J.H. van Bemmel

Institute of Medical Informatics,
Erasmus University Rotterdam,
Rotterdam, The Netherlands

Commentary

The Need for a Philosophy of Medical Informatics

Reflections on F. Grémy's paper:
The Future of Medical Informatics

This series of reprinted articles from the past would certainly be incomplete without a publication from Professor F. Grémy. In the beginning of the development of our profession he had a chair in Biophysics and Biomathematics at the University of Paris, where I visited him for the first time in 1967 during a WHO scholarship [1], and later at the university in Montpellier. François Grémy has educated an impressive series of disciples who now, in turn, also possess chairs in medical informatics at different universities in France. Besides being a scientist who contributed to the advancement of medical informatics, he gradually also developed to a philosopher who over the years published reflections on the future of medical informatics.

Science and Philosophy

Looking back, it is impressive to see how sharply Professor Grémy was able to predict the future of our field and we may state that some of his early visions even stretch into the next century. In short: François Grémy not only loves science, but also – perhaps even more – philosophy. In that respect I am fully at his side and, therefore, I was most happy to have been invited to express my own thoughts in June 1996, during a Symposium in Paris, given in his honor at the occasion of his retirement [2]. The name of this Symposium was, most appropriately, called: *La Fête à François.*

Before giving my commentary on his visionary article from the past, I cannot resist to repeat a small part from my lecture during *La Fête à François*, in which I made an attempt to make some comparison between the world visions of François Grémy and two other famous French philosophers, Blaise Pascal and René Descartes. Professor Grémy has opened our eyes to the specific character and the intrinsic limitations of medical informatics and, more particularly, the specific place and responsibility of man amidst science and technology. This view also underlies his reprinted article. Blaise Pascal, the great physicist and mathematician, philosopher and theologian, also had a deep-rooted view of man and the world in which he lives, by saying in his Pensées ("Thoughts"): *l'homme n'est qu'un roseau, mais c'est un roseau pensant* (man is only a rose, but he is a rose that thinks) [3]. This thought of Pascal expresses beautifully both the frailty (*un roseau*) and the greatness of a human being (*un roseau pensant*). The French philosopher Descartes expressed the same thought by concluding that man can think, so he exists (*cogito ergo sum*). These two views indicate the very special abilities and gifts of humans, of high importance when caring for other people in the framework of health care.

The Future of Medical Informatics

François Grémy's article: *The Future of Information Processing in Medicine and Public Health* of 1980 [4] is partly based on a lecture he gave in Grenoble, in September 1977, published in 1979 under the title: *Avenir de l'Informatique Médicale* [5]. In his 1980 publication, a definition is given of the field of medical informatics. He distinguishes three application domains: (1) the support of medical actions and decisions, (2) support of medical teaching, and (3) support of policy making in health care. Regarding the first domain, he mentions the use of patient data, stored in computers, for the furthering of medical knowledge and concludes that the systems of that time were only poorly able to support medical actions because temporal and dynamic aspects were only partially taken into account. He further concludes that the systems of that time only offered "external" support to clinicians and were not involved in professional medical activities. Professor Grémy,

however, foresaw a revolution in information technology, including microminiaturization and a sharp decline in prices of hardware that would greatly help the introduction of computers for the benefit of health care.

We should realize that, at that time, the cost of computing was very much higher than today and systems were inaccessible; present networking, let alone the Internet, was non-existent, the PC was only recently introduced and client-server technology was not yet conceived. Therefore, the prediction that the seamless availability of hardware and powerful software would greatly stimulate medical informatics for the benefit of health care, was a very visionary forecast and more than only an extrapolation of a global trend in informatics.

Computers Serving Health Care

He called the proliferation of small computers and the introduction of networking the "*democratization*" of computing, realized by the successors of the ARPA network existing at that time, now known as the super-highway for computing. He mentions the future disappearance of complicated operating systems and the arrival of portable computers and "quasi free-of-charge" computing, now realized in the form of laptop computing and easy access to low-cost networking, such as offered by the world-wide web. He predicted for health care in particular a few significant changes: (1) "intelligent" instrumentation, (2) large databases, accessible through networks even from the patient's home, (3) computer-supported consultation, using techniques from artificial intelligence, and (4) breakthroughs in the modeling of dynamic processes.

My reaction is that his vision was very precise, albeit that some of his predictions have not yet fully matured, such as the introduction of decision-support systems. I am convinced that the advancement of such systems waits for the accomplishment of computer-based patient record systems that contain structured patient data and have incorporated standards for data communication and integration with decision-support systems.

Mastering Information

In addition, he foresaw an exponential growth in the knowledge a clinician is confronted with, evident from the rapid increase in the number of accesses to MEDLINE. In parallel to this, he mentions the ever-increasing content of the medical record. You almost heard him sighing, when he wrote: "*How to master information?*" He realizes that, as a consequence of all this, the responsibility of care providers is continuously on the increase. More data, he utters, does not imply better decisions – on the contrary. He also concludes that health care is one of the few domains of human activity that spends the least for its own control and evaluation. There is a need for a *Methodology of medical action*, he writes, to solve the crisis of modern medicine, that is, that of overload. In a later article published in 1983 [6], Grémy expressed the hope that teaching information sciences in medicine would perhaps help in solving the present crisis in health care.

My opinion is that this view is even more true today than almost 20 years ago. Perhaps, this will be one of the great challenges for medical informatics in the next decade. Researchers in medical informatics should tackle this problem in close collaboration with clinicians and researchers in, for instance, the field of medical technology assessment.

Formalization

The interaction between medicine and informatics is, according to Grémy, not primarily a technological miracle, but a deeper reflection on medicine itself. There is a need for "metamedicine" and for more *formalization and systematization* and, as a consequence, the introduction of protocols. Long before the FDA and other institutions took up the challenge to do so, he made a plea for a strict evaluation of advanced medical technology.

Changing Ethics

All this, according to Professor Grémy, also leads to a change in the relationship between patients and clinicians and a greater responsibility of paramedical personnel. However, he does not believe that computers will be able to assist patients in making decisions concerning their own care. Not surprisingly, he makes a strong plea for redefining the ethics of using computers in health care. For instance, it would be better if patient data are not widely distributed, but remain close to the point where they were collected, for instance, the ward or the department. Although at that time the man-machine interface was awkward (hardly any graphics support), he was optimistic about future communication between users and computers. He concludes his article by expressing the hope that a new paradigm for medicine will emerge. He believes that medical informatics, together with epidemiology, is able to contribute to the transformation of medical thinking.

Conclusions

With the visions expressed in these last two sections, I can only wholeheartedly agree, as I also expressed in the introductory sections above. The respect for mankind is of particular importance when we introduce computers into health care. In fact, the thoughts expressed by François Grémy

have much in common with the theory of medical informatics, developed by the late Marsden Blois, of whom also a contribution has been republished in this Yearbook [7] and to which I have also attempted to add some thoughts on several occasions [8-10]. We need scientists and philosophers, such as Professor Grémy, who possess a view on reality, which transcends medicine and informatics and, particularly, medical informatics.

References

1. Van Bemmel JH. *Computers in European Hospitals*. Report for the World Health Organisation. Utrecht: Institute of Medical Physics TNO, 1967.
2. Van Bemmel JH. Les conditions pour la communication électronique dans le domaine de la santé publique. Symposium "*La Fête à François*". Paris, 1996.
3. Pascal B. *Pensées*. Paris: Éditions Garnier Frères, 1958.
4. Grémy F. The future of information processing in medicine and public health. Comput Progr Biomed 1980;11:71-80.
5. Grémy F. Avenir de l'informatique médicale. Revue Médicale de Liège 1979;34:602-9.
6. Grémy F. Why teach information sciences in medicine? Will they contribute to a solution in the present crisis of medicine? (Editorial) Meth Inform Med 1983;22:121-3.
7. Blois MS. *Information and Medicine: The Nature of Medical Descriptions*. Berkeley CA: Univ of California Press, 1984.
8. Van Bemmel JH. A comprehensive model for medical information processing. Meth Inform Med 1983; 22:124-30.
9. Van Bemmel JH. The structure of medical informatics. Med Inform 1984;9:175-9.
10. Van Bemmel JH. Medical informatics, art or science? Meth Inform Med 1996;35:1-7.

Address of the author:
Jan H. van Bemmel,
Institute of Medical Informatics,
Erasmus University Rotterdam,
P.O Box 1738,
3000 DR Rotterdam,
The Netherlands.
E-mail: vanbemmel@mi.fgg.eur.nl