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The Origin of AIDS:
An hermeneutical analysis
of the scientific publications

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*Chiaramente a loro,
mamma e papà*

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INTRODUCTION

The word "AIDS" is probably one of the most used new terms in the last two decades. It appears in thousands of books, in articles of specialized and lay press, in radio, television and internet. It also exists in the languages of probably every continent.

AIDS has been the cause of important social and cultural changes, but it is a new term which absolutely didn't exist before the eighties. What is AIDS? AIDS was born as the acronym for Acquired Immune Deficiency Syndrome, and was intended to mean «*a breakdown of the immune system that renders individuals vulnerable to a variety of serious opportunistic diseases*»¹.

AIDS is something new. But what is new? Is it just a new word, invented for social, political or economical interests? Is it a new definition of different pathologies, which only recently have been combined under the same cause, but which were already present in humans? Or is it a new infectious disease in humans? Or again, is it an old infectious disease, which only recently has become visible and epidemic? The question *AIDS-A New Disease?* posed in the title of an article of *Science* in 1992, resume all the above listed interrogatives².

Trying to answer to these questions means to ask about the “origin of AIDS”.

This work aims to resume and re-interpret the knowledge about the origin of AIDS.

This need comes from the following reasons:

- The AIDS pandemic is a tragedy of huge dimensions with a very high number of victims;
- The consequences of the pandemic will have a devastating impact on future generations and on the finances and societies of many nations;
- The AIDS pandemic is a modern tragedy, which reposes again the question of the big epidemic of the past;
- The research of a cure against AIDS catalyses huge investments and interests;
- The question of the origin of AIDS has been at the center of many controversies (i.e. Duesberg's theories)

¹ Melloni's Illustrated Medical Dictionary, second edition, 1985, Williams & Wilkins, 1985

² (KRAUSE, R. M., *Science*, 1992)

- There is a perception in the general people of a human responsibility in the start and spread of the epidemic.

This work develops particularly both from the controversy derived from the Oral Polio Vaccine Theory (OPVT), that hypothesizes that contaminated oral polio vaccines are the cause of the passage from monkeys to humans of a monkey virus ancestor of HIV and from the perception of a human responsibility in the origin of AIDS.

The citizen, or whom is representing him, often is confronted to and needs to take a position on specialized and complex topics. In some of these situations the citizen express his opinion through the vote³ (Genetic Modified Organisms, nuclear energy, public finance are examples), in others he decides his own behavior (alternative medicine, biological food), and in some others he just makes up his own mind as a cultural knowledge. In this last category are for instance the controversy about the fact that the USA men has really been on the moon in 1969, or 9/11 controversy. How can the citizen develop his own opinion? Which approach should he use?

This work wants then to be a first overview of the topic “origin of AIDS”, to understand where the internal controversies are localized, which are the different positions, which are the knots to be undone.

Finding the relevant documentation often represents a first problem, because it is often fragmented in different media: journals, TV programs, newspapers, internet. Sometimes, as for the origin of AIDS topic, the relevant material is mostly circumscribed to life sciences journals, but the quantity of journals, the limitations and the complexity of libraries’ systems, the specificity of some arguments, makes the task of acceding to the information very laborious and time consuming. Thus, this work wants to collect as much material as possible on the origin of AIDS and to present a grid of lecture which can render the topic digestible for a non specialist audience. These tasks represent the objective of a new profile of researcher, who not only popularizes the topic to non specialists, but who produces new knowledge when he offers a new *vision d’ensemble* of a topic. His work can be useful for the specialists, too, because the information of other fields of investigation are brought in.

This type of work, however, is non conclusive, which means that it does not necessarily give an answer to the open questions. If the sources and the arguments used do not allow to solve a controversy the researcher do only highlight the indetermination of the question. Such approach is evidently subjective. The philosophical tradition of the modern hermeneutics offers a key for this subjectivity, taking into account the human inevitability of having prejudices and integrating them in the discussion.

³ In countries with direct democracy like Switzerland

State of art

Many scientific articles have dealt with the topic “origin of AIDS”, whatever meanings it can be attributed to this expression (see the bibliography) and different specialists have participated to the debate: virologists, public health authorities, medical anthropologists, evolutionary biologists, geneticists, infectious disease specialists, and social scientists interested in medical and health issues.

Moreover many relevant controversies developed on AIDS and on its origins. An example is the controversy around the cause of the syndrome (the Duesberg controversy, see in the specific section).

Also in the internet a lot of material can be found. It is simply amazing to introduce the terms “origin AIDS” in *Google*, and to see how many pages come out. Many of the pages are related with the popular tendency to consider that human activity could have played a relevant role in the origin of AIDS, for instance all those which consider HIV a laboratory invention. Among these “blaming”⁴ theories about the origin of AIDS, a special place is held by the oral polio vaccine theory (OPVT). To resume it in a few words, the theory proposes that AIDS developed from contaminated vaccines used in the Belgian Congo at the end of the fifties in the world's first mass immunization against polio. The OPVT induced a long and complicated controversy which involved experts of many disciplines in the discussion, journalists as Tom Curtis, who published in *Rolling Stone* the first article on the topic⁵, Julian Cribb, who wrote the first book about the theory⁶, and Edward Hooper, author of the famous book *The River*⁷, as well as Science and Technology Studies (STS) Professors like Brian Martin⁸.

⁴ It is interesting to note how, with AIDS, a certain blaming tendency has always been present. (SONTAG, S., "Aids and Its Metaphors.", 1989)

⁵ (CURTIS, T., *Rolling Stone*, 1992)

⁶ (CRIBB, J., "The White Death.", 1996) *The White death* is the first complete account about the OPV/AIDS theory and his ‘suppression’ (see Brian Martin homepage). Cribb intervened also at the Royal Society conference. (CRIBB, J., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 2001)

⁷ Edward Hooper published in 1990 the book “Slim” (HOOPER, E., "Slim: One Man's Journey Through the Aids Zone of East Africa.", 1990), a very personal account of the East African AIDS epidemic. Then he began a nine-years-long research about the origins of HIV and AIDS, which culminate in the publication of the book *The River* (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 1999); second edition (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000), which is the richest bibliographic source and deepest investigation effort in the topic of origin of AIDS. Hooper has continued to strongly defend the oral polio vaccine theory and surely represent the main reference. A complete account about the controversy, from his point of view, can be read on his website or on Brian Martin's.

⁸ Brian Martin, Science, Technology and Society professor in Wollongong University, Australia. The central theme in his research is the dynamics of power, with special attention to strategies for challenging repression and exploitation. He was interested in origin of AIDS as a case of ‘suppression of dissent’. He contributed commenting the scientific controversy from an STS point of view, but also actively supporting the publication of Louis Pascal article (see Pascal). His website was the most complete source and bibliographic reference collection until the publication of Hooper's book *The River*. (MARTIN, B., *Nature*, 1993); (MARTIN, B., *BioScience*, 1993); (MARTIN, B., *Townsend Letter for Doctors*, 1994); (MARTIN, B., *Social Studies of Science*, 1996); (MARTIN, B., *Science as Culture*, 2000);

This theory has also had an impact on the media: a very famous documentary gave large space to the theory⁹ and a theatrical play about the controversy has been written by the author of this work¹⁰, and has been performed in the Italian region of Switzerland and in Italy.

The book by Hooper and the investigations that followed, managed to call the attention of the Royal Society of London which, with the help of the famous evolutionary biologist Bill Hamilton, one of the few scientific sympathetic with the theory¹¹, organized a meeting in 2000 to discuss the topic¹², which concluded with the declaration that the theory «*dies its final death*»¹³. Brian Martin wrote an interesting commentary about the meeting to highlight the unbalance among the positions and the use of the mass media in the scientific debate¹⁴. One year later, another meeting, completely ignored by the scientific community was then held in Rome at the *Accademia dei Lincei*, and it was dominated by Hooper's intervention¹⁵.

The OPVT catalyzed a lot of the discussion on the origin of AIDS, making the topic a mass media argument. But the OPVT is not the only plausible theory that has considered the existence of a human responsibility in the start and spread of the epidemic. Other authors have presented their theories, like Marx¹⁶ and Moore¹⁷, who points to the serial reuse of unsterilized syringes; Gilks¹⁸, who gives big importance to some malaria experiments performed with monkey blood; or Gosden¹⁹, who stresses the importance of the role played by the xenografts of monkey tissues.

Among the Emerging Infectious Diseases (EIDs), AIDS is considered as paradigmatic. In the past 30 years, anecdotally since the WHO's declaration of the victory against smallpox, a lot of EIDs have caught the attention of the specialists: SARS, BSE, Avian Flu, Ebola, etc. Many books written

(MARTIN, B., *J Med Ethics* , 2003); (MARTIN, B., *Politics & the Life Sciences* , 2001); (MARTIN, B., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001); (MARTIN, B., *Health Care Analysis* , 1998). See also his homepage.

⁹ (CHAPPELL, P. et al., , 2003)

¹⁰ (BIASCO, C., "L'origine Del Male. Storia Di Una Controversa Teoria Sull'origine Dell'aids.", 2004); video version (BIASCO, C., *DVD* , 2005); English version of the script (BIASCO, C., "The Seeds of Doom. Story of a Controversial Theory on the Origin of Aids.", 2005). Comments on the homepage: www.biasco.ch

¹¹ Bill Hamilton died of malaria contracted in Congo in 2000 during his researches on the OPVT. (MORAN, N. et al., *Nature Medicine* , 2000); (MAY, R. M., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001); (SIMINI, B., *Lancet* , 2000)

¹² (AAVV, *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

¹³ (WEISS, R. A., *Nature* , 2001); (RAMBAUT, A. et al., *Nature* , 2001); (BLANCOU, P. et al., *Nature* , 2001); (BERRY, N. et al., *Nature* , 2001); (POINAR, H. et al., *Science* , 2001); (COHEN, J., *Science* , 2001).

¹⁴ (MARTIN, B., *Politics & the Life Sciences* , 2001)

¹⁵ (AAVV, *Atti dei Convegni Lincei* , 2003)

¹⁶ (MARX, P. A. et al., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

¹⁷ (CHITNIS, A. et al., *AIDS Research and Human Retroviruses* , 2000)

¹⁸ (GILKS, C., *Nature* , 1991); (GILKS, C., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

¹⁹ (GOSDEN, R. G., *Nature* , 1992)

both for specialists²⁰ and for the general audience²¹, as well as some movies, were consecrated to this kind of diseases. An important scientific journal is devoted to this specific topic: *Emerging Infectious Disease*²², and articles on EIDs can be found in the most important scientific journals, such as in *Science* or *Nature*. One of the reasons for this interest on EIDs in the Western Countries may be their will to protect the population through health policies²³. A clear example of this phenomenon is the existence of the Centers for Disease Control (CDC) in the United States²⁴.

However, until now, just a couple of multidisciplinary researches have been done on the origin of AIDS, including both macroscopic and microscopic observations. The studies done until the present date are generally circumscribed within a discipline and do not at all or at least not fully exploit the information coming from other domains. One of the reasons for this can be that the usefulness of the results emerging from a research of this kind is not evident. Another reason can lie in the “doability”²⁵ required for doing such a research on the origin of AIDS. At a macroscopic level, as it will be shown in the next chapters, the question of the origin of AIDS is in fact a collection of different sub-questions belonging to different domains, but interdependent among them. So, for scientists, the topic is not interesting because it is not specific: it is not delimited within a precise field of investigation. Trying to answer the question of the origin of AIDS, soon a scientist can be forced to go out of the sure ground of his research specialty, losing its competitiveness and legitimacy. As the Sciences and Technology Studies (STS) Professor Martin put it:

"The origin of AIDS is not something that can be worked out solely by doing research in a lab. Arguably, it requires a combination of skills from several disciplines. In the life sciences, knowledge is needed of molecular biology, immunology and epidemiology, to understand the molecular evolution of HIV, the possibility of vaccine contamination and the patterns of spread of AIDS. In the humanities and social sciences, skills are needed to search archives, compare

²⁰ (SCHELD, W. M., "Emerging Infections (Emerging Infections).", 2004); (KRAUSE, R. M., "Emerging Infections.", 1998); (MCLEAN, A. R. et al., "Sars : A Case Study in Emerging Infections.", 2005); (HORSBURGH, C. R., JR. et al., "Pathology of Emerging Infections (Pathology of Emerging Infections).", 1997); (MORSE, S. S., "Emerging Viruses.", 1996);

²¹ (DREXLER, M., "Secret Agents : The Menace of Emerging Infections.", 2003); (PRESTON, R., "The Hot Zone: A Terrifying True Story.", 1995); (PETERSEN, W., , 1995); (GARRETT, L., "The Coming Plague : Newly Emerging Diseases in a World Out of Balance.", 1995); (RHODES, R., "Deadly Feasts: Tracking the Secrets of a Terrifying New Plague.", 1997); (RYAN, F., "The Forgotten Plague : How the Battle Against Tuberculosis Was Won--and Lost.", 1993); (RYAN, F., "Virus-X : Tracking the New Killer Plagues : Out of the Present and Into the Future.", 1997)

²² *Emerging Infectious Diseases* is published monthly by the National Center for Infectious Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, USA. Impact Factor (ISI Citation Reports, 2004) = 5.643. See also (Government, U. S., "21st Century Collection Centers for Disease Control (Cdc) Emerging Infectious Diseases (Eid): Comprehensive Collection From 1995 to 2002 With Accurate and Detailed Information on Dozens of Serious Virus and Bacteria Illnesses (Core Federal Information Series).", 2002)

²³ (BROWER, J. et al., "The Global Threat of New and Reemerging Infectious Diseases: Reconciling U.S. National Security and Public Health Policy.", 2003); (BRACHMAN, P. S. et al., "Perspectives on the Department of Defense Global Emerging Infections: Surveillance and Response System, a Program Review.", 2001)

²⁴ <http://www.cdc.gov/>

²⁵ (FUJIMURA, J. H., *Social Studies of Science* , 1987)

stories, obtain information through interviews and understand the social dynamics of the response to theories. [...] [T]he present organisation of science, based on extreme specialisation, is not suited to deal with certain types of problems that essentially require fearless and critical thinking and a willingness to incorporate ideas from a range of disciplines and avenues"²⁶.

A corollary to this point is that most of the publications about the origin-of-AIDS question results from an intra-disciplinary “do-ability” of a specific sub-question.

In the same line of thought, the scientific journalist Julian Cribb called in 2000 for an international multidisciplinary inquiry about the origin of AIDS at the Royal Society. The idea behind such an inquiry was to treat the various theories according to their merits and actively seek for valid data to sustain or refute them. His arguments for proposing the inquiry were that the topic was essential to human health, important for the prevention of new pandemics, and for protecting the integrity of science at the eyes of the public²⁷.

In a certain way this work accepts the challenge proposed by Brian Martin and Julian Cribb and tries to pursue an organized multidisciplinary research on the publications about the origin of AIDS. As the writer Edward Hooper has proved, an independent researcher can provide an interesting amount of useful information to the scientific community. In fact, his book *The River*²⁸, which represents one of the few attempts of doing a multidisciplinary research on this field, has been cited more than hundred times in scientific journals during the six years after its publication²⁹. This was also the case with the book entitled *History of AIDS*, written by the historian of medicine Mirko Grmek³⁰. As he wrote, research on the history of medicine can be useful for the life sciences. This is especially true considering his approach to history of medicine, close to medical geography.

«The integration of the history and geography of diseases is essential to understanding and revealing a true picture of epidemiology and disease patterns as they are today. [...]

²⁶ (MARTIN, B., *Science as Culture*, 2000). In the specific case of the OPVT, many of the proposers were journalists, activists or independent scholars rather than professional scientists. Brian Martin attempted to explain this phenomenon saying that «[n]o specialist alone could do what was required -- and it would also mean bucking strong resistance by some scientists to pursuing a vaccine theory» (ibid). A watchdog role has been probably the main drive for the investigation, more than the interdisciplinarity. The attention given to the theory shows clearly an interest of the public on the question.

²⁷ (CRIBB, J., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 2001)

²⁸ Edward Hooper published in 1990 the book “Slim” (HOOPER, E., "Slim: One Man's Journey Through the Aids Zone of East Africa.", 1990), a very personal account of the East African AIDS epidemic. Then he began a nine-years-long research about the origins of HIV and AIDS, which culminate in the publication of the book “The River” (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 1999); second edition (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000), which is the richest bibliographic source and deepest investigation effort in the topic of origin of AIDS.

²⁹ Based on a research in “ISI Web of Knowledge” (see homepage in the bibliography)

³⁰ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandémie Actuelle.", 1989). Mirko D. Grmek (1924-2000) is a physician and historian. His famous book “History of AIDS” has been long the main and most complete reference to not medicine experts. As he declared it is too soon to write a definitive history of AIDS but asserts that "a look back by a physician trained in historical method might be of benefit."

Understanding the mechanisms and patterns of the origin and diffusion of the infection and disease are central to developing appropriate intervention strategies for controlling its spread.»³¹

In this book and in some of his following articles³², Grmek devotes some attention to the question of the origin of AIDS, proposing his own particular explanation. His philosophy of work is not very different from the one proposed here.

Another book about the origin of AIDS is the one written by the virologist Jaap Goudsmit³³, but his argumentations are not very solid.

There are some other books about AIDS which belong to the discipline of geography³⁴.

Despite the existence of several general publications about the origin of AIDS, the following works are still missing: a bibliography on the topic; a state of art of the accepted knowledge and of the controversies about the topic; a multidisciplinary analysis of the argumentations produced until now; an evaluation of the possible new researches and their credibility.

Reasons for the research on the topic

The object of this research starts to exist at the moment in which it is recognized the need of a research on the origin of AIDS.

What are the reasons usually given to investigate in the origin of AIDS?

In the articles analyzed, mainly 4 reasons are given to justify the importance of searching for the origin of AIDS: forecast and prevention of new epidemics; control and fight against AIDS epidemic; clues for a cure against HIV; new scientific knowledge. Some citations to support them are:

- «*Understanding the origins of AIDS viruses is of obvious importance*» wrote the molecular biologist Paul Sharp, expert in phylogenetic analysis of the AIDS viruses³⁵.

- «*Our goal is to understand the evolution of these viruses and attempt to understand what caused the AIDS epidemic and [which are] the risks of future epidemics*» says Telfer, a Californian primatologist who investigated the SIVs in African monkeys³⁶.

- In two different articles, with very explicit titles, *Where did the AIDS virus come from?* and *Origin of HIV*, the retrovirologist Myra O. McClure expressed why in her opinion these kind of studies

³¹ (SHANNON, G. W. et al., *Annals of the Association of American Geographers*, 1989), see p.1

³² (GRMEK, M. D., *J Hist Med Allied Sci*, 1995); (GRMEK, M. D., *Periodicum Biologorum*, 1998)

³³ (GOUDSMIT, J., "Viral Sex: The Nature of Aids.", 1998)

³⁴ (SHANNON, G. W. et al., "The Geography of Aids.", 1990); (GOULD, P., "The Slow Plague : A Geography of the Aids Pandemic.", 1993). The title are sintomatic of the pluralism of meanings of the term AIDS.

³⁵ (SHARP, P. M. et al., *Nature*, 1988)

³⁶ (COHEN, J., *Science*, 2001)

were so important: «*The origin of AIDS remains a mystery [...] but understanding the origins of HIV and the reasons why simian immunodeficiency viruses are not pathogenic in their natural hosts may eventually help in controlling HIV*»³⁷, and «*no one can yet be certain of the origin of HIV [,b]ut in endeavoring to find a solution to this question, scientists will undoubtedly find out more about lentiviruses in general and may even discover new members of this group of viruses in both animal and people*»³⁸.

- In 1995, in an article with the title *The AIDS Pandemic is New, but is HIV New?*, three evolutionary biologists highlighted the possible «*implications for understanding the mechanisms of HIV propagation and the etiology of AIDS, for combating AIDS, and potentially for efforts to prevent future epidemics*»³⁹. Moreover they emphasized the specific interest for systematists in understanding HIV origin.

- Some authors, like the Californian anthropologist Jim Moore have questioned «*whether understanding the origins of HIV-1 will make a difference in treating AIDS*» and «*[w]hether understanding the origin of HIV and AIDS is useful for evaluating risks associated with present-day concerns*»⁴⁰. However, in his view a «*firmer grasp of what happened in the past - and what might easily have happened had circumstances been slightly different—helps society to understand these dangers and to minimize the risk of sparking the next global scourge*».

- Brian Martin, Australian-based STS professor, who followed actively the Oral Polio Vaccine Theory (OPVT) of the origin of AIDS, responding to those who, like Moore, hold the opinion that that the origin of AIDS does not really matters because it does not help to fight against AIDS today, said «*[i]n the case of nearly every other disease, an understanding of the cause or origin of the disease is considered to be valuable in prevention or cure*»⁴¹. An opinion shared by Essex and Kanki, two American virologists, who wrote in *Scientific American*: «*Thus the origin and history of the AIDS viruses themselves may provide the very information that is critical to the prevention and control of AIDS*»⁴².

- In the context of Emerging Infectious Diseases, Krause wrote in *Science*: «*These various epidemics connect the future with the past, offering lessons for guarding the health of generations to come [...] The public must be vigilant to the possibility of new epidemics, learn more about the biology and epidemiology of microbes, and strengthen systems of surveillance and detection*»⁴³. The

³⁷ (MCCLURE, M. O. et al., *Bmj*, 1989)

³⁸ (MCCLURE, M. O., *New Scientist*, 1990)

³⁹ (MINDELL, D. P. et al., *Syst Biol*, 1995)

⁴⁰ (CHITNIS, A. et al., *AIDS Research and Human Retroviruses*, 2000)

⁴¹ (MARTIN, B., *BioScience*, 1993) cfr. (SEALE, J., *J R Soc Med*, 1988)

⁴² (ESSEX, M. et al., *Scientific American*, 1988)

⁴³ (KRAUSE, R. M., *Science*, 1992)

proposal of Grmek to study the dynamics of a “pathocoenosis” (understood as “the community of diseases” at a specific moment in a specific space) is here extremely pertinent⁴⁴.

- Learn from the past to prevent the future, as the scientific journalist Julian Cribb expressed saying: *«no great human catastrophe should go uninvestigated [,i]t is essential we understand how to avoid such calamities in future»*⁴⁵.

On the other side it is possible to resume the reasons to be against the research in the origin of AIDS: the uselessness of such a research, the question of priority in the investments.

However, the topic is indeed relevant, not only for the scientific community, interested during the last decades in the question of emerging diseases or working in the new fields of research generated after the identification of the family of immunodeficiency virus, but also for the people in general, due to the social expectations which derive from the need of giving an explanation to such a tragedy, trying to determine the degree of human responsibilities in the start of the pandemic.

In fact the perception of the human responsibility in the origin of AIDS is considered in this work the major reason for the need of a multidisciplinary investigation in the origin of AIDS.

Objectives of the research

The general objective is to take part in the discussion about the origin of AIDS starting from a complete, multidisciplinary wide re-lecture of the information published about the topic.

The major aims of this work are:

- 1) to collect as much material as possible about the topic and offer a bibliography of it;
- 2) To construct the object “origin of AIDS” by deconstructing the expression, and to present a grid of lecture of it;
- 3) To analyze the main macro-controversies on the contents and to isolate the ones that are still open;
- 4) to propose new researches to try to solve the still open macro-controversies.

This work is not necessarily targeted to a specialist of a particular discipline like virology, epidemiology or medical geography, but to any person interested in having an introduction and an overview on the debates around the origin of AIDS.

⁴⁴ Grmek and Fantini; see (GRMEK, M. D., *Annales ESC* , 1969); (Fantini, B., "Aids and the Historian.", 1991); (GRMEK, M. D., "La Vita, Le Malattie E La Storia.", 1998) see pp. 22-5; 43-5. *«By drawing on the latest discoveries in virology, microbiology, and immunology, Mirko Grmek depicts the AIDS epidemic not as an isolated incident but as part of the long, but far from peaceful, coexistence of humans and viruses»*, Editorial of History of AIDS, 1993

⁴⁵ (CRIBB, J., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

Material and Methods

This research is concentrated on the scientific publications dealing with the question of the origin of AIDS.

The work is based on the idea that nowadays science should be considered in a new relation with politics and citizens, in a dialogue that considers science as a “service” and the citizen as a “competent client”. The central position of the informed citizen is also that of a controller, with the ability to participate and to direct the research. Understanding and interpreting is then part of his rights and needs⁴⁶. In this context the author of this research assumes the position of a consultant of the informed citizen with the task of preparing, in a defined time, an accessible report, which offers the best overview possible of the topic.

In other words, considering what has been said about the origin of AIDS, in particular in the scientific environment, what are the conclusions, which degree of credibility do they have and which consequences derives from them?

The work is then “scientific” in the sense that it documents the answers given to present day questions and aims to produce new knowledge. However, in the discourse reflections on a political, social or sociological level can be included, that means that the work follows a “constructivist” vision, where the knowledge is concerted⁴⁷.

The approach that will be used in the present work takes distance from the approach used inside the micro-historical tradition, in the sense that it concentrates on the contents of the texts, the rhetoric and their socio-political impact, rather than on the actors, their interactions and their objectives at their time. The focus is put on the present day questions, from the point of view of the interpreter. The reconstruction of the system of references of a text, however, is essential to understand it and to try to avoid some “anachronisms”.

This is not a social constructivist work either, because the question of why the actors acted the way they did is not analyzed if is not pertinent to the actual interpretation. However, some references to Science and Technology Studies (STS) works are done, but they are basically used as models of interpretation, trying to distinguish between conceptual, social, political arguments⁴⁸: «*The sociologist or historian tries to open up the black box to expose the loose ends and forgotten*

⁴⁶ I'm thankful to Francesca Terri for his suggestion on this point.

⁴⁷ «As well as focusing on how facts are constructed, controversies resolved, networks built, boundaries negotiated, and publics (mis)understood, would it also make sense for STS scholars to analyse roads not considered, projects not begun, methods ignored or dismissed out of hand, and technologies not explored systematically?» (WOODHOUSE, E. et al., *Social Studies of Science*, 2002).

⁴⁸ An example is the ‘dream team’ of lawyers used STS techniques to proof the innocence of OJ Simpson in the famous trial.”

controversies which are hidden beneath an apparent consensus in the relevant technical communities»⁴⁹.

In this kind of work there is no pretension of objectivity but the opposite, the interpreter and his prejudices are included in the discussion. This kind of approach allows to squeeze the sources in order to obtain new interpretations and analyses, in which the point of view of the analyzer is manifestly integrated. It is not clear if the results are concentrated more on the contents or on the social aspect of the controversial positions.

The methodology itself is discussed and chosen to better fit the sources, so it becomes a variable, too⁵⁰.

The final report of the interpreter, clearly communicative to cope with the interest of the target reader, becomes a part of the methodological choice. Examples of this approach are the books of both Grmek and Hooper, who following very different methodologies share their interest in a popularization component.

Thus, the present work belongs more to an hermeneutical tradition⁵¹. In a certain way, the intention of this work is to try to demonstrate that by applying a hermeneutical approach to the published material about the origin of AIDS, a relevant point in the scientific discussion can be done by making a bit of order in the existing confusion of suggestions, argumentations, and theories. Some of the new approaches of anthropology⁵² should be considered as general references, given the interest of medical anthropologists on the topic:

«Recognizing the complexity of the diverse sociocultural processes involved in the re/emergence of infectious disease, many researchers in biology, medicine, and public health are calling for input from the social and behavioral sciences. With its integrative approach to complex biocultural issues, anthropology is well positioned to make significant theoretical and practical contributions»⁵³.

At this point there are two questions one can ask: can an interpretation of the texts on the origin of AIDS bring any new knowledge and go beyond the intentions of the authors? And, can I make this

⁴⁹ (LYNCH, M., *Social Studies of Science*, 1998); See also (LYNCH, M. et al., *Social Studies of Science*, 2005)

⁵⁰ The evident reference is to systemics. (Telfener, U., L. Casadio, "Sistematica. Voci E Percorsi Nella Complessità.", 2003)

⁵¹ In that sense, this work probably belongs to the hermeneutical tradition, as it is understood by philosophers like Gadamer and Ricoeur. (GADAMER, H.-G., "Philosophical Hermeneutics.", 1977); (GADAMER, H.-G. et al., "Truth and Method (Continuum Impacts).", 2005); (RICOEUR, P. et al., "Le Conflit Des Interprétations : Essais D'herméneutique.", 1984); (RICOEUR, P. et al., "History and Truth (Spep).", 1992); (RICOEUR, P. et al., "Hermeneutics and the Human Sciences : Essays on Language, Action and Interpretation.", 1981).

⁵² as the ones of Bateson or Geertz (BATESON, G., "Steps to Ecology Mind.", 1980); (BATESON, G., "Mind and Nature.", 1980); (GEERTZ, C., "Works and Lives: The Anthropologist as Author.", 1990); (GEERTZ, C., "Interpretation of Cultures (Basic Books Classics).", 2000).

⁵³ (BARRETT, R. et al., *Annual review of anthropology*, 1998), see p. 248.

work better than a virologist or an epidemiologist⁵⁴? The answer to the first question emphasizes the importance of the knowledge that can appear by intertwining the information belonging to different texts and disciplines. For the second point the work can be developed choosing a methodology that fits better the potential of the sources without been tied to a disciplinary methodology.

Structure of the work

The work is organized in three chapters, which in turn are subdivided in sections. In the first chapter the central concept of this work, the “origin of AIDS”, is analyzed and it is explained that it has different possible semantic interpretations (first section). The idea is to leave the definition of the expression “origin of AIDS” as open as possible to include all its potential interpretations and to organize all the local discourses. That means that the object “origin of AIDS” is essentially constructed. The scientific discourses about the origin of AIDS usually adopt the form of theories or hypotheses, and it is shown that these different hypotheses are incomparable among them, not only because of the semantic pluralism of the expression “origin of AIDS”, but also because they do not accept the same background knowledge (section 2). The different ways in which some authors have approached the problem of categorizing the theories or hypotheses about the origin of AIDS are also considered (section 3). The central result of the chapter will be the proposal of a grid of lecture of the topic, which allows to deconstruct each hypothesis in its components making them comparable to other proposals (section 4). The last section is then dedicated to the perception of a human responsibility in the origin of AIDS (section 5).

In the second chapter, a map of the topic “origin of AIDS” is constructed, which can be used both to contextualize the present controversies and to easily situate any new additional discourse on the origin of AIDS that can appear. The chapter includes 4 sections that represent the four main interpretations of the expression “origin of AIDS” and a fifth in which the map of the topic is resumed.

In the third chapter a plan for further researches is presented and commented.

After the conclusions there is an essential bibliography on the topic “origin of AIDS”.

⁵⁴ About the question of legitimacy can be interesting the reading of (COLLINS, H. M. et al., *Social Studies of Science* , 2002); (GORMAN, M. E., *Social Studies of Science* , 2002); (JASANOFF, S., *Social Studies of Science* , 2003); (WYNNE, B., *Social Studies of Science* , 2003); (RIP, A., *Social Studies of Science* , 2003); (COLLINS, H. M. et al., *Social Studies of Science* , 2003).

CONSTRUCTION OF A GRID OF LECTURE

The first step of this chapter, is a reflection on the different meanings of the expression “origin of AIDS”, which could highlight its complexity and introduce the grid of lecture of the topic (section 1).

The scientific discourses about the origin of AIDS usually adopt the form of theories or hypotheses, which are constructed in a almost narrative way: they are constructed around an idea and mainly develop following a principle of coherence. It is then shown that these different hypotheses are incomparable among them, not only because of the semantic pluralism of the expression “origin of AIDS”, but also because they do not accept the same background knowledge (section 2).

The different ways in which some authors have approached the problem of categorizing the theories or hypotheses about the origin of AIDS are considered in section 3.

The central result will be the proposal of a grid of lecture of the topic, which could allow to deconstruct each hypothesis in its components making them comparable to other proposals (section 4).

However this new grid of lecture doesn't make the topic fully separable in subfields, because in different ways all the hypotheses try to answer to the question of the origin of AIDS. Nonetheless, four subfields can be identified inside the topic of the origin of AIDS: the cause of the syndrome, the source of HIV, the provenance of the AIDS epidemics⁵⁵ and the determinants of the AIDS epidemics. These subfields belong to different disciplinary contexts: 1) etiology, 2) virology and molecular biology, 3) epidemiology, 4) medical geography and medical anthropology.

The last section is then dedicated to the perception of a human responsibility in the origin of AIDS and an intuitive scale of it is proposed.

⁵⁵ The term is used in the plural form because, as explained in the section on the source of HIV, the scientific mainstream accepts that different viruses of the HIV family provoke independent epidemics. The main epidemic, provoked by HIV-1 Group M, is normally indicated with the expression “AIDS pandemic”.

The object of the research

The central concept of this work is “origin of AIDS”, which can be interpreted in many ways. The variability of interpretations depends on the different meanings that both the terms “origin” and “AIDS” can have. For example, with the term "AIDS" three concepts can be intended: the pathogenic state, the virus infection or the epidemic; on the other hand, the term "origin" can be interpreted as the provenance, the source or the causes of a given thing.

This variability has led to some confusion while using and interpreting the concept in the literature, and that is one of the reasons which make interesting a clear analysis of all the different possibilities included in the expression "origin of AIDS".

The aim of the following chapter is to explain what is meant with the expression “origin of AIDS”, and to highlight the fact that several different interpretations are possible.

To understand the different interpretations of the concept, it is useful to decompose the expression and define separately both “AIDS” and “origin”.

What is AIDS? AIDS was born as the acronym for Acquired Immunodeficiency Syndrome or Acquired Immune Deficiency Syndrome, and was intended to mean «*a breakdown of the immune system that renders individuals vulnerable to a variety of serious opportunistic diseases*»⁵⁶. The exact date of its first use is not known exactly, but it can be situated in the summer of 1982. Mirko Grmek, author of the classic book *Histoire du SIDA*, says so in his book⁵⁷. Randy Shilts, author of a catchy chronicle of the first years of the US epidemic, specifies a bit more saying that the term "AIDS" was coined during a meeting of the Centers of Diseases Control and FDA on July, the 27th, 1982⁵⁸. In the scientific journal *Science*, the word appeared already in the edition of August, the 13th, 1982⁵⁹. The clinical definition of AIDS was corrected different times⁶⁰, but the main evolution was the inclusion in the definition of the presence of HIV⁶¹ antibodies in the blood of the patient, as necessary for the diagnosis of AIDS. This shift in the definition was at the origin of the semantic pluralism of the term "AIDS", which at the same time makes reference to an infectious disease provoked by a retrovirus, and to the clinical observation of a severe, and often fatal immunodeficiency⁶². To avoid this confusion, the latter is nowadays often referred by using the

⁵⁶ Melloni's Illustrated Medical Dictionary, second edition, 1985, Williams & Wilkins, 1985

⁵⁷ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989) see p. 69

⁵⁸ (SHILTS, R., "And the Band Played on : Politics, People, and the Aids Epidemic.", 1987), see p. 171

⁵⁹ (MARX, J. L., *Science*, 1982)

⁶⁰ (Anon., *MMWR Morb Mortal Wkly Rep*, 1985); (Anon., *MMWR Morb Mortal Wkly Rep*, 1987); (Anon., *MMWR Recomm Rep*, 1992)

⁶¹ Acronym of Human Immunodeficiency Virus. The name of the virus was established only in the second half of the Eighties, at the end of a long controversy between a French proposal (LAV) and an American one (HTLV-III). For more details see (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989)

⁶² (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989)

combined acronym "HIV/AIDS". But this new expression is not always used, probably because it's more complicated, longer or because its general adoption would then require to change the name of old institutions (i.e. UNAIDS). Last but not least, it is important to note that "AIDS" often indicate *per synecdoche* the AIDS epidemic. At this point we can see that three different concepts can be included under the term "AIDS": the pathogenic state, the virus infection and the epidemic. As we will see, this distinction is essential to understand what is intended with "Origin of AIDS".

To analyze the term “origin”, we can start simply understanding that it is associated with the idea that “now there is something new that before there wasn’t”. In the case of AIDS, what is new?

Let’s decompose the different meanings of the term “origin”. In the *Oxford English dictionary* we can find the following synonyms of origin that could be used in the context of AIDS: beginning, start, commencement, origination, genesis, birth, dawning, dawn, emergence, creation, birthplace, cradle, source, cause, root(s), derivation, provenance, descent, ancestry. It is possible to isolate, at least, three different interesting interpretations in connection with “AIDS”: origin as the provenance, the source or the causes. Theoretically it is possible to construct a double entry table to check all possible combinations of the main meanings of both terms: “origin” and “AIDS” (see table 1). Each cell then contains a question that highlights a particular aspect of the expression “origin of AIDS”.

AIDS origin of	syndrome (AIDS)	disease (HIV)	epidemic (AIDS ep.)
provenance, inception	Where and when did the first cases of the syndrome manifested?	Where and when are the first traces of HIV found?	Where and when have the epidemics started?
source, ancestry		Where is HIV from?	
causes, determinants	Which are the causes of the syndrome?	Which are the reasons for having HIV in humans?	Which are the determinants of the AIDS epidemic?

Table 1 - Possible interpretations of the concept "origin of AIDS"

It is easy to find some examples to show the possible confusions due to the semantic ambivalence: «*Although the AIDS epidemic is certainly new (AIDS does not mimic any previously known pestilence), the data so far leave unanswered whether HIV-1 and HIV-2 are new*»⁶³; or in another extract:

"The AIDS pandemic is a new problem for humans, but it is unclear whether the human immunodeficiency virus (HIV) giving rise to AIDS is also new to humans. Either HIV has recently infected humans, in which case we have a new virus and a new disease, or HIV infected humans long ago (being mild and/or restricted in range until recently), in which case we have an old virus and a new disease. [...]"⁶⁴.

It could seem normal to think that all these different interpretations of “origin of AIDS” as described in table 1 could lead to different and independent domains of research. However all these discourses have been very often presented mixed together. On one hand, it is important to keep in mind that they are indeed different discourses; For instance in 2004 the virologist Preston Marx warned about «*confusion over the origin of the virus and the origin of the epidemics*» bringing arguments which indicated that «*viral cross-species transmission is in itself not the only requirement for the generation of epidemics, and that the ancestry of HIV should not be confused with the origins of AIDS*»⁶⁵ (here intended as the AIDS epidemic). On the other hand, a full separation of the topic is a useless and simplistic approach. For example, in 1984 the epidemiologist De Cock wrote that «*[a]ny suggested aetiology must explain the epidemiology and clinical manifestations of AIDS*»⁶⁶. Wolfe and colleagues, argued in the same way responding to the accusations of mixing the concepts posed to them by Marx:

«It is important to distinguish between causal explanations at different stages of emergence. Factors that influence the frequency of primary infections are often different from those that contribute to viral adaptation and spread. For example, it is possible that hunting provides a mechanism for primary SIV infections, but that normal contact between human beings is not sufficient to initiate subsequent spread. In addition, some phenomena, such as deforestation, can exert multiple effects: deforestation might increase the frequency of primary infections by facilitating hunting at the same time as increasing the probability of global spread by connecting rural and urban communities, and thereby decreasing the probability of local extinction. [...] It

⁶³ (KRAUSE, R. M., *Science*, 1992)

⁶⁴ (MINDELL, D. P. et al., *Syst Biol*, 1995)

⁶⁵ (MARX, P. A. et al., *Journal of Medical Primatology*, 2004); (APETREI, C. et al., *Front Biosci*, 2004); (APETREI, C. et al., *Lancet*, 2004)

⁶⁶ (DE COCK, K. M., *Br Med J (Clin Res Ed)*, 1984)

is also important to distinguish between the process of how a virus emerges and whether or not a new virus causes disease.»⁶⁷

Other calls for the need of an all-inclusive discourse was done by the medical sociologist Charles Hunt and by the medical geographer Mayer, who wrote: «*Although a biological understanding of HIV-1 is necessary, it is inadequate. The epidemic of HIV-1 seropositivity and AIDS in Africa must be understood socially, in its historically specific context, or not at all*»⁶⁸; «*The emergence and resurgence of infectious diseases is as much a matter of social, ecological and geographical change as it is of smaller scale molecular or microbiological phenomena*»⁶⁹.

The hypotheses and their incomparability

The majority of the discourses on the origin of AIDS are presented under the form of alternative “theories” or “hypotheses”, which have been developed as general consistent narratives based often on limited observations.

The objective of this section is to show that these hypotheses are mostly incomparable among them, mainly because they represent an answer to different questions, but also because their authors accept different packages of knowledge.

To illustrate this incomparability, six examples of hypotheses on the origin of AIDS are given. Each hypothesis is referred to by the name of one of its supporters:

1) The Duesberg hypothesis: «*we propose that AIDS is a collection of chemical epidemics, caused by recreational drugs, anti-HIV drugs, and malnutrition. According to this hypothesis AIDS is not contagious, not immunogenic, not treatable by vaccines or antiviral drugs, and HIV is just a passenger virus*»⁷⁰;

2) The Hahn hypothesis: «*In summary, we subscribe to the hypothesis that direct human contact with infected chimpanzee and sooty mangabey blood resulted in zoonotic transmission of SIVcpz and SIVsm to humans, and that particular social, economic, and behavioral changes that occurred in the early and mid-20th century provided the circumstances whereby these viruses could expand and reach epidemic proportions*»⁷¹;

⁶⁷ (WOLFE, N. D. et al., *Lancet*, 2004)

⁶⁸ (HUNT, C. W., *Journal of Health and Social Behavior*, 1989), see pp. 367-8

⁶⁹ (MAYER, J. D., *Social Science & Medicine*, 2000)

⁷⁰ (DUESBERG, P. et al., *J Biosci*, 2003)

⁷¹ (HAHN, B. H. et al., *Science*, 2000)

3) The Montagnier hypothesis: «Another theory on the origin of HIV is based on the knowledge that many host species have lentiviruses that have evolved with them and which sometimes may not cause disease in their hosts. This theory postulates that HIV has recently evolved from a non-pathogenic human ancestor lentivirus which would have had to be sufficiently different not to induce antibodies reactive in standard HIV tests or to have been confined until recently to small remote populations»⁷²;

4) The Peeters hypothesis: «Overall, the high number of HIV-1 subtypes cocirculating, the high intrasubtype diversity, and the high numbers of possible recombinant viruses as well as different unclassified strains observed in our study are all consistent with an old and mature epidemic in Central Africa, more particularly in the DRC, suggesting that this region is the epicenter for HIV-1 group M viruses. Recently computer analysis of various HIV-1 isolates dated the origin of HIV-1 group M viruses to between 1914 and 1941»⁷³;

5) The Gilks hypothesis: «Could primate retroviruses have been passed on to man or other monkeys as a result of experiments with primate malarial? An answer to this question could explain the origin of the AIDS epidemic»⁷⁴;

6) The Seale hypothesis: «It is entirely plausible that the AIDS epidemic was started in the United States deliberately, by a hostile power, in the mid-1970s. [...] The United States would then have been destroyed permanently, as a military power, without using nuclear weapons and without fighting a conventional war»⁷⁵.

One can note that, although each of the presented hypotheses answers in some way the question of the origin of AIDS, they are incomparable among them. Let's analyze their main points in some detail.

The Duesberg hypothesis is an example of the group of theories which considers AIDS a semantic creation. According to it, many different syndromes and pathologies are gathered together under the term AIDS, and thus it can not have a unique explanation. More than that, one of the causes of the syndrome could be, following Duesberg's proposition, the cures themselves against AIDS. In his

⁷² (MCCLURE, M. O. et al., *Bmj*, 1989)

⁷³ (VIDAL, N. et al., *J Virol*, 2000)

⁷⁴ (GILKS, C., *Nature*, 1991)

⁷⁵ (SEALE, J., *J R Soc Med*, 1988)

hypothesis a virus, HIV, is mentioned, but it plays, in his opinion, no relevant role in the etiology of these different pathologies called altogether AIDS. On the opposite side, the mainstream researchers believe that HIV is the cause of the syndrome, and in fact, theories 2) to 3) speak about the origin of a retrovirus and not of the syndrome. The main difference among the Hahn and Montagnier hypotheses lies in the origin of the HIV-1, the latter considering it an old human or human-adapted virus, the first considering it an African monkey virus newly acquired by humans.

The Gilks hypothesis in turn doesn't doubt that HIV is an evolution of a simian retrovirus, and focuses on a possible determinant which can explain the passage from monkeys to humans. In the Hahn hypothesis, some possible determinants are also mentioned, but not in a very specific way saying that: «*particular social, economic, and behavioral changes*» could explain the AIDS epidemic.

The Peeters hypothesis discusses mainly the topic of the provenance and the inception of the AIDS epidemic (in other words, when and where it started); while the Seale's hypothesis deals mainly with the idea of human responsibility, considering AIDS as a biological engineered weapon.

To summarize it can be said that these six hypotheses deal with five different contexts: the cause of the (clinically-observed) syndrome (the Duesberg hypothesis), the origin of HIV (the Hahn and Montagnier hypotheses), the place and the timing of the start of the epidemic (the Peeters hypothesis), the determinants of the epidemic (the Gilks hypothesis), and the human responsibility of the epidemic (the Seale hypothesis). In this sample of hypotheses, only two are in the same context, Hahn's and Montagnier's. Apart from the fact that these hypotheses follow different interpretations of the concept "origin of AIDS", two other non-independent reasons explain their incomparability:

- 1) They do not share common knowledge. For instance Hahn or Gilks do not doubt that HIV is the cause of AIDS, and focus their attention on the source of HIV and on the explanations for the passage of the virus from monkeys to humans;
- 2) Every hypothesis has a central starting point from which it is constructed, respecting the principle of coherence. Some examples are: the anthropological observation of a ritual of a particular population, which could be used to explain the transmission of the virus; the coincidence in time and space of the outbreak of the epidemic with a special phenomenon like the ability of developing biological weapons.

Given this phenomenon of incomparability, the difficult dialog between the partisans of different hypotheses is not surprising.

In the present section we have shown that the hypotheses are incomparable among them, but at the same time they all give an answer to the question of the origin of AIDS.

Reviews of the hypotheses on the origin of AIDS

Some authors have compiled reviews of the different hypotheses proposed on the origin of AIDS. In general these reviews tends to be “partial”, in the sense that the author chooses his own parameters or some scientific authority’s ones to evaluate the “plausibility” of the theories. This approach can be criticized from the point of view of the Bloor’s strong program, because of its lack of “symmetry” and “impartiality”⁷⁶.

In this section, after citing some examples of “partial” reviews, two “impartial” reviews are studied in particular (Grmek’s and Hooper’s) in order to analyze and discuss the way in which they classify the hypotheses. At the end of the analysis, the need for a new organization of the discourses on the origin of AIDS will be highlighted.

To illustrate the “partiality” of the majority of the reviews some examples are provided: the historian of medicine Mirko Grmek, for instance, divided in an article the hypotheses between *probable* and *improbable explanations*⁷⁷; the retrovirologist Myra McClure in one of her articles *«deals with the theories on the origin of HIV that are scientifically plausible»*⁷⁸; the separation between *accepted and refuted theories* is proposed by Myers in his article of 1993⁷⁹.

In Wikipedia there is a list of *AIDS conspiracy theories*⁸⁰; here, the use of the term conspiracy may have a pejorative connotation, and in fact, in the discussion pages of the “open source encyclopedia” objections were raised regarding the appropriateness of the title and also discussing which theories should or should not be included in the “conspiracy” group.

A last example of this classification is the one provided by the anthropologist Hutchinson, who in 2000 spoke of *controversial theories*, which can be considered those opposing a dominant or official position⁸¹.

All these subdivisions imply a degree of subjectivity or better to say, of “partiality” because the author chooses his own parameters or some scientific authority’s ones to evaluate the “plausibility” of the theories. This partiality is manifested in the fact that in these classifications some theories were even not considered, and a question that arises almost automatically is, were they not because the author was not informed of their existence or because they weren’t seen as scientifically acceptable or again because they were politically controversial? An example of this “no inclusion” question can be found in an article by Grmek, published in 1998, where he lists all the relevant

⁷⁶ (BLOOR, D., "Knowledge and Social Imagery.", 1976)

⁷⁷ (GRMEK, M. D., *J Hist Med Allied Sci* , 1995)

⁷⁸ (MCCLURE, M. O. et al., *Bmj* , 1989)

⁷⁹ (Myers, G. et al., edited by Stephen S. Morseill. ; 25 cm; xxiii, 317 p "Emerging Viruses.", 1993)

⁸⁰ http://en.wikipedia.org/wiki/AIDS_conspiracy_theories

⁸¹ (HUTCHINSON, J. F., *Annual review of anthropology* , 2001)

articles about the OPV/AIDS hypothesis in the bibliography, but does not discuss the hypothesis itself in the body of the article⁸².

With the evolution of the accepted knowledge and considering that with the time sometimes hypotheses are re-evaluated, these types of classifications tend to be no more exhaustive and it's then difficult to reconstruct the rules used for categorizing the hypotheses.

The first interesting classification of the hypotheses here discussed, the Grmek classification, is based on the enumeration proposed by this author of the five different historical situations in which a new disease can appear (not necessarily exclusive for AIDS)⁸³:

- 1) It existed before its description, but it escaped the medical attention because it couldn't be conceptualized as nosological entity (a new perception);
- 2) It existed before, but it could only be noticed after a qualitative or quantitative change of its manifestation (a new epidemic);
- 3) It didn't exist in a particular region of the planet to which it was introduced from another region (a new provenance and inception);
- 4) It didn't exist before in any human population, but it affected an animal population (a new root and source);
- 5) It is absolutely new, because its causal germ didn't exist before (a new biological agent);

This classification establishes somehow a gradient between the social perception of something new and the absolute biological *nouveauté*. If we consider the hypotheses described in the previous section under this classification, the Duesberg hypothesis falls into the first category, the Peeters hypothesis falls into the second, the Hahn into the second and the fourth, the Montagnier into the third, the Gilks into the fourth, and the Seale into the fifth. However, this classification has its major problem in the lack of independence of the categories. Let consider this scenario: an animal virus was transmitted to humans, but only after a long period it affected a large population, and only after

⁸² (GRMEK, M. D., *Periodicum Biologorum* , 1998)

⁸³ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989) see p. 186. A similar classification has been presented by (AMPEL, N. M., *Rev Infect Dis* , 1991) and retaken by (HAGGETT, P., *Transactions of the Institute of British Geographers* , 1992).

(i) The infection was present all along but was previously unrecognized.

(ii) Pathogens responsible for these new diseases existed in the past but in a less virulent form. Some event, such as a genetic mutation, then converted the organism to its virulent form.

(iii) A new epidemic arises from the introduction of a virulent organism into a non-immune population.

(iv) Environmental and behavioural changes provide a new environment in which the disease-causing organisms may flourish.

In the book "Emerging viruses", Morse proposed the same categories of Grmek, paying attention to the distinction between the first and the second to the fourth. (AAVV, 1993, *Emerging viruses*, xxiii, 317 p) Also Robert Gallo, the controversial AIDS researcher, in an article of 1988, reported the first 4 point (GALLO, R. C., *J Acquir Immune Defic Syndr* , 1988). Mayer, a health and medical geographer, highlighted that Morse (and so Grmek and Gallo) did not mention the changes in the human-environment relationship (MAYER, J. D., *Social Science & Medicine* , 2000).

centuries it affected the population of another continent. In this scenario, then, three types of novelty are present at different stages (categories 2 to 4), and there is a danger of confusion.

The other classification of the hypotheses presented in this work is the one proposed by the independent scientific writer Edward Hooper⁸⁴. He divides the theories in three groups: those that consider AIDS as an old syndrome/disease (like the Montagnier hypothesis), those that consider it a recent acquisition of the human race (like the Peeters hypothesis), and those that consider AIDS not existing, but only «*a chimera, a creation of semantics*» (the Duesberg hypothesis). The categories seems pretty independent: old, recent or not existing. But what does Hooper mean with his categories “old” and “recent”? It is not explicitly said in his text, but given the subcategories in which he divides the “recent” group: «*the heavenly, the malevolent human, and the unwitting human*» it can be deduced that he means more or less a century, because this is the period in which science and technology might have had a certain impact (medical experimentation, vaccinations, radioactivity, industrial products).

This latter division in subcategories is also interesting for the attention it gives to the human responsibility. In fact, it can be considered one of the possible ways of grouping the theories on the origin of AIDS, so that Hahn’s hypothesis is in the heavenly, Seale’s in the malevolent and Gilks’ in the unwitting human category. But the question of human responsibility plays in this work an important role and will be discussed in the final chapter.

The principal problem of the Hooper classification lays in its lack of specificity. Considering that most of the hypotheses fall in the category of “recent”, too many different explanations are proposed and the human responsibility distinction, as it will be shown, doesn’t offer a solid parameter of classification. Moreover there is also a problem of independence: a scenario, in which a virus was transmitted from an animal to humans many centuries ago, but which only recently have been spread in an epidemic level, can be considered both in the old and recent categories.

So, because of the lack of an impartial, unambiguous and specific classification of the numerous hypotheses on the origin of AIDS and the need for a map to locate and confront the different discourses, a grid of lecture of topic is then proposed.

Building a grid of lecture for the origin of AIDS

The type of organization that is proposed here is simply based on the possible interpretation of the expression “origin of AIDS”, as presented in the previous chapter. The goal consists in organizing the topic “origin of AIDS” in different sub-fields, but not to divide it.

⁸⁴ (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000) see p. 151-169

The new classification or grid of lecture proposed is illustrated in the table 2:

AIDS origin of	syndrome (AIDS)	disease (HIV)	epidemic (AIDS ep.)
provenance, inception	Where and when did the first cases of the syndrome manifested?	Where and when are the first traces of HIV found?	Where and when have the epidemics started?
source, ancestry	C₂	Where is HIV from?	C
causes, determinants	A Which are the causes of the syndrome?	B Which are the reasons for having HIV in humans?	D Which are the determinants of the AIDS epidemic?

Table 2 - Different subfields from the interpretation of the expression "origin of AIDS"

The different questions are organized in 4 blocks (A-D).

- A) The cause of the syndrome;
- B) The source of HIV;
- C) The provenance of AIDS epidemic, divided in C1 and C2;
- D) The determinants of the AIDS epidemic.

The block C) is divided in two: the answers to the questions posed in the block C2, constitute the data necessary to answer the question posed in the block C1. In the present work, only the block C1 will be analyzed, while the block C2 will be the subject of future researches.

Simplifying, one can observe that there are four contexts belonging to different fields of research: etiology (A), virology and molecular biology (B), epidemiology (C1 and C2), medical geography and medical anthropology (D).

The advantages of this classification lay on the identification of independent, impartial and specific contexts. However some hypotheses can answer at the same time to different questions. If, for example, we consider Duesberg's position, we can see that the cause of the syndrome coincides with the determinants of the AIDS epidemic, while for all the other hypotheses it is assumed that the question of the etiology (A) is simply solved by the isolation of HIV. This means that the

hypotheses are decomposed in the parts that give an answer to the different questions. In the next chapter the different answers are organized in different categories.

The perception of the human responsibility

The research on the origin of AIDS can be motivated by social and political reasons taking into account the variability of theories which consider a certain degree of human responsibility in the origin of AIDS. The interpretation of “origin of AIDS” as the “determinants of AIDS epidemic”, easily can be extended to the meaning of “responsibilities of AIDS epidemic”. Let consider this example, from an article of 1988 in the *Journal of the Royal Society of Medicine*:

«The opportunities for cross-species transfer of mammalian viruses have increased in recent decades. Relevant factors include rapid transport of people and animals, new techniques of animal husbandry, extensive use of live viral vaccines, deliberate infection of experimental animals, growth of viruses in cell cultures, search for biological weapons for war or pest control, and the new biotechnology. [...] It would appear that the AIDS epidemic may be just one of the latest of several mammalian cross-species viral transfers triggered by the techniques of virology developed in the 20th century, which subsequently spread out of control in the new host species.»⁸⁵

In a certain way, this citation is blaming modern medical technology in general. Another example comes from an article in 2004 of the *American Scientist*:

«The origin of HIV was not fundamentally natural, given that humans apparently failed to acquire an immunodeficiency virus from simians during thousands of years of exposure. Instead, the emergence of HIV involved social change in one form or another»⁸⁶

As the British venereologist, John Seale considered: «*the attitude that there is no importance in attempting to track down the origins of the AIDS epidemic will be held as highly irresponsible and unacceptable by the public*»⁸⁷. At the same time the eventuality of a human responsibility in the start and spread of the AIDS epidemic ads a certain mythological scent to the debate, recalling the Pandora Box or Prometheus myths. This can be seen in a citation of one of Grmek’s texts: «*the situation is a corollary of what Edward Tenner calls the revenge theory: 'Technological progress*

⁸⁵ (SEALE, J., *J R Soc Med* , 1988)

⁸⁶ (MOORE, J., *Am Sci* , 2004)

⁸⁷ (SEALE, J., *J R Soc Med* , 1989)

has changed our world, but the world seems bent on getting even, twisting our cleverness against us. ⁸⁸

For this reason it could be important to distinguish different levels of perception of the human responsibility in the origin of AIDS epidemics. I propose an intuitive scale in six points⁸⁹:

1) Absolutely no responsibility for humans: an external intervention, such as the action of a vindictive divinity, an extraterrestrial event such as a debris of a comet, volcanoes, etc.

2) No definable responsibility: new behaviors or social changes can be blamed, like demographic explosions, wars, migrations, scarcities, wild urbanization, sexual liberation, colonialism, etc. In the case of poliomyelitis, it seems that new epidemics of this disease were provoked in the Western countries essentially by the new hygienic measures adopted by the population (running water, new personal hygienic customs);

3) A definable responsibility, but unavoidable choice: for instance the introduction of a technical innovation, which has however collateral unforeseeable effects. Western medicine's innovations are examples, for instance the birth of new strains of bacteria as a consequence of the extensive use of antibiotics, the spread of diseases through vaccination campaigns or blood transfusions. The emergence of hepatitis C virus in the 20th century;

4) Foreseeable, but underestimated risk: the introduction of a new technical innovation, which has foreseeable collateral effects, but which are considered as improbable or insignificant compared to the advantages of the innovation and therefore ignored. The SV40 case is probably an example⁹⁰. Often here lays a whole series of ethical topics, as is the case, for instance, of genetic engineering or xenotransplants. Another example is the probable crossover of scrapie from sheep to cattle (as bovine spongiform encephalopathy [BSE]) via new mass feeding methods in commercial agriculture, and then of BSE to humans (as Creutzfeldt Jacobs Syndrome);

5) Deliberately covered risk: the responsibilities are a legal matter; the introduction of a technical innovation, collateral effects of which are known or could be known, but which are not taken into consideration because of the economical or political interests of a group of people. Examples are the continued use of asbestos or the pollution emitted by some industries.

6) Deliberate action. The responsibility is clearly criminal, like biological warfare.

In the case of AIDS, theories have been proposed which fit each of these categories of responsibility. Two extreme examples are the theory that proposes HIV to be of extra-terrestrial

⁸⁸ (GRMEK, M. D., *J Hist Med Allied Sci* , 1995)

⁸⁹ It is also interesting that this type of scale can be used in other situations, to consider for instance scientific error, from genuine mistake to intentional fraud. (WILKIE, T., *Lancet* , 1996); see also (Poglia, Greta. "La Fraude Dans La Recherche Biomédicale: Le Cas Des Articles Dupliqués." Th. méd. Genève, 2005.)

⁹⁰ (BOOKCHIN, D. et al., "The Virus and the Vaccine : The True Story of a Cancer-Causing Monkey Virus, Contaminated Polio Vaccine, and the Millions of Americans Exposed.", 2004)

origin⁹¹ and, at the opposite end, the theory which proposes that it is a product of biological warfare⁹².

The delimitation of these categories is not clean, and therefore a theory can lie between two or three of them. For example the OPVT can lay between the third, fourth and fifth categories. In any case it is important to highlight the human perception of differences among them, which implies that accusing traditional bushmeat consumption is seen as less blaming than accusing experimental polio vaccines. The risk of a blaming reaction is strong and it is easy to imagine how it can strongly influence the discussion. One can imagine that it is not in the interest of an organization, national health policy agency, or research group, to pursue investigations that can damage themselves. The example of the OPVT is clear, where the risk for the polio vaccines campaigns or the image of some renowned scientists were at stake. The actions that can be performed to block a research or the diffusion of an idea (suppression of dissent), can be passive (ignoring it) or active (for instance suing whoever publishes something about it)⁹³.

But the investigation about the origin of AIDS is essential to understand which human activities can be dangerous. As the scientific journalist Julian Cribb wrote:

«[...] we must improve the safety of biologics worldwide. The one clear finding from this issue so far-that primate tissues be banned for making vaccine-has yet to be adopted. [...] Acknowledging the possibility that AIDS is iatrogenic will compel a far more cautious approach to animal organ grafts and other trans-species experiments»⁹⁴.

For instance the strong relation between human and monkey viruses has been taken seriously by WHO, which required in 1985 the testing of vaccines and reagents produced in monkey kidney tissue cultures⁹⁵. Cecil Fox and Gerasmos Lecatsas, two virologists, were for instance concerned with OPVT because they were worried about the safety of modern polio vaccines⁹⁶.

But at the same time, such a research can be useful to stop dangerous, damaging and discriminatory misconceptions⁹⁷.

⁹¹ (MCCLURE, M. O. et al., *Bmj* , 1989); see also (HOYLE, F. et al., "Diseases From Space.", 1980) and (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000) see p. 152.

⁹² (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000) see pp. 153-6; See also (HOROWITZ, L. G., "Emerging Viruses: Aids and Ebola : Nature, Accident Or Intentional?", 1996)

⁹³ (MARTIN, B., *Nature* , 1993)

⁹⁴ (CRIBB, J., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

⁹⁵ (ZUCKERMAN, A. J., *Br Med J (Clin Res Ed)* , 1986b); (LYONS, S. F. et al., *S Afr Med J* , 1988). Different study have been conducted and published to certificate that polio vaccines are SIV- and HIV-free. The topic is even more hot in correlation with SV40, because the contamination of vaccine lots is proofed and accepted, as well as the negative effects of SV40 in human.

⁹⁶ (FOX, C. H., *Science* , 1992); (LECATSAS, G. et al., *S Afr Med J* , 1989); (LECATSAS, G. et al., *S Afr Med J* , 1990); (LECATSAS, G., *Nature* , 1991); (LECATSAS, G. et al., *Lancet* , 1992); (LECATSAS, G., *Nature* , 2000)

⁹⁷ cfr. Moore's homepage: <http://weber.ucsd.edu/~jmoore/publications/HIVorigin.html>

The political consequences or implications of some of the discourses constructed around the topic of the origins of AIDS are evident. Recently, an article written by some specialists in simian viruses warned about the *Risk to human health from a plethora of Simian Immunodeficiency Viruses in Primate Bushmeat*⁹⁸. On it, the authors blame directly the consumption of bushmeat as responsible for the AIDS epidemic, an affirmation with undeniable political consequences. Other researchers disagreed on this point, arguing that naturally transmitted viruses wouldn't be pathogenic in humans, because «most animal viruses fail to reach a sustained human-to-human transmission»⁹⁹. In their article, Marx and colleagues, affirmed that «[t]he somewhat shocking answer is that we actually know nothing about the factors that launch animal viruses into epidemics or pandemics». This particular controversy has political implications, in the sense that it can help to promote a banding of bushmeat consumption. This is in fact an example of the possible political impact of a research on the origin of AIDS.

⁹⁸ (PEETERS, M. et al., *Emerg Infect Dis* , 2002)

⁹⁹ (MARX, P. A. et al., *Journal of Medical Primatology* , 2004)

SUBFIELDS AND MACRO-CONTROVERSIES

At this point we can resume in a list the four categories composing the new classification proposed for the topic “origin of AIDS” in the previous chapter, which allows comparability among the different positions and theories (the capital letter used to indicate each category corresponds to those used in table 2). The main focuses of discussion of each category are roughly summarized in the questions following each title.

- A) The cause of the syndrome: Is AIDS provoked by HIV? How is it transmitted?
- B) The source of HIV: Where does HIV come from? Is HIV a Human or a Monkeys Virus?
- C) The provenance of the AIDS epidemic: Where and when did the epidemic start? Was it in Africa? Was it in the 20th century?
- D) The determinants of the AIDS epidemic: What are/have been the relevant determinants of the AIDS epidemic? Is AIDS a case of zoonosis?

The objective of the present chapter is to resume the principal answers given to the questions posed in the four subfields composing the topic “origin of AIDS”. The idea is to highlight what is considered to be the generally accepted knowledge and which are the still-open macro-controversies.

In this work, the term macro-controversy refers to the idea of opposed but commensurable positions about a general question. It is used in contraposition to the term micro-controversy, which makes reference to a controversy about a detailed aspect. While the micro-controversies are usually internal to a discipline, the macro-controversies can find their arguments in different disciplines.

The result of this chapter is a map of the topic “origin of AIDS” (see figure 1 in the next chapter), which can be used both to contextualize the present controversies and to easily situate any new additional discourse on the origin of AIDS that can appear.

The cause of the syndrome

The explanation of what provokes a syndrome, intended as a set of symptoms, can be named 'etiology'. In our case, what provokes AIDS? When immunocompromised young men were noted for the first time at the beginning of the eighties, this was the logical question to ask. Different things were suggested as possible answers: the use of a new recreational drug, an exaggerated exposure to semen, a new pathogenic agent, an old but modified pathogenic agent, or a combination of some of these explanations¹⁰⁰.

Already at the beginning of 1983, the team of Luc Montagnier claimed to have identified a new virus which could be a possible causing agent of the syndrome. This virus was at the center of a long and internationally extended controversy about the paternity of its identification between the French team and the laboratory of NCI, from the United States, directed by Robert Gallo.¹⁰¹

For a long time the virus was called with different names or simply the AIDS virus. A definitive name was assigned to it only in 1986: HIV, the Human Immunodeficiency Virus.

But is HIV the responsible of AIDS? The most accepted answer is "yes", but there is still a movement of people which rejects this explanation. According to Wikipedia: «*The AIDS reappraisal movement (or AIDS dissident movement) is a loosely-connected group of activists, journalists, citizens, scientists, researchers, and doctors who deny, challenge, or question, in various ways, the prevailing scientific consensus that the human immunodeficiency virus (HIV) is the cause of acquired immune deficiency syndrome (AIDS)*»¹⁰². The kind of critics that this group formulates to the "prevailing scientific consensus" range from the weak version, which considers that it hasn't been proved that HIV cause AIDS, to the strong which declares that HIV simply does not exist, passing by a middle-term one which postulates that HIV exists, but it is a harmless retrovirus.

From the *AIDS reappraisal movement* point of view, as the question of the etiology of AIDS is not still resolved, doubts can be raised about the infectiousness of AIDS. For some of these groups, for instance, AIDS is provoked by the antiretroviral medicaments, which are used to prevent the development of AIDS. This movement, with Peter Duesberg¹⁰³ as his most popular supporter, has

¹⁰⁰ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989) see p. 42-44; 90-91.

¹⁰¹ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989); (MONTAGNIER, L., "Des Virus Et Des Hommes.", 1994); (CREWDSON, J., "Science Fictions : A Scientific Mystery, a Massive Coverup, and the Dark Legacy of Robert Gallo.", 2002)

¹⁰² http://en.wikipedia.org/wiki/AIDS_reappraisal, status the 11/11/2005

¹⁰³ <http://www.Duesberg.com>

been involved in a huge controversy in the scientific world and in the mass media, manifestly manipulated on both sides by social, economical, ideological and political interests¹⁰⁴.

At least three Science and Technology Studies (STS) professionals have deeply analyzed the topic of the acceptance of HIV. The first of them, Steven Epstein, discusses «*the origin of AIDS, showing how HIV came to be accepted as the cause of AIDS and how that theory was challenged by some renowned scientists*»¹⁰⁵. The second author is Massimiliano Bucchi¹⁰⁶, an Italian professor, who seems to be sympathetic with Duesberg position, maybe abusing of the symmetric approach of the “strong program” of Bloor¹⁰⁷. The last one, Joan Fujimura, wrote two articles on «*the different styles of practice deployed by opponents in a current controversy surrounding the etiology of AIDS to understand how the same data are interpreted in different ways to support diametrically opposed views*»¹⁰⁸.

This controversy raged for many years and it is not closed yet, and one evident reason lays on the political implications of the dissidents’ opinions. In the words of Grmek: «*His [Duesberg's] scientific jousting might be amusing if the stakes were not so high and the practical consequences not so serious. It should not be forgotten that one of the corollaries of the Duesberg hypothesis is that AIDS cannot be transmitted by either homosexual or bisexual activity*»¹⁰⁹. The choice between right to free speech and health policy is a very interesting subject for philosophers of law. The titles of some articles devoted to this topic are paradigmatic in this sense: *The peril of pseudoscience*¹¹⁰; *If free speech costs lives that's a high price to pay*¹¹¹.

In 2000, in clear opposition to Duesberg and his new supporter, the South African President Mbeki, 5'000 international researchers signed the famous *Durban declaration*¹¹², trying to put an end to the questioning of the role of HIV as the causing agent of AIDS.

It is interesting to consider some aspects in relation with this controversy: it is a long lasting controversy and one in which not only lay people, critical at the modern medicine, are involved, but

¹⁰⁴ (DUESBERG, P. H., *Science*, 1995) TROVA (Cohen, 1994; altri, 1995) (DIETRICH, U. et al., "Inventing the Aids Virus.", 1997; DUESBERG, P. et al., "Inventing the Aids Epidemic.", 1994); (BROXMEYER, L., *Med Hypotheses*, 2003); (Anon., *Nature*, 2000)

¹⁰⁵ Written in an editorial of the hardcover edition (EPSTEIN, S., "Impure Science : Aids, Activism, and the Politics of Knowledge.", 1996) It's interesting to see how the author of the editorial used the term “origin of AIDS” meaning AIDS as the syndrome, so referring to the etiology. The work on which this book is based won the American Sociological Association's award for best dissertation of the year.

¹⁰⁶ (BUCCHI, M., "La Scienza Imbavagliata : Eresia E Censura Nel Caso Aids.", 1998). His book “The gagged science” has not been translated in English.

http://www.liminaedizioni.it/griglia_libro.cfm?art_codice=10&codice_collana=2.

¹⁰⁷ BLOOR. Martin on influence of symmetry on the controversy.

¹⁰⁸ (FUJIMURA, J. H. et al., *Soc Sci Med*, 1994); (FUJIMURA, J. H., *Techniques & Culture*, 1995)

¹⁰⁹ (GRMEK, M. D., *J Hist Med Allied Sci*, 1995)

¹¹⁰ (MAKGOBA, M. W., *Science*, 2000)

¹¹¹ (WAIN-HOBSON, S. et al., *Nature*, 2000)

¹¹² (Anon., *Nature*, 2000)

also very qualified experts in chemistry, biology, and medical research¹¹³; it's interesting to see how the books of STS professionals can actively contribute to inform, to form opinion, to criticize the 'orthodox' position; it's remarkable how difficult it is to separate the etiology of the syndrome from the determinants of the epidemic.

Other controversies linked to the etiology are those related to the transmissibility of HIV. It's shocking to listen that often the medical staff of many hospitals in the eighties refused to cure AIDS patients¹¹⁴. Even if shocking, this conduct can be humanly comprehensible, considering that the mechanisms of transmission of the fatal syndrome were not known by that time.

The controversy about the transmissibility of the AIDS agent through kisses or bites was discussed mostly on the lay press. This question is more interesting because it has an implication in the prevention campaigns. Scientifically, the presence of HIV in the saliva was considered demonstrated¹¹⁵, but very few cases could be attributed to this mechanism of transmission¹¹⁶. Can then deep kisses or bites be considered a risky behavior? The associations for the prevention of AIDS in Switzerland, for instance, refused to consider the above-mentioned behaviors as dangerous¹¹⁷. This choice implies a sort of "lie" or simplification, but at the same time, to insist in the consideration of a low or extremely low possibility of transmission, would surely have a psychological impact on the population and on the life of the seropositive people.

The discussion about transmission through insects settled more easily¹¹⁸, but it's interesting to see how the authors of articles on the topic have the tendency to express some prudence¹¹⁹.

The source of HIV

Once it was generally accepted the idea that AIDS was provoked by HIV (see Duesberg controversy in the previous section), to look for the origin of AIDS became equivalent to look for the origin of HIV. The newly discovered family of Primate Immunodeficiency Viruses (PIV), which includes the Human and the Simian Immunodeficiency Viruses (HIVs and SIVs respectively), is probably one of the most studied families of virus. A specific journal exists on

¹¹³ Examples are: Peter Duesberg, professor of molecular and cell biology at the University of California; Karl Mullis, Nobel prize for Chemistry in 1993, Eleni Papadopulos-Eleopoulos is a medical physicist based at Royal Perth Hospital in Australia; Robert Root-Bernstein, professor of Physiology at Michigan State University.

¹¹⁴ Personal Communication with nurses of Swiss hospitals.

¹¹⁵ (ROTHENBERG, R. B. et al., *AIDS*, 1998)

¹¹⁶ (VIDMAR, L. et al., *Lancet*, 1996); (Anon., *MMWR Morb Mortal Wkly Rep*, 1997) see also (Anon., *JAMA*, 1997)

¹¹⁷ At the moment AIDS prevention associations don't consider anymore vaginal liquids as infective. Cunnilingus is no more considered at risk, and as well fellatio, if there is no contact of ejaculation in the mouth.

¹¹⁸ (ZUCKERMAN, A. J., *Br Med J (Clin Res Ed)*, 1986a); (LYONS, S. F. et al., *Lancet*, 1986); (HRDY, D. B., *Rev Infect Dis*, 1987)

¹¹⁹ (BOOTH, W., *Science*, 1987); (SIEMENS, D. F. J., *Science*, 1987)

AIDS and retroviruses (*AIDS Research and Human Retroviruses*) and an enormous amount of articles in journals of virology and molecular biology deals with PIVs.

For the supporters of a viral origin of AIDS, the question became evident: where does the AIDS agent come from? The following points resume the main categories of answers:

- 1) HIV is an old human virus which was either relegated to an isolated tribe or already spread but not yet pathogenic;
- 2) Human Immunodeficiency Viruses are monkey viruses or the product of recent evolution of monkey viruses;
- 3) HIV has been newly acquired by humans, but not from monkeys.

The third point was very popular until the mid-eighties. Some of the possible “non-simian” explanations were: the AIDS agent is a variant of the African Swine Fever Virus¹²⁰, a recombination of the visna virus with another virus¹²¹, or a recombination of other two viruses¹²². For explaining the last possibility, several scenarios were proposed: a natural mutation, a mutation boosted by radioactivity, or even the deliberate intervention of men¹²³. There was even a famous astronomer who proposed that HIV fell on earth as a part of comet debris¹²⁴.

From the mid-eighties onwards the controversy concentrated on the first two points listed above, although outside the scientific world, the popular press at that time, later internet, published a lot of speculations about a possible human engineered origin of HIV.

Between the mid-eighties and the mid-nineties there was an explosion of phylogenetic studies. The possibilities offered by the newly developed Polymerase Chain Reaction (PCR) allowed to sequence and confront the genetic structure of the different primate immunodeficiency viruses. In the United States a project was created at research center Los Alamos National Laboratory, supported by the Division of AIDS of the National Institute of Allergy and Infectious Diseases (NIAID), to collect the different sequences and to develop tools to analyze them¹²⁵.

Nowadays it is considered that two families of the Human Immunodeficiency Viruses exist, HIV-1 and HIV-2, which are in turn subdivided in groups. HIV-1 Group M represents the family of virus responsible of 99% of the AIDS cases in the world. The group is subsequently divided in subtypes, listed with letters from A to K. For example the dominating strain in the West Countries is the HIV-1 Group M Subtype B. HIV-2 and HIV-1 Group N and O are considered to be

¹²⁰ (TEAS, J., *Lancet*, 1983); (TEAS, J., *Annals of the New York Academy of Sciences*, 1984); (BELDEKAS, J. et al., *Lancet*, 1986) see opposition by (FEORINO, P. et al., *Lancet*, 1986)

¹²¹ (LEWIN, P. K., *Can Med Assoc J*, 1985); (STRECKER, R. B., *J R Soc Med*, 1986)

¹²² (TOH, H. et al., *Nature*, 1985)

¹²³ (SEALE, J., *J R Soc Med*, 1988)

¹²⁴ (HOYLE, F. et al., "Diseases From Space.", 1980); (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000) see p. 152.

¹²⁵ <http://hiv-web.lanl.gov/>

independent epidemics (that is the reason why sometimes the plural “epidemics” is used). A virus belonging to the family of HIV has been identified in almost every species of African monkeys; they are now called Simian Immunodeficiency Viruses (SIV) even if, apparently, the African monkeys don’t fall sick with the virus.

It became a matter of conventional wisdom the idea that HIV, or a progenitor of HIV, only recently came to infect humans, coming from one or more nonhuman primates¹²⁶. However until 1995, some authors continued to support the idea that HIV was an old human virus, suggesting that certain rural African populations may have been infected with an immunodeficiency virus for many decades, centuries, or even millennia¹²⁷. The use of phylogenetic analyses to infer the direction of the infection between humans and monkeys has been sometimes criticized¹²⁸.

Another important element in the discussion about the direction of the infection has been the consideration of the virulence of HIV and SIV in humans and in monkeys. HIV is considered to be extremely virulent in humans, which is not the case for SIV in African primates. Asian primates are not natural carriers of SIV and react to it in a way that is similar to the manner in which humans reacts to HIV. The virulence in humans and Asian primates could be indicating us that they both have been infected by African monkeys. But Mindell, in 1995 asked for prudence in the use of this argument as a way to choose the second over the first category of answers to the question of the source of HIV¹²⁹.

Once that the paradigm of the passage from SIV to HIV was accepted, the attention moved into the identification of the species of monkeys which could be considered the reservoirs of the viruses ancestors of the HIV-1 and HIV-2. Sooty Mangabeys (carriers of SIVsm) were proposed for HIV-2, while chimpanzees (carriers of SIVcpz) were proposed for HIV-1, but with some reserves.

Mindell and his colleagues remarked how the names of the viruses could be inappropriate depending on the context:

«The names used for primate immunodeficiency virus taxa have been based on the host species in which the viruses have been found. [...] the association by name of HIV-1s and HIV-2s suggests (to systematists) a common origin for them to the exclusion of other

¹²⁶ (DIETRICH, U. et al., *Annals of Internal Medicine* , 1989); (DOOLITTLE, R. F., *Nature* , 1989); (ALLAN, J. S. et al., *J Virol* , 1991); (FOX, C. H., *Science* , 1992); (MYERS, G. et al., *AIDS Research and Human Retroviruses* , 1992); (Myers, G. et al., edited by Stephen S. Morseill. ; 25 cm; xxiii, 317 p "Emerging Viruses.", 1993); (Myers, G. et al., Used Price: \$159.95Hardcover "Evolutionary Biology of Viruses.", 1994)

¹²⁷ (DE COCK, K. M., *Br Med J (Clin Res Ed)* , 1984); (MONTAGNIER, L., *Annals of Internal Medicine* , 1985); (MONTAGNIER, L., *J Acquir Immune Defic Syndr* , 1988); (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989); (MCCLURE, M. O., *New Scientist* , 1990) and (EWALD, P. W., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 1994); (GRMEK, M. D., *J Hist Med Allied Sci* , 1995)

¹²⁸ (HIRSCH, V. M. et al., *Nature* , 1989)

¹²⁹ (MINDELL, D. P. et al., *Syst Biol* , 1995)

immunodeficiency viruses, but (as discussed above) this appears not to be the case. Similarly, the taxon SIV gives the unsupported impression that all SIVs are more closely related to each other than they are to various HIVs».

The question of the origin of HIV was a driving force for a lot of research in the fields of primatology, virology and molecular biology. In future studies it will be interesting to analyze more in detail three sub-topics of the molecular biology field:

- 1) The subtypes of HIV-1 Group M and the question of their recombination;
- 2) The parallel epidemics of HIV-2, HIV-1 Group N or O;
- 3) The relation SIV/HIV – in particular HIV-1/SIVcpz and HIV-2/SIVsm.

The provenance of AIDS epidemic

Considering AIDS as the AIDS epidemic, the question about its origin is: «*when and where did the epidemic of AIDS begin?*»¹³⁰.

This aspect can probably be considered as a question for medical geography and, in fact, many geographers have analyzed the spatial and ecological patterns and issues related to HIV/AIDS¹³¹.

In this section we will talk mainly about the AIDS epidemic caused by the virus HIV-1 group M (the AIDS pandemic), because the controversies about where and when are concentrated on it.

To answer to the “where and when question”, which corresponds to the category C1 in table 3, it would be important to answer the questions of the block C2 in the first place, which means to study the first cases of AIDS recorded (also retrospectively if possible) and the first traces of HIV in human blood (also retrospectively if possible). But, an analysis of these arguments will be conducted in future researches, while the present work focuses instead on the analysis of the answers given to the question C1: where and when the AIDS pandemic started?

The different hypotheses, proposed to answer this question, articulate different elements related to time and place. For our need of comparability, I will decompose these hypotheses in its comparable elements and then group together the principal answers, listing in the first place those given to the “where question” and in the second place those responding to the “when question”.

Another reason for this separation among the where/when elements of the hypotheses lies upon the fact that some hypotheses consider only one of the two elements. That is especially true for the case

¹³⁰ (HAGGETT, P., *Transactions of the Institute of British Geographers*, 1992).

¹³¹ (SHANNON, G. W. et al., *Annals of the Association of American Geographers*, 1989); (SHANNON, G. W. et al., "The Geography of Aids.", 1990); (GOULD, P., "The Slow Plague : A Geography of the Aids Pandemic.", 1993); (GOULD, P., *Professional Geographer*, 1989); (MAYER, J. D., *Social Science & Medicine*, 2000); (CLIFF, A. D. et al., *Geographical Journal*, 1992); (LARSON, A., *African Affairs*, 1990); (WOOD, W. B., *Professional Geographer*, 1988).

of the “when question”, for the answer of which special tools have been developed, based on phylogenetic analyses and molecular clock estimations.

Where?

In discussing the “where question” it has been difficult to escape from certain political constraints, certainly because of the big impact of the possible answers. The following citation is very representative of this phenomenon:

“There has been keen interest in mapping the routes of HIV infection since the pandemic was first discovered. We have seen years of acrimonious debate about where the virus came from, and about who was responsible for its spread. Mercifully, the public health community has all but abandoned this useless discussion. Once we knew that HIV did not behave like the plague or like cholera, that it could not be contained through quarantine and isolation, public health officials started to lose interest in the fanciful maps with the swooping arrows. But the discussion has not disappeared. Governments, the news media, and the public in general are still keenly interested to find out who is carrying HIV where. Immigration officials still perk up when AIDS is mentioned, ready to slap on another travel restriction or another regulation for mandatory HIV testing.”¹³²

The controversies that developed around the “where question” have one of their main driving forces in the blaming mechanism: the will to find an external responsible, a scapegoat. The desire to see serious disease as coming from somewhere else, as an invasion, as a foreigner, is a widespread phenomenon, as Susan Sontag wrote in her books *Illness as metaphor* and *AIDS and its metaphors*¹³³.

The AIDS epidemic was first noticed in United States at the very beginning of the eighties. But it was soon evident that it wasn't something limited to North America. The relevant amount of immunocompromised Haitian emigrants in the United States re-oriented the suspicions to the Caribbean island¹³⁴. In Europe, most of the cases were connected to the United States, Haiti or Sub-Saharan Africa (in particular to the region of ex-Belgian Congo). The characteristics of having a high percentage of seropositivity and an equal distribution between the sexes, present both in Haiti and Africa, together with the evidence of early traces of HIV represented by a few blood samples

¹³² (DECOSAS, J. et al., *Lancet*, 1995)

¹³³ (SONTAG, S., "Illness as Metaphor.", 1978); (SONTAG, S., "Aids and Its Metaphors.", 1989)

¹³⁴ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989); (FARMER, P., "Aids and Accusation : Haiti and the Geography of Blame.", 1992)

that resulted seropositive, pointed to an origin in Africa, with a transmission to Haiti in the first place, then to the United States and Europe and subsequently to the rest of the world¹³⁵.

At different stages, this interpretation was controversial at its time and it is still discussed by some people nowadays. From a spatial point of view, we can identify three consecutive controversies: The first one, which developed and settled on the early eighties, is about the localization of the epicenter of the epidemic: the United States or Africa?; the second one is about the direction of the infection between Haiti and the United States; the third and more recent one is about the exact location in Africa of the origin of the HIV-1 Group M's epidemic.

1) Africa vs. the United States

In the mid-eighties, few voices raised to claim that the African connection has not been proved.¹³⁶ Colebunders for instance, warned about the consequences of pointing to Africa, referring to the problems that arose in Haiti and for Haitian emigrants considered to be an AIDS risk group, when it was suggested that AIDS originated there.

In the life sciences, however, there was a general consensus about the African origin interpretation. One of the reasons more frequently invoked to explain why the syndrome was not identified before in this continent was the lack of diagnostic facilities there¹³⁷.

But outside the life sciences discipline, some authors still insisted in revising the notion of an African origin. The American medical sociologist Charles W. Hunt, for instance, wrote that: «*The Western press and (to some extent) the Western scientific establishment have attempted to locate the origins of the HIV-1 virus, [...] in Africa. In my opinion this attempt is based on a "victim-blaming" mentality and is fundamentally racist*»¹³⁸. And Hunt was not the only one, even Mirko Grmek, as late as in 1995, expressed his doubt: «*it is not known if the outbreaks on the two continents are independent and somehow parallel or if one ignited the other. Clinical descriptions and analysis of frozen sera have demonstrated the existence of sporadic cases of AIDS since the middle of the century, in both the United States and the Old World*»¹³⁹. It's important to mention, that, following the Duesberg's interpretation of AIDS, the problems of the epidemics in Africa and in the Western countries are different.

Some research areas played an important role in settling the controversy, virology in particular. The microbiological analysis which related HIV to SIV provided another argument in favor of the African connection, because only the African monkeys are naturally infected by SIV viruses. Researches in molecular biology also showed the presence in Sub-Saharan Africa of most of the

¹³⁵ (CLIFF, A. D. et al., *Geographical Journal*, 1992) citing (GALLO, R. C., *Scientific American*, 1987)

¹³⁶ (COLEBUNDERS, R. et al., *Br Med J (Clin Res Ed)*, 1984); (WENDLER, I. et al., *Br Med J (Clin Res Ed)*, 1986)

¹³⁷ (DESMYTER, J. et al., *Br Med J (Clin Res Ed)*, 1986)

¹³⁸ (HUNT, C. W., *Journal of Health and Social Behavior*, 1989); (HUNT, C. W., *Teaching Sociology*, 1990).

¹³⁹ (GRMEK, M. D., *J Hist Med Allied Sci*, 1995), see p. 263

HIV subtypes and recombinants. Moreover, at an epidemiological level, some studies showed a very high HIV prevalence in the early eighties in the population of some African countries.

2) United States vs. Haiti

As mentioned above, the more accepted pattern of spread is from Haiti to the United States. It is believed that HIV was taken out of Africa by professional Haitian employees who were working in the ex-Belgian Congo after the leave of the Belgian, who only after transmitted it to the United States. But many times doubts were expressed about the direction of the infection between Haiti and the United States. Some examples can be found in the citations below, written in 1984:

- «*It is more likely that AIDS was introduced to Haiti by holidaying American homosexuals*»¹⁴⁰;

- «*AIDS in the United States antedated that in Haiti, and the disease was probably introduced into the Haitian population by American homosexuals. It is suggested that the first Americans with AIDS acquired the condition in the early 1970s in Africa*»¹⁴¹;

- «*While numerical data are lacking, it is clear that several thousand professional people went from Haiti to Zaire between the early 1960s and the mid-1970s. Discussion with Haitians remaining in Zaire shows that most of these people have now left and live in Europe or North America. [...] We are unaware, therefore, of any facts implicating either central Africa or Haitian immigrants from central Africa as the origin of the disease, and such speculation must be viewed with skepticism unless substantive data appear*»¹⁴².

Different researchers who worked in Haiti actually defend the hypothesis that this country was infected by the United States¹⁴³. This is a topic for further researches, as it has not been fully investigated yet and it can be still of interest inside a discussion about the provenance of the AIDS epidemic.

3) Central vs. West African origin

The third controversy in this area raged about the exact origin of HIV-1 Group M. Hrды suggested Central Africa (East of Democratic Republic of the Congo, Rwanda, Uganda, Burundi), and that has remained for many years as the accepted epicenter¹⁴⁴. But in 1999, the powerful lobby constituted by the molecular biology laboratories of Beatrice Hahn (United States) and Paul Sharp (United Kingdom) started to locate the epidemic in West-Central Africa (Camerun-Gabon-Equatorial Guinea)¹⁴⁵, where HIV-1 Group N and O epidemics are also considered to have started.

¹⁴⁰ (COLEBUNDERS, R. et al., *Br Med J (Clin Res Ed)*, 1984)

¹⁴¹ (DE COCK, K. M., *Br Med J (Clin Res Ed)*, 1984)

¹⁴² (PIOT, P. et al., *Lancet*, 1984) see p. 68

¹⁴³ (PAPE, J. et al., *Clin Infect Dis*, 1993); (FARMER, P., "Aids and Accusation : Haiti and the Geography of Blame.", 1992). See also (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989)

¹⁴⁴ (HRDY, D. B., *Rev Infect Dis*, 1987)

¹⁴⁵ (GAO, F. et al., *Nature*, 1999); (HAHN, B. H. et al., *Science*, 2000)

In an interesting article by the anthropologist Moore written in 2000 we can read: "*Human Immunodeficiency Virus Type 1 (HIV-1) seems to have originated in at least three zoonotic transmissions of SIVcpz from chimpanzees (Pan troglodytes troglodytes) to humans, placing the origin of the disease in Central Africa (Cameroon, Gabon, R. P. Congo, lower Central African Republic, and Rio Muni [Equatorial Guinea])*"¹⁴⁶. The arguments used by both parts were important inside the Oral Polio Vaccine Theory (OPVT) controversy, because a Central African origin would coincide with the location of the Koprowski's vaccination. Hooper says clearly that Hahn and colleagues are intentionally promoting a new location for the epicenter with the aim of undermining OPVT¹⁴⁷. In any case, it is interesting to note how Hahn and colleagues, proposing a Central West African origin, had to admit an "*uncertain geographic coincidence between chimpanzee habitats and early AIDS cases*". Like the previous controversy, this topic deserves further research, too.

When?

When did the AIDS epidemic started? The question can be subdivided in two: When did the actual pandemic started? And, was it the first epidemic, or the virus has been affecting people in a not so notorious way before?

Some controversies arose while trying to answer these two questions.

1) Is it new or an old agent in human populations? Even if according to the most consolidated opinion the epidemic is a new phenomenon, many authors defended the idea of the virus being and old humans' acquaintance:

- The epidemiologist DeCock wrote in 1984: «*As the concept of genuinely new infectious organisms has no supporting evidence, the AIDS agent has presumably existed undetected*»¹⁴⁸.

- In the words of Colebunders: «*We agree that AIDS may not be a new disease, but the present outbreak of AIDS in equatorial Africa is certainly a new phenomenon*»¹⁴⁹.

- McClure says that: «*Whatever the origin of the AIDS viruses, it is likely that they have been around for at least a century (and perhaps longer in Central Africa), causing sporadic human infection*»¹⁵⁰.

- Seale: «*The precursor of the Aids virus could well have been enzootic in some indigenous animal species in Africa for millennia, like Lassa, Ebola, Marburg, simian herpes and rabies viruses, and occasionally infected a human by chance*»¹⁵¹.

¹⁴⁶ (CHITNIS, A. et al., *AIDS Research and Human Retroviruses* , 2000)

¹⁴⁷ (HOOPER, E., *Atti dei Convegni Lincei* , 2003)

¹⁴⁸ (DE COCK, K. M., *Br Med J (Clin Res Ed)* , 1984)

¹⁴⁹ (COLEBUNDERS, R. et al., *Br Med J (Clin Res Ed)* , 1984)

¹⁵⁰ (MCCLURE, M. O. et al., *Bmj* , 1989)

¹⁵¹ (SEALE, J. R. et al., *J R Soc Med* , 1987)

An interesting article published by Mindell and Ewald in 1995¹⁵² makes the point of the topic trying to define in the first place what does “new” means? These authors, to avoid ambiguity, considered «*a new virus one that has infected its host species within the past 50 years or so*». However, most of the time the term “recent” is used without a clear specification of the time considered, but the definition of “new” could be intended to include the whole 20th century. Mindell and Ewald consider that «*[a]lthough it is not possible to reject either hypothesis, we conclude that any consensus favoring the "new virus" hypothesis is not justified on the basis of current evidence and that the "old virus" hypothesis remains a viable alternative*». Grmek also speculated with the possibility that several mini-outbreaks could have happened before the actual pandemic, «*Perhaps for some centuries the virus existed throughout the world, scattered and manifest only at low level, in sporadic cases and mini-epidemics invisible to medicine before 1980. In the past, such a virus would have been less virulent and the routes for infection less wide open*»¹⁵³.

Despite all these voices, the general tendency nowadays is to consider the epidemic as something relatively new, so since the end of the nineties the main attention of the researchers focused on the question, how new? Or, in other words, did the epidemic develop before or after the Second World War?

Once again the arguments against or in favor of a precise timing have relevance for the OPVT hypothesis refutation. In this discussion, a central role is played by phylogenetic analyses, which constitutes an argument that deserves to be explored in future researches.

Defending the position that the AIDS epidemic began before the Second World War, there are several molecular biologists (the research groups of Hahn, Sharp and Korber¹⁵⁴) and anthropologists (Moore¹⁵⁵). It’s interesting to note how in defending this position, Hahn admitted, as did with the question of location, that «*[h]ow the AIDS epidemic actually began, what the contributing factors were, and why it appeared in the mid- to late 20th century (and not before) are not known*». The critics to this position can be expressed using the words of the journalist Cribb: «*Adherents of the monkey hunter theory have sought to distance it in place. Their recent work represents an attempt to distance it in time [...]. Both are based narrowly on the discipline of genetics, and lack balancing input from other branches of sciences*»¹⁵⁶.

¹⁵² (MINDELL, D. P. et al., *Syst Biol* , 1995)

¹⁵³ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989), see p. 155

¹⁵⁴ (HAHN, B. H. et al., *Science* , 2000); (GAO, F. et al., *Nature* , 1999); (KORBER, B. et al., *Science* , 2000); (SHARP, P. M. et al., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

¹⁵⁵ (CHITNIS, A. et al., *AIDS Research and Human Retroviruses* , 2000).

¹⁵⁶ (CRIBB, J., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* , 2001)

Defending the position that the epidemic started only after the Second World War, there were several authors as Marx¹⁵⁷, who pointed to the use of unsterilized syringes (which started to be widely used only after the conflict); a group led by Myers¹⁵⁸, who concluded that «*a recent non-Darwinian process took place coincident with the rise of AIDS in Africa*»; and clearly the supporters of the OPV/AIDS theory¹⁵⁹.

So, in the analysis of the answers given to the question “when” we can consider three periods of relevance: before 1900, and in 20th century both before and after the Second World War¹⁶⁰.

The determinants of the AIDS epidemic

This section deals with the interpretation of the expression “origin of AIDS” understood as the search for the determinants of the pandemic (block D) in table 3 and figure 1).

Here the “determinants” correspond to the main causes of the outbreak and spread of the epidemic. Ronald Barrett, a medical anthropologist working at the Stanford University characterized, in a popular article, the current phenomenon of EIDs as having three major trends: an unprecedented number of new diseases detected over the last 25 years; an increased incidence and prevalence of preexisting infectious diseases that were considered to be under better control; the appearance of antimicrobial-resistant pathogens.¹⁶¹

In 2004, Morens and his colleagues described the general determinants responsible for the emergence/re-emergence of infectious diseases in general.¹⁶² The authors considered that these factors were frequently different depending on whether the disease was 'newly emerging', 're-emerging/resurging' and 'deliberately emerging'. These factors can be of a genetic, biological, social and political nature: Microbial adaptation and change; Human susceptibility to infection; Climate and weather; Changing ecosystems; Human demographics and behavior; Economic development and land use; International travel and commerce; Technology and industry; Breakdown of public health measures; Poverty and social inequality; War and famine; Lack of political will; Intent to harm.

¹⁵⁷ (MARX, P. A. et al., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 2001)

¹⁵⁸ (BURR, T. et al., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 2001)

¹⁵⁹ (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000)

¹⁶⁰ This three positions have been described by Hillis in 2000 for Science (HILLIS, D. M., *Science*, 2000)

¹⁶¹ For Barrett and colleagues, these trends are occurring “within the broader context of an increasing globalization”, intended also as “the convergence of human disease ecologies”. (BARRETT, R. et al., *Annual review of anthropology*, 1998).

¹⁶² (MORENS, D. M. et al., *Nature*, 2004)

Some other determinants can be found in the articles of Grmek¹⁶³, who classified them in biological, environmental, social and cultural.

However, the general tendency is to look for explanations which are general or macroscopic and which do not put the blame on any particular or identifiable group of people.

In the context of the emerging infectious diseases, AIDS is surely fashionable and paradigmatic. We can read in *Nature*: «[a]ny discussion of recent EIs [Emerging Infections, n.a.] must begin with the human immunodeficiency virus (HIV) that causes AIDS»¹⁶⁴. Three reasons make AIDS to deserve a special attention in this context: it is the first new pandemic disease which challenged the trust of the people in the ability of the medical science to control new health threats; it is a problem with a huge magnitude in terms of number of deaths and social impact; it is a *nouveauté* in scientific terms (new conception of disease¹⁶⁵, new type of virus, etc.).

For the particular case of AIDS, those who accepted the paradigm of HIV being the product of the passage of a monkey virus to humans, considered numerous determinants, which can be grouped in three categories:

- 1) The key element is the passage from monkeys to humans;
- 2) The key element is a mixture of social, cultural and technological factors which, in the 20th century, allowed the large spread of the virus in the human population and thus the outbreak of the epidemic; In this mixture are included the events that allowed the adaptation of an SIV to humans;
- 3) The key determinant is a combination of the two precedent elements.

Some examples belonging to each category are presented below. It is interesting to note how there is a tendency among them to try to identify a unique and simple determinant:

- 1) The first category of determinants, the one that stresses the importance of the passage of the agent from monkeys to humans, focuses on explaining an increase in the contact with monkeys. Some of the more important factors enumerated are: the consumption bushmeat, especially of monkey meat, which can lead to the transmission of the agent through different parts of the process (i.e. bites, scratches during the hunt, consumption of uncooked or undercooked meat, etc.)¹⁶⁶; the activities of the traditional healers¹⁶⁷; the performance of sexual rituals with monkey blood¹⁶⁸; sexual deviancies, as zoophilic practices¹⁶⁹; increased search and use of monkeys for biomedical purpose¹⁷⁰;

¹⁶³ (GRMEK, M. D., *J Hist Med Allied Sci* , 1995); (GRMEK, M. D., *Periodicum Biologorum* , 1998)

¹⁶⁴ (MORENS, D. M. et al., *Nature* , 2004).

¹⁶⁵ (GRMEK, M. D., "Histoire Du Sida : Début Et Origine D'une Pandemie Actuelle.", 1989)

¹⁶⁶ (TEAS, J., *Lancet* , 1983); (HRDY, D. B., *Rev Infect Dis* , 1987); (HAHN, B. H. et al., *Science* , 2000)

¹⁶⁷ (MCCLURE, M. O. et al., *Bmj* , 1989)

¹⁶⁸ (NOIREAU, F., *Lancet* , 1987)

¹⁶⁹ (LEWIN, P. K., *Can Med Assoc J* , 1985)

¹⁷⁰ (GIUNTA, S. et al., *Nature* , 1987)

malaria experimentations with monkey blood¹⁷¹; the use of monkey kidneys for the production of poliovaccines¹⁷²; etc.

2) In the second category, two of the determinants more typically invoked are the rapid urbanization process and the sexual liberation which Africa underwent in 20th century. The following two citations illustrate this interpretation: «*With movement of people into the cities, due to economic change, perhaps there was an increase in sexual contacts*»¹⁷³; «*The extent to which rapid political, social, and cultural changes that have occurred in African society during this century could have played a part in the spread of HIV is impossible to specify, although some of the features of the AIDS epidemic -for example, its spread through prostitution- are certainly linked to rapid urbanization*»¹⁷⁴. Another kind of argument is the used by Bill Schneider, who investigated the documentation related to the blood transfusions in Africa during the 20th century, highlighting their possible connection with the start of AIDS epidemic¹⁷⁵.

A tense controversy actually arose around the specific importance of the different transmission patterns of the virus. Traditionally, it has been considered that sexual transmission was the most important source of contagion followed by the use of unsterile syringes, particularly common among heroin drug addicts¹⁷⁶. But, in the last five years, some researchers proposed that the role of sexual transmission had been overestimated, and that in fact, unsterile medical equipment was the real cause of the AIDS diffusion, particularly in Africa and developing countries: «*Accumulating evidence undermines the belief that heterosexual transmission in developing countries has as large - and that unsterile medical equipment has as little - a role as supposed by many HIV experts*»¹⁷⁷. The implications of such a controversy at a health policy level are evident, the impact on the prevention campaigns, huge, because it could imply that the sexual intercourses are not as dangerous as proposed. In any case, the WHO started to pay more attention on the importance of the usage of unsterile medical equipment in the transmission of the virus.¹⁷⁸

3) The third category was a combination of the two precedent. One of the authors defending this position is the anthropologist Moore who says: «*We suggest, however, that the origin of the disease may lie in the interaction between colonial practices (e.g., labor camps, non-sterile vaccination*

¹⁷¹ (GILKS, C., *Nature*, 1991); (GILKS, C., *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 2001)

¹⁷² (HOOPER, E., "The River : A Journey to the Source of Hiv and Aids.", 2000)

¹⁷³ (GALLO, R. C., *J Acquir Immune Defic Syndr*, 1988) see p. 523

¹⁷⁴ (MCCLURE, M. O. et al., *Bmj*, 1989)

¹⁷⁵ (SCHNEIDER, W. H. et al., *Am J Public Health*, 2006)

¹⁷⁶ Another way of transmission is from mother to infant at birth or through milking, but it is less relevant here.

¹⁷⁷ (GISSELQUIST, D. et al., *Bmj*, 2002); (GISSELQUIST, D. et al., *International Journal of STD and AIDS*, 2002);

(DRUCKER, E. et al., *Lancet*, 2001) see also (SEALE, J. R. et al., *J R Soc Med*, 1987)

¹⁷⁸ (DICKO, M. et al., *Bull World Health Organ*, 2000)

*campaigns) and traditional bushmeat hunting in French Equatorial Africa»*¹⁷⁹; another author is Rambaut (and colleagues), who speaks about the possibility of having had a natural transfer in a isolated tribe combined with a social change¹⁸⁰.

So in the last years an interesting controversy arose, opposing those who believe that the essential step, sufficient to explain the epidemic, is the contact with monkey blood, and those who believe that the explanation of this passage alone it's not enough to explain the epidemic, because the SIVs are not virulent in humans, so they need to adapt to the human body. In this discussion, a term frequently used is "zoonosis". What is zoonosis? According to the *Medical Dictionary Online*¹⁸¹ zoonosis can be defined as: «*The transmission of a disease from an animal or nonhuman species to humans. The natural reservoir is a nonhuman animal*». Actually *AIDS as a zoonosis*¹⁸², is the title of an article published in *Science* in 2000 by one of the groups opposing in the controversy. The other group, in turn, answer with an article entitled: *AIDS as a zoonosis? Confusion over the origin of the virus and the origin of the epidemics*¹⁸³ in which they expressed their disagreement with the application of this term to AIDS: «*The emphasis is on a zoonosis being a naturally acquired disease from an animal source. There is no evidence for AIDS being acquired directly from an animal source. [...] AIDS is not a zoonosis, but a human infectious disease of zoonotic origin*»¹⁸⁴. At this point one could ask, is it an important question, or is it simply a semantic dispute? It could be considered this way if one could forget all the political consequences of both interpretations. The title of an article published in 2002: *Risk to Human Health from a Plethora of Simian Immunodeficiency Viruses in Primate Bushmeat*¹⁸⁵ gives an idea of the possible impact of adopting one or the other position. The same author wrote in 2004:

«Use of non-invasive methods for the identification of the simian counterparts of these viruses could therefore serve as sentinels by signalling which pathogens might pose a risk for human beings. Subsequent early recognition of human infections will then allow rapid implementation of control measures to limit spread of these zoonoses. Alternatively, reducing contact between primates and human beings by limiting hunting of primates as bushmeat and providing alternative protein sources in these remote areas, as well as informing local populations about

¹⁷⁹ (CHITNIS, A. et al., *AIDS Research and Human Retroviruses* , 2000)

¹⁸⁰ (RAMBAUT, A. et al., *Nat Rev Genet* , 2004)

¹⁸¹ <http://cancerweb.ncl.ac.uk/cgi-bin/omd>

¹⁸² (HAHN, B. H. et al., *Science* , 2000)

¹⁸³ (MARX, P. A. et al., *Journal of Medical Primatology* , 2004)

¹⁸⁴ (MARX, P. A. et al., *Journal of Medical Primatology* , 2004), re-take also in (APETREI, C. et al., *Lancet* , 2004) and (APETREI, C. et al., *Front Biosci* , 2004) Another version of this theory appeared in *Medical Hypotheses* in 2001 (GRASSI, H. C. et al., *Med Hypotheses* , 2001)

¹⁸⁵ (PEETERS, M. et al., *Emerg Infect Dis* , 2002)

diseases that can be transmitted from primates to human beings, might also help to prevent cross-species transmissions.»¹⁸⁶

In another contemporary article, we can see an interesting synergy of the “zoonotic” position with animal protecting programs:

«Our results show simian retroviral zoonosis in people who have direct contact with fresh non-human primate bushmeat, and suggest that such zoonoses are more frequent, widespread, and contemporary than previously appreciated. The increased amount of hunting in central Africa that has resulted from a combination of urban demand for bushmeat and greater access to primate habitats provided by logging roads, has increased the frequency of human exposure to primate retroviruses and other disease-causing agents. In addition to helping conserve endangered species, the reduction of non-human primate hunting activities has the potential to reduce the frequency of cross-species transmission of simian retroviruses and other pathogens.»¹⁸⁷

It's interesting to note that Marx' group feared exactly the opposite consequence as a result of the consideration of AIDS as a zoonosis « *[it] may result in deliberate killing of monkeys to prevent the spread of AIDS, a disastrous consequence for endangered non-human primates (NHPs) that is likely to have little effect on the AIDS epidemic* »¹⁸⁸.

Another degree of misunderstanding can be added when the information coming from scientific sources is diffused through the general press. The following citation describes this phenomenon in relation to some researchers that pointed to chimpanzees as a source of HIV-1:

“Chimpanzee meat blamed for AIDS epidemic was the headline in a frontpage article in the New York Times. The first paragraph of the article stated that Chimpanzees slaughtered for food in west central Africa was the original source of AIDS. Another was from the Daily telegraph which stated that: AIDS started by humans eating chimps. The fact that the original scientific paper suggested that route of human infection with SIVcpz was exposure to blood during hunting and butchering and not the ingestion of meat is incidental to the bigger issue that research only identifies the source of the virus and not the mechanism by which AIDS emerged. The corrected headline would have been, Chimpanzees slaughtered for food in west central Africa was the original source of HIV”.¹⁸⁹

The subject of zoonosis should be analyzed in a more detailed way in future researches.

¹⁸⁶ (PEETERS, M., *Lancet*, 2004)

¹⁸⁷ (WOLFE, N. D. et al., *Lancet*, 2004)

¹⁸⁸ (MARX, P. A. et al., *Journal of Medical Primatology*, 2004)

¹⁸⁹ (MARX, P. A. et al., *Journal of Medical Primatology*, 2004)

Conclusions about the map of the topic

The figure 1 represents a resume of the subfields and the macro-controversies enumerated in the previous sections:

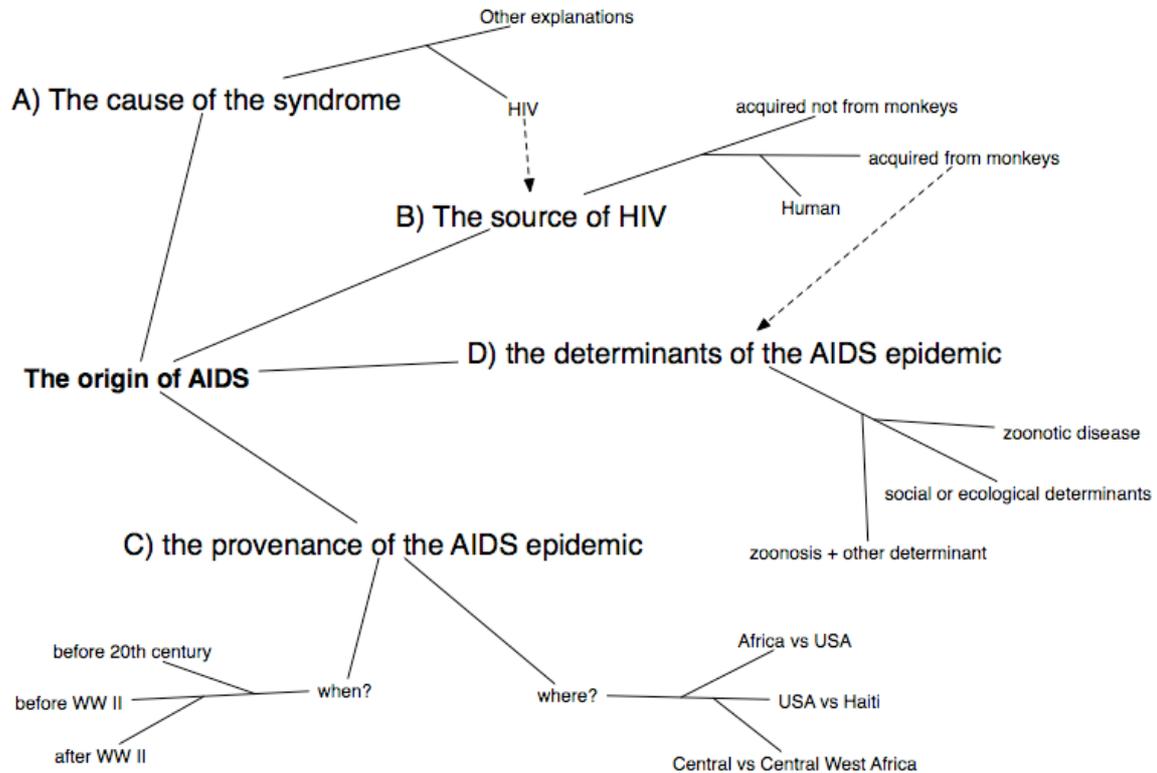


Figure 1 - Sub-fields and macro-controversies in the origin of AIDS

It is now possible to resume the main macro-controversies still open or not fully closed, organized in the map:

Those referred to the cause of the syndrome (A)

1) The “Duesberg” controversy about the cause of the syndrome;

Those referred to the source of HIV (B)

2) the controversy about the subspecies of chimpanzee carrier of the ancestor of HIV-1

Those referred to the provenance of the epidemic (C):

3) The direction of infection between Haiti and USA

4) The exact epicenter of HIV-1 group M epidemic (Central Africa vs Central West Africa)

5) The timing of the start of the epidemic (before or after WW II)

Those referred to the causes of the epidemic (D):

6) the Marx/Hahn controversy about considering or not AIDS a zoonosis

7) The “Gisselquist” controversy about the main way of transmission of HIV in Africa;

8) The determinant of the passage of the epidemic virus from monkeys to humans

Controversies 2, 4, 5 and 8 oppose mainly Hooper, supporter of the OPV/AIDS hypothesis vs Hahn/Sharp/Korber groups, but the positions are not analyzed here. However it's evident that the OPV/AIDS hypothesis remains at different levels the main impulse for the discussion about the origin of AIDS.

The grid of lecture and then the map of the topic "origin of AIDS" discussed in this and the previous chapter, show the complexity of the topic at a macroscopic level, and that the topic is still very controversial. However, this work offers an orientation tool to locate the different discourses on the origin of AIDS.

In this chapter it has been shown that at least two main contexts keep their attention on the origin of AIDS: the studies about emerging infectious diseases; the studies about the primate immunodeficiency viruses.

PLAN FOR FURTHER RESEARCH

This chapter represents a proposal for future research on the origin of AIDS, with the objective of confronting the controversies listed at the end of the previous chapter.

The proposed plan, presented in the figure 2, is structured in three phases.

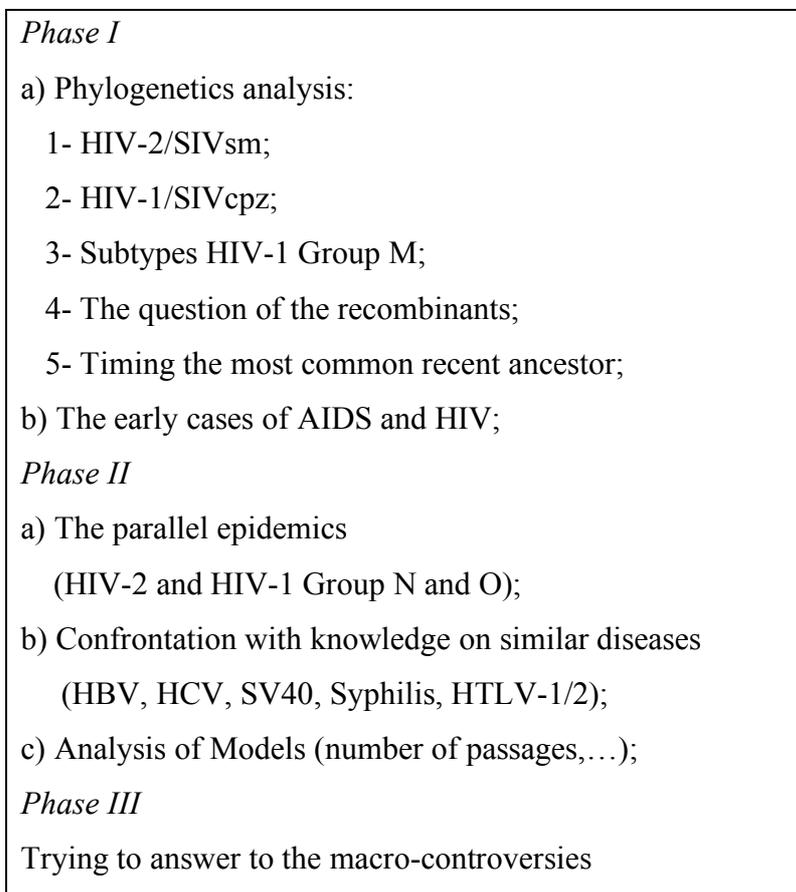


Figure 2 - Plan for further research

The proposed plan starts from the research in different inter-disciplinary questions (micro-controversies) concentrated in particular in the field of molecular biology, which are then completed with the information from other fields to try to answer the main questions (the macro-controversies).

The first step in phase I, divided in 5 parts, consists of an analysis of the knowledge available from molecular biology studies on primate immunodeficiency viruses. This review of the knowledge of

the field is essential because AIDS is connected with HIV, and HIV has been understood basically starting from phylogenetic analyses.

The first two parts of this step refer to a review of the arguments about the relations of HIV-1 with the SIV of chimpanzees and the relation between HIV-2 and the SIV of sooty mangabeys. For the latter, the main question is to understand how close the families are and if the human subtypes A and B, responsible for all the known cases of AIDS from HIV-2, are directly connected with the monkey virus or if an intermediate step needs to be included. For HIV-1 instead, things are more complicated. It is necessary to re-evaluate if SIVcpz/HIV-1 are strictly connected. Then the discussion would move into the exact subspecies and then, as for HIV-2, if they are directly linked or there was an intermediate step to make the monkey virus adapted and pathogenic to humans.

The third and the fourth parts are concentrated on the subtypes of HIV-1 Group M. Here the main question refers to their diversity and variability and where they are and they have been present. This is an important argument for the search of the epicenter of the pandemic. The study of the recombinants is relevant for understanding the dynamic of the virus. It is important to consider the impact of recent recombinations, which can for instance disturb the results of molecular clock models' analyses. Another important point is the relevance of "old" recombinations for the evaluation of what happened at the very begin of the epidemic, and how many passages there were at the same time from monkeys to humans. This point has never been considered before in the literature.

The fifth and last part would be concentrated on the modeling of a molecular clock for Timing the Most Recent Common Ancestor (TMRCA) in particular of HIV-1 Group M and HIV-2. These estimations, very relevant to set a date of the beginning of the epidemic, have been a central argument between supporters and opposers of the OPV/AIDS theory. The STS approach is here particularly important to evaluate the choice of the model assumptions and the extrapolation of the conclusions.

The second step of phase I concentrates on the analysis of the early cases of AIDS and HIV and on their discussion. It is important not only to revise the cases, but also to be conscious of the mechanisms used for accepting or discarding them (again it is evident the need of an integration of a STS approach).

After this two steps it would be possible, in a second phase, to sum up the information collected and to try to resume the knowledge about the minor HIV epidemics, i.e. HIV-1 Group N and O, and HIV-2.

Then the confrontation with other epidemic and/or infectious and/or animal diseases would be helpful. Examples are: HBV, HCV, SV40, Syphilis, HTLV-1/2.

An interesting following step would be to analyze the studies concerned with a mathematical modeling of the epidemic.

In a third phase the macro-controversies will be reviewed.

Comments to the plan

From a personal point of view, the questioning of the cause of AIDS, proposed by Duesberg's controversy, is of no particular interest if not in the context of sociologic studies on science, as well as the evaluation of the hypotheses that do not consider HIV has related somehow to the PIV family. The data about an African origin of the pandemic are also very strong, so it is not worthy to consider other alternative epicenters outside Africa.

The best profile to conduct this kind of research would be that of a Science and Technology Studies specialists, because of his skills in analyzing scientific controversies, with a background in the philosophy of science, too, which could be useful for a discussion about the acceptance of scientific proofs (examples can be the acceptance of early cases of AIDS or the assumption of the phylogenetic models). He would be also able to integrate in the discussion his knowledge about the transmission or non transmission of scientific information both at an intra- and an inter-disciplinary level (for example: forgotten, avoided or unseen articles).

It is foreseeable that such a project could find problems to relate to a specific discipline, in particular inside university structures. The work would not belong to the STS tradition or to the social and cultural tradition of history of medicine because of its lack of impartiality and symmetry and it would not belong either to none of the life science disciplines, because too subjective, not circumscribed within a single discipline and integrating social and political components.

The context of medical geography and medical anthropology would be the most appropriate.

Eventual positive results from this re-interpretation of the sources available on the origin of AIDS would maybe suggest new specific researches, for instance, new archival researches on malaria therapy or vaccination campaigns, or new epidemiological surveys in particular zones of Africa.

CONCLUSIONS

This work wants to be a first approach to a multidisciplinary investigation on the origin of AIDS and an invitation to further research on the topic. The main drive for it derives from the attention of the informed citizen to the topic due particularly to the perception of a human responsibility in the start and/or spread of the AIDS epidemic (a scale of the different grade of human responsibility has been presented).

However, the first basic result consists of a collection of the main sources on the topic.

Then the different interpretations of the expression “origin of AIDS” have been presented and a grid of lecture of the topic has been constructed.

It has been shown that such a grid of lecture is necessary because the scientific discourses about the origin of AIDS usually adopt the form of theories or hypotheses, which are incomparable among them, not only because of the semantic pluralism of the expression “origin of AIDS”, but also because they do not accept the same background knowledge.

The grid of lecture of the topic allows to deconstruct each hypothesis in its components, making them comparable to other proposals. However this new grid of lecture doesn't make the topic fully separable in subfields, because in different ways all the hypotheses try to answer to the question of the origin of AIDS. Nonetheless, four subfields can be identified inside the topic of the origin of AIDS: the cause of the syndrome, the source of HIV, the provenance of the AIDS epidemics and the determinants of the AIDS epidemics. These subfields belong to different disciplinary contexts: 1) etiology, 2) virology and molecular biology, 3) epidemiology, 4) medical geography and medical anthropology.

There is a special interest about the origin of AIDS in two main contexts: the studies of emerging infectious diseases and the studies of the Primate Immunodeficiency Viruses.

A map of the main macro-controversies have been constructed (figure 1), and the still open controversies are have been listed for each subfield.

Three fundamental questions remain however far from answered:

1) Which have been the necessary determinants of the AIDS epidemic?

2) is HIV/AIDS a case of zoonosis?

3) What are the human responsibilities in the start and early spread of the AIDS epidemic?

These questions belong mainly to the fields of medical geography or medical anthropology, but their answers evidently depend on information from other disciplines. The new researches proposed in this work aim to give an answer to the still open macro-controversies, facing in the first place a list of micro-controversies concentrated mainly in the field of molecular biology. It is important to be clear about the methodology to be used in such a multidisciplinary approach, because of the evident subjectivity of this type of research. The profile of a Science and Technology Studies specialists is considered the most appropriate for the task.

It is improbable that the open macro-controversies will settle, because it's hard to imagine that conclusive and compelling data will be produced. However, AIDS is considered paradigmatic in different ways: as an epidemic, as a pandemic, as an infectious disease, as an animal virus disease, as a social and sanitarian catastrophe, as an intensively investigated disease. To conclude that it is not possible to determine the origin of AIDS because the data are not enough, has at least consequences at a philosophical level. What should we conclude then about the deductive and predictive capacities of science? What are its capacities of evaluating the risks in other issues like Genetic Modified Organisms or xenotransplants if this case has not been solved? If science is unable to give grounded answers to these questions, then all the more so the citizen needs to be integrated into the scientific discussion and to become an active participant in the policy making. The remark of the anthropologist Moore can resume the awareness that humans should have about specific medical and technological activities:

«Given the precarious status of each of the current theories, it seems more reasonable to try to keep an open mind until better evidence emerges and, in the meantime, to consider the literature on each of these origin stories as representing a highly refined simulation scenario. Insofar as there is any material benefit to come from understanding the origin of HIV in terms of cautionary tales, each model can and should be considered plausible—and worrisome. After all, unsterile needles do transmit diseases, contaminated polio vaccine did spread a simian virus (one called SV40) to millions of people, doctors do sometimes conduct risky research, colonial policies did have major health consequences, and contact with wild animals can introduce pathogens into humans.

An obvious general lesson can be drawn from all four theories: For some very puzzling reason, the origin of HIV was not fundamentally natural, given that humans apparently failed to acquire an immunodeficiency virus from simians during thousands of years of exposure»¹⁹⁰.

¹⁹⁰ (MOORE, J., *Am Sci* , 2004)

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