fideli were overshadowed by a still more impressive work. This was by another Italian, Paul Zacchia, physician to the Pope, and one of the most eminent medical men in Europe at that time. Between the years 1621 and 1635 he published his monumental *Quaestiones Medico-Legales* in three large volumes. Of these, the first is of greatest interest, as it contains Zacchia's exposition of the existing state of knowledge and belief over the entire field of forensic medicine. In the second volume, a great variety of hypothetical questions are raised and discussed, while the third volume contains the authoritative decisions of the Roman Rota on problems of all sorts. An outline of the contents of the first volume is as follows: Book I: Age; Legitimacy; Pregnancy; Superfoetation and Moles; Death during Delivery; Resemblance of Children to their Parents. II: Dementia; Poisoning. III: Impotence; Feigned Diseases; the Plague and Contagion. IV: Miracles; Virginity; Rape. V: Fasting; Wounds; Mutilation; Salubrity of the Air.

The work has many shortcomings in common with that of Fideli, which could hardly be otherwise. Knowledge of anatomy and physiology was sketchy and erroneous; the inclusion of a section of miracles is in itself sufficiently revealing; and it is depressing to reflect that an acquaintance with the different methods of torture was of more than mere academic concern to the physicians of that period. But, taken all in all, it is a remarkable work, scholarly and well informed for its period, and it well deserved the high reputation and authority which it immediately attained and for long kept. This high reputation was not confined to the author's native country, but spread throughout Europe. But although these two Italian physicians, Fideli and Zacchia, thus early achieved such promise and distinction in the field, it must be remarked that the Italian pre-eminence was not maintained, and it is not until comparatively recent times that there has been any further contribution of note from their countrymen.

In France, the pioneer volume by Ambroise Paré was followed after a respectful interval by the more comprehensive works of Gendri (1650), de Blegny (1684), and Devereux of Paris (1693). Both there and elsewhere, active interest and careful observation were progressively adding to the value of medical evidence, and experimental methods were increasingly adopted. Under the influence of Vesalius, Fallopius, Eustachius, and others, the knowledge of anatomy increased greatly. Harvey (1628) proved the circulation of the blood, and there were other notable advances in physiology. It may be noted that both Galen and Harvey had remarked on the difference between the

lungs of a foetus and those of an infant who had breathed, and the test is referred to in the Bamberger Code. It was a Danish physician, however, Thomas Bartholin, also well known in other connexions, who in 1663 drew fresh attention to the hydrostatic test for determining whether lung tissue had respired or not. The first recorded practical application of the test appears to have been made in 1682.

Increase of Interest in Germany and France

Although it was in the Germanic States that modern forensic medicine may be said to have had its birth, the German physicians were not, surprisingly enough, so precipitate in their published works. They were not idle in a practical sense, however, and the application of forensic medicine proceeded faster in Germany than anywhere else. It was in Germany, too, that the first systematic instruction in the subject was given—by Michaelis, starting about 1650, and thereafter by Bohn, both in Leipzig. In 1689 Bohn published the first important work on the subject in Germany, on wounds, to be followed in 1704 by his more comprehensive treatise, *De Officio Medici Duplici, Clinici Nimirum ac Forensis*. Thereafter the number of German writers on the subject increased very rapidly, testifying to the growing importance attached to the subject. The *Corpus Juris Medico-Legale* by Valentini in 1722 was the first work seriously to rival the supremacy of Zacchia, and other impressive contributions were made to the literature by Boerner, Zittmann, Teichmeyer, Alberti, and others. Published cases or collections of cases became increasingly numerous, and helped greatly to define the problems most commonly encountered and the methods by which they might best be solved. A number of professorial chairs in State or forensic medicine were founded in the universities, and German supremacy in the subject was firmly established and rendered still more absolute by the labours and authorship of Plenck (1781), Metzger (1793), and others towards the close of the century.

No other country had displayed such consistent interest and activity. As has been suggested already, Italy lapsed into a non-progressive state from complete reliance upon the writings of Zacchia. Elsewhere interest was fitful and spasmodic. Even in France little or no progress was made until after the turn of the eighteenth century, when a notable increase in interest occurred. Initial credit for this must go to Louis, whose published works soon came to command high respect. His *Mémoires*, appearing in 1788, dealt with the signs of death, drowning, suicidal and homicidal hanging, and other topics. He is also to be remembered as the first systematic teacher of medical jurisprudence in France. Louis was followed by others such as Salin, whose investigation into a case of corrosive sublimate poisoning forms a landmark in the history of toxicology; Lafosse, who not only described the positive signs of pregnancy and parturition but also investigated various post-mortem phenomena and indicated how they might be distinguished from the effects of ante-mortem injury; and Chaussier, who in 1789 delivered a notable memoir which admirably emphasized and illustrated the importance of forensic medicine and who inaugurated a full course of lectures in the subject to a large class of pupils. Three French professorial chairs in legal medicine were established—at Paris, Strasbourg, and Montpellier. The occupant of the Paris chair, Professor Mahon, attained considerable fame, and,

perhaps most notable of all, the name of Fodéré makes its appearance, before the close of the century, with the publication in 1796 of his *Traité de Médecine Légale et Hygiène Publique*. It might therefore be said that, while Germany still held the lead, France was advancing rapidly, while Britain had barely entered the field. She was, however, soon to do so, and the point seems opportune for a brief general survey of the worlds of law and medicine in which the new competitor was to take its place.

By and large, it can be said that the legal systems operating in most of the European countries were essentially the same as those which apply to-day. There have been many important and highly significant modifications. In Britain, for example, the number of capital offences has been reduced virtually to one from something like 150; the facilities for the defence of accused persons have progressively improved; the onus of proof rests much more heavily on the Crown, and the standards of proof required are much higher to-day than in 1800. I do not seek to minimize the fundamental importance of these and other changes or to suggest that we should do otherwise than maintain a critical, progressive outlook on our legal processes, but that does not affect the contention that the legal frameworks within which medico-legal science was called upon to function were essentially those of our modern societies.

Development of Scientific Medicine

The changes in the world of medicine during the past 150 years have been much more revolutionary in character, as I need hardly stress. Scientific medicine, in a modern sense, developing during the nineteenth century and progressing so tremendously during the past 50 years, can hardly be said to have had an existence before 1800. Nevertheless the profession had come a long way. The days of Galen's supremacy were far behind. The revolutionary discoveries of Harvey and his contemporaries had long since become part of the body of accepted medical knowledge. The work of Sydenham had profoundly affected the clinical attitude of the profession. Sir Thomas Browne had written his *Religio Medici*. Anatomy and physiology were reasonably well developed sciences. The scientific discoveries of Boyle, Hooke, Newton, Linnaeus, Black, Priestley, and Lavoisier had been made known to the world. The microscope had been in use for a hundred years, and many kinds of medical apparatus had been devised that were essentially modern in their concept and application. The great medical schools, of Leyden and Edinburgh in particular, had done, and were doing, much to advance medical knowledge and practice, and many of our Royal Societies had come into being. It is only necessary to mention the famous British names of the eighteenth century—the Monros, primus and secundus, Sibbald, Benjamin Bell, Cullen, Gregory, Smellie, John and William Hunter, Heberden, Dover, Astley Cooper, Jenner, and many others—to appreciate the great developments which had taken place in medicine since the time of the European Renaissance, between, say, 1550 and 1800, between the dates of the Bamberger and Napoleonic Codes, between the published works of Fideli and Fodéré respectively. Indeed, I might well conclude my brief survey with a quotation from the latter, who in the introduction to his treatise on legal medicine characterizes the eighteenth century as "an era remarkable for the conversion of the human mind from the enthusiasm of

poetry and the fine arts to the cultivation and study of the exact sciences." There were being sown the seeds which yielded such a large harvest in the following century and in our own day and generation. This, then, was the state of affairs, and this the prevailing atmosphere, in which forensic medicine was introduced into Britain as a distinct entity.

Some Famous Medico-legal Cases

It is true, of course, that there are many earlier instances of medical testimony being given in courts of law. In the records of the sixteenth and seventeenth centuries there are numerous cases in which surgeons gave evidence in cases of wounding. A few of these early instances have remained among our best-known medico-legal cases. In 1678, for example, the body of Sir Edmundbury Godfrey was found impaled on his sword to simulate suicide, but with his neck broken. At the trial which ensued two surgeons gave evidence on the time of death, and testified that the sword thrust was inflicted after death, and that the injury to the neck was due to homicidal violence. Titus Oates, the notorious perjurer, gave evidence for the first time at this trial, at which three men were found guilty of murder and subsequently hanged.

The trial of Spencer Cowper in 1699 gives us a very good idea of the state of such matters at the end of the seventeenth century. Spencer Cowper was a solicitor who was charged with the murder of a girl, Sarah Stout, whose body was found floating in a mill dam. The fact that the body was found floating was considered proof that it was dead when thrown into the water. This contention was supported by the testimony of two sailors from one of His Majesty's ships, who stated that the bodies of men who had been killed and then thrown into the water always floated, whereas the bodies of those who died from drowning always sank. Evidence was given by Dr. Cowper (the discoverer of Cowper's glands) and others to the effect that the cause of death had nothing to do with floating, but that bodies always sank whether they were alive or dead when placed in the water. Cowper also gave a good description of the phenomena of drowning and the reason for the presence of water in the lungs and stomach. While it cannot be contended that the medical evidence in this case was entirely satisfactory or free from contradictory features, it undoubtedly played an important part in securing the acquittal of the accused man.

The most famous trial of the eighteenth century, from a medico-legal point of view, was probably that of Eugene Aram, in 1758, charged with the murder of a man named Clark, 13 years previously. Medical evidence was called to prove the identity of certain bones which had been discovered and were alleged to be those of Clark, whose disappearance had remained unexplained for so many years. The witnesses deposed that the bones were those of a male of Clark's age and stature, and that death had been caused by a crushing blow on the base of the skull. This evidence undoubtedly played its part in the conviction of Aram and his execution.

Developments in Great Britain

These are simply a few of the more famous or interesting instances of medical evidence up to the second half of the eighteenth century, and, of course,

occasional related articles had appeared in one or other of the journals which had come into being. So far, however, there had been no systematic study or teaching of forensic medicine in Britain, and no comprehensive British work on the subject. In 1788, the first step towards repairing the latter deficiency was taken when a volume was published by Dr. Samuel Farr entitled *Elements of Medical Jurisprudence*, which professed to be a "succinct and compendious description of such tokens in the human body as are requisite to determine the judgement of a Coroner and Courts of Law, in cases of Divorce, Rape, Murder, etc., to which [are] added Directions for preserving the Public Health."

About the same time, in Edinburgh, an even more significant development was taking place. In 1789 Andrew Duncan (1744-1828) was appointed Professor of the Institutes of Medicine (or Physiology) in the University there, and almost forthwith he began also to give a course of lectures in medical jurisprudence and public hygiene. He was thus the first in Britain to give systematic instruction in these subjects, and his interest and enthusiasm were such that before the end of the century, in 1798, he prepared and presented a *Memorial to the Patrons of the University of Edinburgh*. In it he gave what he called "A short view of the Extent and Importance of Medical Jurisprudence, considered as a Branch of Education." He used the term "medical jurisprudence" to cover both "medical police and juridical medicine" and proceeded to review their respective fields.

Some years later, in 1806, this *Memorial* was brought to the notice of the Government of the day by the Lord Advocate, with the fortunate result that in the following year, 1807, the Crown created in Edinburgh University the first British chair of medical jurisprudence. The step was not taken lightly, nor was there any lack of criticism and opposition. Some of the remarks passed in the Commons debate are worth recalling. One of the speakers declared that he was at a loss to understand what the Ministry could mean by the establishment of a professor of medical jurisprudence in Scotland; he could not comprehend what was meant by the science. Canning, then in opposition to the Ministry of Fox, said that he could only account for the appointment by supposing that in the swell of insolence, and to show how far they could go, the Government had said, "We will show them what we can do; we will create a professor of medical jurisprudence." By this time the course of instruction in medical jurisprudence had been largely taken over by Duncan's son, also named Andrew, and Andrew Duncan, secundus, became the first incumbent of the new chair in 1807.

The creation of the chair was not simply a matter of local importance. It stimulated interest in medical jurisprudence throughout the country, and from this time onwards we can consider the influence of British forensic medicine as well as that of the older Continental streams. In 1816 the first creditable book on forensic medicine in English was published by Dr. Male, of Birmingham, who in the preface acknowledges his great indebtedness to Professor Duncan, many of whose observations were quoted. About the same time courses of lectures in the subject were started by Dr. Harrison in the old Medical Theatre of Windmill Street, by Dr. Elliotson in the Anatomical Theatre at Southwark, and by Dr. John Gordon Smith in the Westminster Hospital and University of London. The last-named,

in 1821, published a comprehensive work entitled *Principles of Forensic Medicine, systematically arranged, and applied to British Practice*, which went through three editions in the next six years. In spite of this apparent success, it is sad to record that Dr. Gordon Smith died in 1833, at the age of 41, after 15 months' imprisonment in a debtors' prison.

In Edinburgh, Andrew Duncan, secundus, occupied the chair till 1819, when he followed his father as Professor of the Institutes of Medicine. Duncan wrote no large volume on the subject of forensic medicine, but his course of instruction and his essays and reviews in the *Edinburgh Medical and Surgical Journal*, of which he was editor, had a widespread influence. William Pulteney Alison was Professor of Medical Jurisprudence for a short period till 1822, when he was succeeded by Robert Christison (1797-1882). Christison will be remembered as perhaps the first and the greatest of our British toxicologists, and in 1829 he published his important *Treatise on Poisons, in relation to Medical Jurisprudence, Physiology, and Practice of Physic*. To the knowledge of toxicology he made many contributions, of which perhaps his work on oxalic acid, lead, and arsenic poisoning deserve special mention. He figured as medico-legal adviser to the Crown in many important cases, including the investigation of the notorious Burke and Hare murders, and his subsequent articles on the subjects of asphyxia and bruising are excellent. A contemporary account says of him that, "as a witness, he was remarkable for a lucid precision of statement, which left no shadow of doubt in the mind of the Court, Counsel, or Jury, as to his views. Another noteworthy characteristic was the candour and impartiality he invariably displayed." He remains one of the great figures in whom the University of Edinburgh will always take a great and legitimate pride. Thomas Stewart Traill succeeded Christison in the chair when the latter transferred to the chair of *materia medica* in 1832, and continued in it for 30 years.

In London, besides those already mentioned, Dr. Michael Ryan began a course of lectures in the Westminster School of Medicine about 1821, and 10 years later published the first edition of his *Manual of Medical Jurisprudence and State Medicine*, for which he drew extensively and judiciously upon the works not only of the Continental authorities but also of Christison and others of his British contemporaries. It is also worth while recording the appearance of a large work on medical jurisprudence, in three volumes, by the collaboration, for the first time in Britain, of a doctor and a barrister. This was the work of Paris and Fonblanque, which appeared in 1823 and has been rightly described as an elaborate and scholarly production. Then we come to another notable landmark—namely, the appointment in 1834 of Alfred Swaine Taylor as Professor of Medical Jurisprudence at Guy's Hospital Medical School. Two years later he published the first edition of his *Elements of Medical Jurisprudence*, which, besides running to many editions itself, foreshadowed his future notable work *Poisons* (1848), and the deservedly famous *Principles and Practice of Medical Jurisprudence* (1865). Ten years after Taylor's original appointment at Guy's, King's College followed suit by appointing Dr. William Guy as Professor of Forensic Medicine in 1844.

In the interval a chair had been created in Glasgow University (1839), the first incumbent being Robert

Cowan. Cowan died two years later, and was succeeded by Dr. Harry Rainy, who continued in office until 1872. In Aberdeen, Francis Ogston started lecturing in medical jurisprudence in the same year as this Glasgow chair was created, but it was not till 1857 that he became professor of the subject there. In passing, it may be remarked that no further chairs in forensic medicine were created till very recently, and that, in fact, certain of the chairs which had been created were, in my view mistakenly, allowed to lapse.

Progress in Medical Investigation and Evidence

Enough has been said to indicate the tremendous awakening of interest in forensic medicine which occurred throughout Britain during the first half of the last century. The development of the subject meant that in greater and greater detail the progress being made in the medical and allied sciences was more and more closely applied to the requirements of the law. The standards expected in medical investigation and in medical evidence were revolutionized, and the place of medical opinion in the British legal system became more important and more clearly defined.

During the same period matters had not remained unchanged in other lands. In France the stature of Fodéré as an authority in medical jurisprudence, already considerable, was increased by the publication in 1813 of his greatest work, in six volumes, covering every aspect of forensic medicine and public health. It is a tremendous and learned compilation, and one which assures for its author a notable place in the history of the subject. He was not left long in his pre-eminence, however, for the name of Orfila was soon to stand at least equally high. Orfila was a Spaniard, a native of Minorca, who graduated in medicine in Paris in 1811 and subsequently became Professor of Legal Medicine in that city. From the time of his graduation he devoted himself largely to the study of chemistry and toxicology, and in 1814 published the first edition of his *Treatise on Poisons*. This work, which may be regarded as the foundation of experimental and forensic toxicology, went through many editions and was translated into several languages. Orfila's fame in this particular branch of science attracted many pupils, among them Robert Christison, of Edinburgh, whose interest and accomplishments in the field of toxicology may be said to have been due to the inspiration of his great master. But, though first and foremost a toxicologist, Orfila was a great all-rounder, and his *Leçons de Médecine Légale*, which appeared first in 1821 and also ran to several editions, covers the entire subject. Orfila's fame tends to overshadow that of his contemporaries, but of these there are several who merit comment in their own right, including Capuron, Lecieux, and Renard, while Devergie, also Professor of Legal Medicine in Paris and author of an important volume on the subject first published in 1836, achieved a measure of fame and influence which rivalled even that of Orfila.

In Germany, over the corresponding period, the influence of Plenck and Metzger persisted, both in the authority of their own published works and in the progress made by those who had been their pupils. The number of professorial chairs increased still further, and many of their occupants made their own significant contributions. Indeed, it would be difficult and tiresome to attempt a complete list of the prominent medical jurists from Germany and Austria at this time, and a very limited selection must suffice. Perhaps the Berlin

school was most distinguished and active, and here we find successively the names of Hecker, Henke, and Wagner, and finally that of Johann Ludwig Casper, professor in the University of Berlin, and forensic physician to that city. Casper died in 1864, shortly before the completion of the English translation of his handbook, which was published between 1861 and 1865 in four volumes by the New Sydenham Society, to whom all British students of the subject should be duly grateful. Of all the Germans of the period under consideration, Casper most deservedly ranks alongside the distinguished French authorities Orfila and Devergie.

By 1850, then, we may say that the teaching of forensic medicine was widely established in Britain and on the Continent, and its effects were to be seen in the increasingly skilled and authoritative use made of medical evidence in courts of law. As the century proceeded, the great progress made in medicine meant that such evidence could become increasingly precise and valuable. It is necessary only to mention the names of some of the outstanding figures—Helmholtz, Ludwig, Claude Bernard, Hughes Bennett, Virchow, Koch; or Addison, Bright, Mackenzie, Corrigan, Lister, Liston, Simpson—to remind you how great that progress was. In the same way, the march forward of forensic medicine to the threshold of our own day and generation can be indicated by a recital of names which become increasingly more and more familiar. In Edinburgh, for example, I need only interpose the name of Douglas McLagan between those of Traill and Littlejohn to bring us into the present century. In London, Taylor died only in 1880, and the name of his successor, Thomas Stevenson, brings us very close to the comparatively modern days of Dr. F. J. Smith, of Guy's Hospital, and Ferrier, of King's College. On the Continent, we can note not only a similar progression of names, such as Brouardel, Tardieu, Maschke, etc., but also the rise of forensic establishments at Copenhagen, Ghent, Stockholm, Helsinki, and other national centres, and also the re-emergence of modern forensic medicine in Italy. It is worth remarking on the great development of applied medical jurisprudence in certain parts of the British Empire overseas, especially India, where it is associated with the names of Chevers, Lyon, Waddell, and others, and the development of a complete system in Egypt.

Medical Jurisprudence in America

In the United States forensic medicine has made rather uneven progress. A good and relatively early start was made in 1813, when Dr. J. S. Stringham was appointed Professor of Medical Jurisprudence in New York. Professor Stringham studied medicine at Edinburgh, where he qualified M.D. in 1799. No doubt, therefore, he was influenced by the teaching of the Duncans there. Many of the other medical schools quickly followed suit, and soon the inclusion of a course of medical jurisprudence became an almost invariable feature in America's medical curricula. One appointment which deserves special mention was that of Dr. T. Romeyn Beck as lecturer in the subject at the Western Medical College, New York State. This was in 1815, and in 1823 Beck published the first edition of his *Elements of Medical Jurisprudence*, which, no less than the numerous enlarged subsequent editions, has always been recognized as an outstanding book, comparing very favourably with any other work in the English language of a corresponding period.

The outlook for American forensic medicine thus looked very favourable. Somewhat surprisingly, therefore, we find, in 1876, a well-known American medical professor and dean, Professor Stanford Emerson Chaille, expressing himself very forcibly on the deplorable condition of medical jurisprudence in the United States. He bitterly criticized the legal system which permitted the appointment of coroners to remain a political lottery, with the result that incompetent men remained in office only a short time before giving way to others equally incompetent. He was critical, too, of the choice of incompetent medical examiners to carry out the necropsies and other inquiries in medico-legal cases. He also demonstrated how the teaching of the subject had fallen on evil days. In some colleges the course had been dropped altogether. In others it had become tacked on to some other subject as an unimportant appendage. In many, the teaching of medical students was carried out by a lawyer. Obviously the high hopes of early days had not been fulfilled, and it is to be feared that the handicaps to American medical jurisprudence continued to operate long after the date of Professor Chaille's strictures.

Within the present century, however, considerable improvements have taken place. Many State or city communities now have skilled medical examiners to whom all medico-legal cases are referred, and in a number of the leading medical schools medical jurisprudence is receiving greater attention. Among the modern American authorities are included the well-known names of Markland, Helpert, Leary, Gettler, and others. At Harvard, within recent times, the department of legal medicine has received great stimulation from Moritz and Hubert Winston Smith on the medical and legal sides respectively. It is probably not too much to hope that, in this field as in so many others, we may look for outstanding developments on the other side of the Atlantic.

Effect of Increased Specialization

One inevitable effect of the advance in knowledge was increased specialization. Soon the two branches of State and legal medicine became too large to be covered by the same umbrella, and Medical Police became a separate entity and went its own way as Public Health, the divorce being largely completed by the end of the nineteenth century. In the same way, the rapidly developing subject of psychiatry came gradually, and rightly, to absorb much of the work which had hitherto been included within the province of the medical jurist. So the scope of forensic medicine proper came to have its present-day dimensions, but, especially in recent years, even within this field there has of necessity been a great deal of specialization. The forensic pathologist, the forensic serologist, and the forensic toxicologist are each well-nigh specialists in their own right, and the present-day problem is largely one of providing establishments or institutes where a combination of these specialists can suitably operate as a team when necessary. Different countries have tackled the problem in different ways, and, while it is not my intention to deal with this subject here, it might be remarked that the arrangements in Britain are not yet ideal.

A further development is the closely related increase in the scientific investigation of crimes other than those involving the person—safe-breaking, housebreaking, fraud, etc.—or, of course, of material relating to crimes of violence other than the actual person of the

victim or the assailant. It is interesting to note that Paris and Fonblanque, 130 years ago, foresaw the possibilities in this direction, but, foreseeing also the immense widening of the field which it entailed, they deemed it wiser to concentrate on more purely medical matters. To-day, however, the field of forensic science has been widely explored, and on many occasions we must call for the co-operation not only of the surgeon, the obstetrician, the anatomist, the pharmacologist, etc., but also of the botanist, zoologist, entomologist, physicist, chemist, geologist, and others. It is not part of the medico-legal expert's task to be competent in all these spheres—that is an impossibility for any man; but it is incumbent upon him to realize just when it appears proper to invoke the co-operation of one or more of these specialists. There was perhaps a time when the progressive development of medical specialization seemed likely to render the medical jurist out of date or redundant. It seems to me that it is being more clearly realized to-day that that view, if it was ever seriously held, is a misapprehension, and that the need for sound teaching in forensic medicine and for the existence of specialists in the subject is greater to-day than it ever was. The study of forensic medicine should not constitute a major hurdle for the student on his long route to graduation, but it remains true to say that his medical education is incomplete if he finishes his studies without having had some instruction in the subject. I am very gratified to note that this view seems to be increasingly shared among those responsible for the programme of studies at the various medical schools, and that in a number of cases steps have been taken to establish a new department or to strengthen an existing one. I believe that the policy which this reflects is thoroughly sound, and I hope we may see still further developments in this direction.

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SUCCESSFUL BREAST-FEEDING*

BY

F. CHARLOTTE NAISH, M.D.

At all times "fashion" has played a considerable part in the degree of breast-feeding. From being unfashionable in the eighteenth and nineteenth centuries, breast-feeding passed at the beginning of the present century into another phase in which most women fed their babies. The common practice, however, was to feed every two hours—and sometimes as often as half-hourly. No doubt there were "feeding problems"; but there is no reason to suppose that breast-feeding was a general failure. In order to solve the problems some observers—among the first was Waller (1915)—established the existence of a conditional periodicity in the breasts. At once an army of non-thinkers set up a fashion of rigid regimentation—a fashion which was hollow and stupid, as often there was no feeding problem to solve. It produced a reaction, since the 1939–45 war, in the shape of "demand feeding," which, slavishly followed by unin-

telligent people, probably leads to just as much dyspepsia and trouble as the clockwork method. In my opinion all such fashions originate with people who read but do not understand the findings of original observers. The truth lies, as is often the case, on the middle road; and each nursing couple is an individual problem, to be studied as such.

The fashions I have mentioned have spread from medical circles to the general public. There are some that are more or less limited to professional circles. The large number of babies being underfed at the breast led Pritchard (1913) and others, following Pierre Budin (1900), to introduce test-feeding as a method of safeguarding the infant's food intake. This also was reduced by non-thinkers to a set of rules to be slavishly followed, and provoked a reaction—too violent, as usual—so that now test-feeding and even regular weighing of young babies are being decried as "never necessary."

I have found that with increasing experience and study of infant feeding I can manage with much less test-feeding, and now use it only to solve a problem or to strengthen a mother's confidence. It would be quite another thing to recommend that attitude to others as a starting-point. I think they too should work their way to it.

All these violent fluctuations of practice are so many red herrings that obscure the real and unchanging problem. We are dealing with a race of women among whom there are good, medium, and poor milkers. We ought to know the proportion of these groups; but this is very difficult to discover from the data now available.

What is the significance of the figures shown in Table I? The more I ponder them the more I am convinced that only two principles can explain them: success depends on continual supervision and on the

TABLE I.—Incidence of Breast-feeding

Series	Babies Artificially Fed at 8 Weeks	Babies Still Breast-fed at 3 Months	Babies Still Breast-fed at 6 Months
Naish (1949) (100 cases) ..	21	67	65
" (50 cases unpublished) ..	17.5	71	—
Finlay (Spence, 1938) ..	—	55	—
Brewis (Spence, 1938) ..	—	58.4	—
Williams (1947) ..	22	73	—
Hughes (1942) ..	—	41	—
Lewisham* ..	15	—	—
Southport* ..	76	—	—
West Sussex* ..	20	—	—
Cornwall* ..	55	—	—
Waller (1946) (100 treated antenatally)† ..	—	87	83
Waller (1946) (100 not treated antenatally)† ..	—	65	42

* Quoted in *Maternity in Great Britain*. Oxford University Press, London.

† 200 cases in same hospital.

encouraging attitude of those in attendance; and success breeds success through the altered expectations of the mothers in the district. If this is so, the figures reveal next to nothing about the proportions of good and bad milking strains in the population.

Dr. Waller obtains the best results because, alike in the antenatal phase, in the puerperium, and in the follow-up of the infants, his workers are a united team. I cannot get such good work done in the puerperium, because I am dependent on a variety of nurses, in different nursing-homes or on different districts, who are not directly under my control. For the rest of the country also the results vary with the attitude of the

*Read in opening a discussion in the Section of Child Health at the Annual Meeting of the British Medical Association, Liverpool, 1950.