Medicinal Plants of Antiquity

EXPEDITION BRIEFING

Dear Prospective Volunteer,

Welcome to the world of medicinal plants in the ancient Mediterranean!

Medicinal Plants of Antiquity is entering its second year. As Principal Investigator, I shall be glad to introduce you to the ancient plant lore, through book and archeological exploration. When Byzantium fell in 1453, the West was rising. Gutenberg was creating the printing press, allowing the reproduction of ancient Greek and Latin texts more quickly than by hand copy, and in a high number of copies. Books on medicinal plants, the so-called *Herbals*, were the very first books to be printed and nicely illustrated. As early as 1530, a new knowledge developed, which led to Pre-modern botany and pharmacology.

Besides textual knowledge, archeology contributes to our knowledge of ancient medicinal plants. Vegetal remains in archeological fields, instruments from excavations, and plant representations in ancient monuments complete our documentation with contemporary material, some of which can be submitted to laboratory analysis to be properly identified.

This is the fascinating world I propose to explore together. We shall recover the ancient therapeutic practices of healers recorded by physicians of Classical Antiquity and the Middle Ages, such as Hippocrates, Galen, and Avicenna, printed during the Renaissance. Texts and pictures will be added to a constantly growing computerized database, and archeological material will complement this documentation and contribute to create a comprehensive collection of data to sum up this legacy of Humankind now exposed to oblivion.

Not only will this program contribute to the conservation of unique body of knowledge, but also it will make rare and fragile books available to a wide audience by diffusing their contents. At the same time, it will open new paths for medical research and help the preservation of the environment by diversifying the natural sources for pharmaceuticals.

Cutting-edge research at the crossroad of different disciplines, the program *Medicinal Plants of Antiquity* will give volunteers a unique opportunity to have personal contact with ancient documents, some of which have not been opened for centuries, to rescue a scientific treasure, and to participate in the challenging adventure of creating new knowledge.

This will be a magic moment that will allow volunteers to personally penetrate the world of herbs used in the past by healers in search for cures. I really hope you will enter this fascinating world with me, contributing to this important research, for the completion of which your support is indispensable.

The recreation of the past will continue in a certain way in our daily life, in the beautiful scenery of Rome. History is present everywhere, suggesting that a Roman emperor, a Renaissance humanist or a Don Giovanni could appear at any moment!

I wish to warmly thank you for your interest in *Medicinal Plants of Antiquity*, a project started 25 years ago, and I do hope you will choose it as the beneficiary of your financial and personal support. Your involvement will play a fundamental role in the development of this research, rooted in the past and oriented toward the future.

Looking forward to living with you this extraordinary, rewarding experience. Thanks again, and see you in Rome!

Alain Touwaide, Ph.D., FLS London
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Medicinal Plants of Antiquity

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RESEARCH PROPOSAL

PRINCIPAL INVESTIGATOR:	Alain Touwaide Ph.D.
POSITION / TITLE:	Research Associate
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PROJECT TITLE:	Medicinal Plants of Antiquity
RESEARCH SITE:	Rome (Italy)
TEAM SIZE:	Minimum: 6 Maximum: 10

Abstract of Proposal

The project *Medicinal Plants of Antiquity* aims at reconstituting the lore of medicinal plants used in classical antiquity (8th cent. B.C. - 3rd cent. A.D.). Based in the surroundings of human habitat (particularly common plants and weeds), medicine transformed empirical knowledge with theories shaped by contemporary cultural systems. Characteristically enough, ancient therapeutic literature --including works by such figures as Hippocrates, Theophrastus, Dioscorides, and Galen--were recovered, analyzed, and put in practice during the Renaissance (15th and 16th centuries).

The project intends to collect all material pertinent to the written record of therapeutic practice in antiquity:

- representations of the plants used for therapeutic purposes to be found at archaeological sites;
- Renaissance texts and plant representations in 15th and 16th century printed books;
- data from the field such as current distribution of plants, photographs of plants or local therapeutic traditions still alive;
- plant remains in archeological sites and
- other archeological data related to diseases and their treatment.

For the second year of the project, research will be conducted in Italy at the National Library of Rome, in the archaeological site of Ostia Antica and in Rome (historical monuments, archeological sites and museums). Work will be done with staff and the Principal Investigator. It will consist of collecting data from two sources:

- 15th and 16th century Latin printed books (texts and representations of plants)
- archaeological sites and monuments (representations of plants used for therapeutic purposes and plant remains.

Together with the prescriptions extracted from ancient medical texts and presented in the original text and in English translation in a format readable to a non-specialist, research will contribute to the creation of an unprecedented database containing all extant evidence on therapeutic uses of plants in classical antiquity.

In order to preserve and promote a patrimony of knowledge exposed to oblivion, the project will be available on the Internet and in several derivatives for a wide range of applications (from historical studies to cutting-edge bio-medical research, including protection of environment and bio-diversity, for example). By its use of primary sources, its exhaustiveness and its comprehensive approach to ancient therapeutics, it will constitute an indispensable reference for years to come.

Earthwatch volunteers will live a first-hand experience of personal contact with ancient texts on medicinal plants, also exploring archaeological sites in search for representations of medicinal plants and traces of vegetals in the context of ancient daily life. They will contribute to Earthwatch's mission in a unique association of history, bio-medical sciences, field archaeology, and classical scholarship, while also enjoying a personal experience of life in one of the most historical cities of the world.

RESEARCH PLAN

1. THE PROJECT

Note: Numbers between square brackets ([x]) in the text refer to the bibliography at the end of the briefing (Section 20 'Literature Cited').

The goal of the research project *Medicinal Plants of Antiquity* is to reconstitute the plant lore used to treat sick people in classical antiquity (8th cent. B.C. - 3rd cent. A.D.).

Ancient practice of therapeutics is evidenced by three main kinds of sources: **a)** archaeological vestiges, for example, temples of Aesklêpios such as in Corinth, Greece [22], or inscriptions commemorating a cure or ex-voto to be found at many sites [61][62]; **b)** case stories reported in literature as, for instance, the plague of Athens recorded by the historian Thucydides or therapeutic miracles performed by Aesklêpios [10] and, later on, by Christian saints [21][29][41][42]; **c)** medical and scientific works by doctors such as Hippocrates [39] [51] and Galen [46], for example; scientists such as Theophrastus [1] [37] and Dioscorides [58] [88]; or an encyclopedia such as Pliny's *Natural History* [66].

The project focuses on medical works, specifically those devoted to pharmacological therapy. These described natural substances (animal, vegetal, mineral) used for therapeutic purpose, explained the properties the substances were credited with, and mentioned the diseases for which they were used [83]. Some of these works also contained representations of the items dealt within the text, particularly plants [20].

In a 1999 article on traditional antihelmintic, antiparasitic, and repellent uses of plants in Central Italy, P.M. Guarera compared the practices of Central Italy with those of other areas of the Mediterranean world [33]. He hypothesized the existence in past times of a single corpus of folk experiences shared by European countries overlooking the Mediterranean, which is perhaps the inheritance of the ancient medicines. This inheritance of ancient medicines is precisely the body of knowledge that the project aims at reconstructing with the help of Earthwatch volunteers, to make it available to the scientific community and a wider audience.

In a 1989 volume devoted to the treatment of bronchial diseases, Irwin Ziment, a clinician, contributed a long article on the substances used through history to treat excess of bronchial mucus [90]. He started declaring that "Most of the drugs currently available throughout the world for the treatment of pulmonary disorders are derivatives of ancient medications, many of which are known to have been in use for over 5,000 years…Western drug therapy had its origins in Mediterranean and surrounding civilizations." After an overview of all drugs used to treat pulmonary diseases in ancient Mediterranean cultures, as well as a thorough analysis of some of these drugs (including reports of clinical trials), he concluded "many of the drugs in current use have been employed for thousands of years…the recognition that many traditional agents have a multiplicity of therapeutic applications is reciprocated in contemporary discoveries." He thus recommended considering traditional remedies and analyzing them.

However, in *Herbal medicine* [91], Ziment and Rotblatt stressed that the literature on medicinal herbs (be it popular or medical) is difficult to interpret. Characteristically enough, a similar concern was expressed by a scholar working at the other end of the spectrum of disciplines

involved in the study of ancient botanical and medical texts: the classicist John Raven, who specialized in the identification of the plants quoted in ancient literature. In his book *Plants and plant lore in ancient Greece* (2000), he invited scholars "confronted, in whatever Greek text…with a problem of botanical identification…to remember the wisdom of Socrates" [67]. In other words: scholars should honestly recognize their own ignorance. However provocative it might be, as was Socrates' doubt, Raven's conclusion is eloquent.

Interest for the plants of antiquity (medical or not) thus comes from different sectors, also including philology [3] [4], history [5] [6] [7], history of food [23] [24] [25], botany [27] [63], environment [36] and landscape studies [31], for example.

The research project *Medicinal Plants of Antiquity* will make a significant contribution to fill the current lacuna of scholarship. Although work has been done on the topic, it is now obsolete [12] [13] [30] [48] or deals with limited issues [5] [6] [7] [70] [72] [77] (with the exception of the THEOREMA program [57]), not proceeding with a clearly defined methodology. In the time period it covers (8th cent. B.C. to 3rd cent. A.D. and its characteristics), *Medicinal Plants of Antiquity* will complete the THEOREMA program [57], also going beyond it. The latter's result, indeed, was a printed reference dictionary of plant quotations in medical text without further information. Our project, instead, aims at collecting on computer all extant evidence of any kind (textual, iconic, archaeological and botanical principally), also adding all secondary literature. The database will include identifications of plants according to current botanical nomenclature, the uses of the plants, a full quotation of the ancient texts (both in the original language and in English translation) and all relevant data.

Computer storage of this information will allow retrieval according to different parameters: by plant (all therapeutic uses over time in chronological order), by disease (all therapeutic agents in chronological order), by period (all diseases and therapeutic agents) or by places (all diseases and therapeutic agents in chronological order). The unprecedented amount of data will generate meta-information that transcends single items and contributes to their explanation, also opening new paths for innovative research. To mention an example, the listing of diseases (with their number of occurrences) and their possible sequencing in chronological order of the texts will constitute a primary source of a new kind to develop an epidemiology of the ancient world. Quantitative data (including their evolution over time, possibly also by places) will complement archaeological evidence (DNA analysis and identification of pathologies) [73] [74]. This will highlight the dynamics of disease processes among Mediterranean populations, also providing medical research with a tool for a better understanding of contemporary health situation(s).

Research like this must face two fundamental facts:

1. Ancient descriptions of plants rarely provide modern analysts with the relevant information for the identification of plants [1] [37] [58] [28]. Supplementary data can be found, however, in Renaissance literature (15th - 16th cent.), for scientists of that time rediscovered ancient scientific literature, among other pharmacological texts [8] [56] [59] [68] [78] [81]. Commenting on them, they identified the medicinal plants. Nomenclature has changed since, particularly after the adoption of the system created by Linnaeus (1701-1778). However, the changing names and descriptions of a plant can be traced in the literature from the Renaissance to current times. On the basis of Renaissance and later literature, it is possible to highlight ancient texts and to identify plants using current nomenclature.

2. Ancient ways of describing plants and analyzing, conceptualizing and expressing their therapeutic properties was deeply influenced by cultural parameters [84]. Work on ancient botanical and pharmacological texts may not be limited either to a literary approach or to a verification of the properties the plants were credited with [35] [69], but needs to include - if not

to start with - an anthropological study of the values attributed to plants. A particular source from this point of view is the representations of plants, be it in scientific [20] or artistic context.

Though unprecedented by its purpose and its systematic character, the research will have to take into account a considerable amount of bibliography: philological analyses of plant names [3] [4] [18] [81]; literary studies on plants in classical literature [9] [52]; analyses of plant representations in art [9]; monographic entries on plants to encyclopedias of classical culture [17] [60]; dictionaries of plant names [80]; attempts to identify in Byzantine and Arabic manuscripts the plants used in antiquity [15] [28] [30] [48] [49]; and pharmacological studies of therapeutic uses of plants based on historical data [11] [35] [70] [72] [90] [91]. In many cases, however, prior work did not rely on the original text of the primary sources [2] [9] [90] [91] or on an exhaustive collation of the extant evidence.

By its contents, the retrieval of information according to different criteria, and the meta-information it creates, *Medicinal Plants of Antiquity* will be useful for applications in fields as different as medical research, protection of bio-diversity and environment, promotion of traditional cultivars and preservation of local therapeutic traditions and folklore, all the more because the database will be open to users on the Internet. Cultural and historical studies also will benefit from the project, for example, with a renewed analysis of the assimilation of ancient science into Western culture during the Renaissance [14] [56] [89]. As a consequence, the concept of Scientific Revolution will have to be revisited. However, before any application and as an immediate result, the project's work will preserve a patrimony of scholarly knowledge exposed to oblivion because of the linguistic skills required for the collection of data from primary sources, the huge amount of evidence conserved and the multi-disciplinary and trans-period approach needed in its interpretation. This invaluable treasure of experience will be put at the disposal of both the international scientific community and non-specialists in a readable format and in an easily accessible form.

Certain urgency is required since classical scholarship is dramatically receding in contemporary society and education, pressure on the environment and bio-diversity is high and the need for affordable and sustainable solutions to health problems of world population are strong. For these multiple applications, the project will constitute a reference work for years to come, also being an instrument for policy making for issues of crucial importance in contemporary society. The new approach to drug testing, for example, will have to be taken into consideration in the current re-organization of the health system. Scientific study of traditional medicine should be supported, as well as the use of traditional medicines whose efficacy and safety have been verified. Similarly, environment and agriculture issues will be addressed, opening the way to new solutions for sustainable development taking into account the experience of the past.

Earthwatch has a long and respected reputation in recovering and promoting traditions, environment, and bio-diversity. With the help of Earthwatch volunteers, the Principal Investigator wishes to contribute to this goal by means of a non-traditional association of bio-medical sciences, history, anthropology, and classical scholarship.

2. RESEARCH OBJECTIVES

The general goal of the program is to reconstitute the plant lore of the Mediterranean world in antiquity. In order to achieve this goal, we will undertake the following three objectives:

1. We will collect book data: text and illustrations in Renaissance printed editions and commentaries on ancient medical texts and in Renaissance works on medicinal plants (early books or *incunabula* [~ 15th century] and 16th century books).

2. We will collect archaeological data: plant remains from archeological excavations and evidence for representations of medicinal plants in daily life from archaeological vestiges, that is, pavement mosaics, frescoes, and architectural structures of any kind.

3. We will collect botanical data: as medicinal plants are studied on the basis of the data collected as above (including the texts extracted from primary sources by the PI), the resulting plant identification will allow us to do botanical field work to verify the current distribution of plants in the Mediterranean area.

The three objectives will be gradually addressed over time in order to contribute to the long-term goal of gathering all extant data to reconstitute ancient therapeutic lore.

In a first phase of the research (that is, over the past 10 years), the PI has collected four kinds of data in order to prepare the project:

1. Therapeutic prescriptions in ancient primary sources;
2. Plant representations in pre-printing sources, that is, ancient manuscripts (Greek and Arabic);
3. Identifications in post-Linnaean literature for the plants mentioned in ancient medical texts [82];
4. Contemporary literature of any kind on the topics involved in the research.

These data are recorded in computerized databases.

The global research has now reached a second phase. Previously collected material needs to be complemented with information of two kinds:

1. Textual and iconic data from Renaissance books;
2. Plant representations from archaeological vestiges.
3. Plant identification on the basis of laboratory analysis of archeological remains.

Work needs to be done in the field:

1. Libraries with significant Renaissance holdings;
2. Ancient archaeological sites.

Rome (Italy) offers both, also being conveniently located and enjoyable (see 'Research Area', 'Accommodation', and 'Food'). Furthermore, it is close to important archaeological sites containing material to be included in the research (Ostia and Villa Adriana, for example).

Over time, however, both the objectives of the research and its location will evolve: at the beginning, collection of data from book will be a priority. As this work will progress, collection of archaeological and botanical data will gradually become more important. The location of research will move accordingly (Southern Italy, Spain, Romania, Greece, Turkey, Jordan).

Renaissance data will fill the gap existing in the current state of the research between ancient texts on the one hand and scientific plant designations on the other. Systematic collection of Renaissance data (textual and iconic) will make it possible to reconstitute the continuity in the scientific study of ancient medical, *viz.* pharmacological works from 15th/16th century to present day. All extant data available in literature will be assembled for each plant, constituting a monograph to be used in the study, among others in the identification of plants.

From published catalogues of 15th and 16th century printed books (specifically devoted or not to botanical works) [19] [26] [34] [40] [44] [45] [64], the PI will establish a list of relevant works. The total number of books to be examined should be ca. 350 (including re-editions of previously published works). For each item, the following data will have to be collected:

1. Physical description (material characteristics of books);
2. General description of the contents (identification of the texts contained in the books);
3. Specific description of the botanical/pharmacological contents;
4. List of plant representations.

This material will be collated, particularly in the following cases: successive editions of a single work; different works published by the same printers; pirate editions of previously published works. It is a known fact, indeed, that plant representations were freely transported from one work to another by Renaissance publishers/printers who also did not hesitate to reproduce sets of pictures that they did not own [8].

Archaeological excavations are reported in articles and monographs. The PI will research and record the library material dealing with plants at the sites of Ostia, Villa Adriana, and Pompeii (for example, [38]). On this basis, he will establish a list of archaeological evidence (representations of any kind of medicinal plants) to be included in the research.

Fieldwork will consist of: **a)** locating the pieces to be considered, verifying the accuracy of published description and reproducing them (digital pictures), and **b)** in collecting in archeological excavations material any kind (plant remains, pieces of wood of all types, osteological pieces and possibly also instruments) to be further submitted to laboratory analysis

Collected data will be recorded on computer in two databases (a textual and an iconic one) to be further interrelated with those already existing. The whole set of databases (associated with the analysis made possible by means of the whole information) will constitute the substance of the Website to be further created.

3. METHODS

In order to reconstitute the plant lore used in antiquity to treat diseases, the volunteers, staff and Principal Investigator will collect Renaissance material (textual and iconic) on the medicinal plants of antiquity, together with archaeological remains and representations of medicinal plants. We will then constitute computerized databases and inter-relate them with those already created by the PI, to constitute an exhaustive textual and iconic monograph for each item included in the research. On this basis, we will be able to verify the continuity of scientific study of medicinal plants from antiquity to present time. A limited number of case studies will allow us to ascertain the validity of the procedure and approach.

For a correct and efficient organization of work, a preparatory phase will include identifying and carefully reporting Renaissance books to be analyzed in the field. The PI will identify the relevant items in published catalogues of 15th and 16th printed books [19] [26] [34] [40] [44] [45] [64], also consulting the on-line catalog of the National Library of Medicine, the Library of Congress, and the Wellcome Institute for the History of Medicine in London. Titles will be recorded on computer. The list will be arranged alphabetically and the copies of the National Library of Rome will be identified with their call numbers.

Fieldwork will take place in the Rare Book Room of the National Library. The PI will first teach the volunteers how to analyze ancient books [2] [8] [16] [47] [53] and give a general presentation of the history of botany, medicinal plants, and alimentary uses of plants in antiquity [23] [24] [25] [50] [54] [55] [69] [79] [83] [87] and the Renaissance [2] [8] [59] [68] [85], including plant representations [20]. In so doing, he will also present the relevant bibliography, which will be at the disposal of the volunteers during their stay. This workshop will take place the first day (9:00 to 12:30 am, with two sessions of one and a half-hour interrupted by a 30 minute break).

The PI will initiate the volunteers to the terminology and techniques of ancient book analysis by using paper models, schemes, and slides. A handout will summarize the main elements, also containing a glossary of technical terms. Relevant recent manuals (in English) on the topic will be put at the disposal of volunteers for the total length of the stay with supplementary relevant literature [16] [47] [53]. A special issue will be the conservation and handling of ancient books, especially, the proper way to handle the books during volunteers' work: no food nor drink in the study room; books have to be put on cradles; no pens can be used; pages have to be handled delicately; hands have to be kept off the printed surface of the page; tight bindings may not be forced; and the like.

Although no specific linguistic skills are required, knowledge of Latin and Italian (even basic) would be an advantage, both to better understand the books and to enjoy daily life in Rome.

In the field (that is, in the library), volunteers will work with the PI. The first day, volunteers will be enrolled as patrons. A valid document with a picture ID will be necessary. Volunteers will be provided with paper, pencils, and a ruler (centimeters and millimeters). Each volunteer will be in charge of a book to be chosen according to the degree of confidence and possible personal interests and skills (for example, linguistic knowledge since some books are in Italian, Spanish, German, and English). To ease work, volunteers' will use a form to be filled in with the description of the books. These forms will guarantee that data are collected in a standard way, also making the transfer of information to computer easier. They will include all the descriptors of the books (physical description), of their texts and of their illustrations, the name of the volunteer and the date. Upon completion of the work and, in any case, at the end of the stay, forms will be filed in boxes constituting the archives of the project.

According to the volume of the books (some include ca. 75 plants and others 700) and personal skills, volunteers should be able to analyze a book in a period varying from 3 to 8 full work days.

In the case that more copies of the same item are available, they will be collated to verify that they do not constitute different issues.

Every day, a short period before dinner (30 minutes) will be devoted to study (review of the notes of the day) and/or to an informal briefing. This period will allow volunteers to review the discoveries of the day, to discuss their significance and relation to the projects goals, to ask questions and to solve the problems arisen during the day, and to share their personal experiences.

All collected data will be double-checked by volunteers in collaboration with the PI upon completion of the analysis, to ensure quality and reliability of the work. As books are studied in this way, data will be recorded on computer and, if possible, their representations of plants will be recorded (digital pictures) by one or more volunteer(s). Together with plant illustrations in ancient manuscripts, these pictures will permit us to follow the representations of a plant from the most ancient evidence to current scientific tables.

Archaeological fieldwork will be organized in a similar manner. In a preparatory phase, the PI will first research published material about representations of medicinal plants at sites such as Ostia Antica and Villa Adriana, for example, as well as at Roman sites like the Forum, or the Domus Aurea. Each item will be carefully recorded on computer.

Research in the field will be conducted at Ostia Antica, by the entire team of volunteers in collaboration with the Principal Investigator, staff and local archaeologists. Before, volunteers will receive information on the site with the current bibliography in English. Please refer to the 'Itinerary' section for further information about the days the team will be at Ostia Antica.

Work will consist, first, in locating plant representations (first on the basis of the photographic archive and then – when they are still existing - in their original site), in accurately describing them, defining their meaning and function in their context and interpreting them and, conversely, determining their contribution to the topic.

When possible, work will also include collaboration with archeologists, so as to collect, organize and store plant and other remains to be further shipped to the US and submitted to laboratory analysis at the Smithsonian Institution.

For both book and archaeological data (plant representations), forms will constitute the archives of the project. Transfer of data to computer will be done by one or more volunteer(s) and completed by the PI upon conclusion of the season.

Collection of data by volunteers thus will make it possible to gradually cover the considerable workload to be analyzed. Piece by piece a huge amount of information will be constituted that could not be covered by the PI alone. Furthermore, a meta-information will result from the addition of all the collected data, giving its unique value to the project.

Upon completion of the stay and in the future, volunteers will be informed about the progress of the research to have a feedback on their contribution to the main goals of the project. A mailing list will be constituted and the address of the volunteers will be added upon completion of each stay.

Similarly, contribution of the volunteers will be acknowledged in the diffusion of the results of the project, together with the support of Earthwatch.

4. APPLICATION OF RESULTS

The project will offer an unprecedented collection of evidence from primary sources in a readable format, together with all the relevant secondary literature for a correct interpretation of primary data.

All data will be available on the internet, on a website to be developed in the future. At the same time, iconic data will be diffused under the form of CDRom. Complementary, alternate publications will derive from the database (see below).

The project will be of interest for several audiences: specialists, the educational community, policy-makers, and the general public.

Specialists will come from a large spectrum of fields, from the human sciences to the most advanced bio-medical research. Among human sciences specialists, one could mention classicists,

historians of antiquity, historians of art, historians of the book, historians of the sciences (particularly botany), historians of medicine generally speaking or, more particularly, of therapeutics and pharmacology, anthropologists, and historians of environment and landscape. Among bio-medical scientists, doctors, clinicians, pharmacologists, epidemiologists, botanists, agronomists, and environmentalists are some, together with ethnoscientists, particularly ethnobotanists and ethnopharmacologists.

As for the educational community, it will have at its disposal a reference work for a high number of applications in teaching, essay writing, or occasional consultation in all the above fields. The website version will be accessible to all end users of the Internet and the CDRoms should be purchased by all public, school, or college libraries. At the same time, the project will constitute a prototype for other similar achievements dealing with high amounts of data and/or classical texts and material. The principle of collecting all the extant data and creating a meta-information on this basis can surely be transferred to other fields and problems, leading to new research programs and hence to the production of new reference works for further scientific investigation.

Policy makers will take a particular advantage from the project: they will have a complete and comprehensive body of data, systematically organized and analyzed, and susceptible to an infinite number of combinations. The database resulting from the project thus will be a perfect instrument to verify the impact of traditions on several crucial current issues and to guide strategic decisions that will affect entire communities. Among others, one could mention the reorganization of drug production and procedures of drug control by State institutions, the promotion of traditional medicines and their integration into public health service, the diversification of the sources for traditional medicines with the consequence this will have on agriculture, environment and bio-diversity or, to quote some, a revision of high school teaching programs by showing the actuality of ancient languages and history, as well as multi-linguism.

The general audience will benefit from the recovery and valorization of ancient plant lore, all the more because it is related to health, a topic for which there is a great sensibility in contemporary society. The awareness of ongoing research and interest will be developed in the general audience by means of articles in media with educational vocation.

Results will be available on the internet and under the form of CDRoms (plant representations in ancient manuscripts and early printed books, for example). They will also be communicated by traditional means of different, but complementary types: monographs, articles in scientific journals, papers and posters in congresses, lectures.

Among the monographs deriving from the research, there will be a Flora of Classical Antiquity, the proposal of which will be submitted to a major publisher specialized in reference works in classical studies.

Articles will be submitted to scientific journals (that is, peer reviewed journals with an international impact) specialized in classical studies, history (especially ancient), history of bio-medical sciences, history of science, history of the book, anthropology, ethnobotany and ethnopharmacology. Among others: *Studi Italiani di Filologia Classica*, *Transactions of the American Philological Association*, *Mediterranean Studies*, *Bulletin of the History of Medicine*, *Journal of the History of Medicine and Allied Sciences*, *Archives of Natural History, La Bibliofilia*, *Scriptorium*, *Journal of Ethnopharmacology*, *International Journal of Pharmacology* or, to mention only some, *Economic Botany*.

Papers and posters will be presented in meetings such as those of the American Philological Association, American Association for the History of Medicine, American Institute for the History of Pharmacy, Kalamazoo MI Annual Medieval Congress, International Society for the

History of Medicine, International Society for the History of Pharmacy, International Botanical Congress and similar.

Lectures will be delivered on the basis of invitations, both in the United States and in Europe, in university faculties and departments of medicine, pharmacy, botany, classics, history and anthropology.

Also, articles will be submitted to popular journals with educational vocation, starting with *Earthwatch Journal* and others like *Smithsonian* and *Historia*, for example, or journals of complementary, natural, and alternative medicines.

5. FIELD TRAINING

Communication with volunteers will start before arrival at the site. Volunteers are strongly encouraged to have read the documentation about the history of botany and therapeutics in antiquity and the Renaissance, and the history of the book and book illustrations (see 'Reading List'), and to already be a bit familiar with the topic of the research.

Upon arrival (Sunday) and after the volunteers have recovered from air travel and have settled in, there will be an informal welcoming session including presentation of research staff and self-introduction by Earthwatch volunteers. For each team, the PI will leave a notice at the B&B to inform volunteers of the exact time of the meeting (which can vary according to arrival times of the volunteers). The first day (Monday) will be devoted to a workshop in the morning (including the enrollment as a reader at the National Library) and to a short walking/orientation tour in Rome in the afternoon, scouting the neighborhood of the accommodation and identifying major references in the city to facilitate further orientation. Coming after the workshop, this walk will be an excellent occasion to chat, all the more because it could include, according to the fantasy of the volunteers, to eat one (or more) of the fantastic Italian ice-creams, the famous gelati. Similarly, since the accommodation is not distant from the National Library, volunteers, staff and Principal Investigator will go and come back walking, enjoying the streets of Rome and, if we want to do so, stopping in a bar to have an Italian coffee (an espresso) or buying a newspaper, in Italian to get some acquaintance with the language, in English or in the volunteers' mother tongue to have fresh news from home.

At the library during the work sessions, staff and Principal Investigator will be at the disposal of the volunteers to answer their questions, assist them to solve problems, ensure a good ambiance of work, and supervise research.

During the days of library research, volunteers will have two hours of free time after work and before dinner. Similarly, a half-day at the end of the stay will be devoted to shopping (personal items, gifts and souvenirs for family, friends and relatives, and so on).

Every day, a 30-minute session after work will be devoted to an informal discussion of the work accomplished during the day; and will include in any case a free question/answer period also including discussion of unforeseen situations.

During the week, dinners will be taken together (Monday, Tuesday, Thursday and Friday), enjoying traditional Italian food. Meals will be a supplementary opportunity to talk, to have fun, to stay together. Volunteers will have a free evening on Wednesdays to choose an activity according to their own interests (movie, theater, concert, dinner in Trastevere, meeting friends

and so on). At the end of the stay, a dinner will be offered in a restaurant, which will be a further occasion to exchange addresses, take a final picture of the group, and think of the next year.

6. VOLUNTEER ASSIGNMENTS

The collaboration of 6 to 10 volunteers by team will be of primary importance for field work. During the stay (2 full weeks including arrival and departure days), 10 and a half days will be devoted to research. The first full weekend of the team will be free (Saturday and Sunday).

Work time will be devoted to four main activities with the following proportions of global work time:

1. Workshops (10%)
2. Library research (50%)
3. Work on archaeological sites (20%)
4. Short visits (10%)
5. Computer entry (10%)

The afternoon of Saturday (second week) will be reserved for packing, shopping, etc.

1) Library research will take place mainly at the National Library of Rome (Biblioteca Nazionale Centrale, Roma = BNCR). In addition, work could also be done in other state libraries of Rome such as the Biblioteca Angelica or the Biblioteca Casanatense depending upon the needs of the research.

In any case, volunteers will have access to the Rare Book Rooms. No food or drink whatsoever can be brought inside the library. Similarly, no bags may be taken inside. Volunteers will put personal objects (if any) in lockers at their disposal at the entrance. Silence is a rule.

At the National Library, volunteers will enroll as patrons on the first Monday morning (they will receive a renewable yearly card). Daily work will run from 9:00 am to 12:15 pm and from 1:15 to 5:15 pm. The work will be followed by a Q&A and evaluation of the work done during the day (5:15 to 5:45 pm).

Library research (be it at the BNCR or other libraries) will deal with the analysis of 15th and 16th cent. books (herbals or volumes on related topics). Volunteers will analyze a book each using the forms prepared by the PI. After enrollment the first day, Volunteers will have a workshop to get familiar with the history of ancient printed book and its techniques of analysis, so as to have an exact understanding of the research to be performed.

Analysis of books will proceed in six main phases:

1. General perception of the book (all the more because it will probably be the first time volunteers have in their hands 15th or 16th century copies) and review of the bibliography;
2. Physical analysis: measurements, number of folios/pages, number and structure of gatherings;
3. Identification of data: author of the work contained in the book, title, publisher, place and date of publication, colophon (identification of the publisher, including place and date of publication at the end of a book - if any);
4. General identification of the text(s) contained in the book;
5. Detailed identification of the botanical contents;

6. Detailed identification of plant representations;

At the BNCR, work will also include the following:

1. revision of data collected by volunteers in 2003; checking data against the original books;
2. photographing plant representations in collaboration with the PI;
3. construction of the database on computer;
4. transcribing on computer relevant passages from the books under study.

For library research, no special knowledge is required. The volunteers will receive both the technical information necessary to perform the research, and historical insights to understand the objects they will be dealing with, the significance of their contribution and the final goals of the project. However, the project is particularly suited for volunteers with an interest in history, history of botany, medicine and pharmacology, history of the book, and scientific illustration. Though not indispensable, a background in classics, philology, and ancient, medieval and/or early modern history, as well as knowledge of ancient languages (even elementary) would be an advantage. It would allow the volunteers to work more expeditiously and with a better understanding, not to speak of the pleasure of handling historical pieces. In analyzing books normally not on public display, volunteers will have the opportunity to see historical pieces of value not accessible to a non specialized audience. Volunteers are expected to sit for several hours per day to accurately screen documentation. Should they wish, volunteers may bring a magnifying lens. Legible handwriting is indispensable to recording data on the forms, which will be further transferred to a computerized database. Although stationery is provided, volunteers are free to bring mechanical pencils for their personal use (no pens are allowed in the Rare Book Room). Volunteers will be working in a historical setting, complete with traditional monastic chairs! We recommend that you bring a small cushion if you think that it could make daily work more comfortable for you.

2) Work on archeological sites. Two consecutive days (Thursday and Friday of the second week, unless weather conditions require a change in plans) will be spent on the archeological field of Ostia Antica (the ancient harbor of Rome).

The site is located at western outskirts of Rome (23 km/15 mi), close to the sea, and can be reached by metro (~45 minute ride and a short and pleasant walk from the station). Volunteers will work in collaboration with local personnel on various simple tasks such as:

- search for plant representations (ancient mosaics and frescos) in the photographic archive;
- similarly, search for plant representations on still existing buildings. In this case, we'll also locate and photograph the representations;
- in function of excavations in course, assisting archeologists, particularly to collect plant remains or other material to be analyzed ;
- preparing the expedition of samples (plant remains) to be sent to the Smithsonian Institution for laboratory analysis;
- inventory, labeling, and possibly also cleaning pieces in storage, particularly (but not necessarily exclusively) material related to plants and their uses.

During Teams I-II, botanical exploration of the site could be included in the program. In this case, a botanist will accompany and guide us to discover the "campagna romana".

3) Short visits: visits in the late afternoon (after 3:00 pm) will be organized twice to smaller sites, museums, and monuments relevant for the research to identify plant representations (mosaics, frescos or sculptures). Places will be chosen according to the progress of research, weather

conditions, opening times and the like. The purpose will be to trace plant representations, photograph, and document them. When possible, an English-speaking guide will accompany us.

7. PROJECT STAFF

The entire project will be supervised by the Principal Investigator in collaboration with a permanent staff member and occasional collaborators.

PRINCIPAL INVESTIGATOR

Alain Touwaide (50 years) will serve as Principal Investigator and Field Director. Currently a Research Associate of the Department of Botany at the Smithsonian Institution, National Museum of Natural History, he specialized in the history of therapeutics and medicinal plants in the Mediterranean world from antiquity to the Renaissance, including Byzantium and the Arabic world. A Ph.D. (Classics, 1981) of the University of Louvain (Belgium) with a Qualification to direct research programs (History, 1997) of the University of Toulouse (France), he has intensively researched and taught in Belgium, France, Italy, Spain, and England. No wonder if he is now fluent in French, English, Italian, and Spanish. In recent years, he was a Fellow at the Dumbarton Oaks Center for Byzantine Studies of Harvard University in Washington DC and a Rockefeller Foundation Fellow in the Department of History of Science of Oklahoma University, Norman, OK. He has lectured and organized exhibitions all over the world and has extensively published on the history of therapeutics.

PERMANENT STAFF ASSOCIATE

Emanuela Appetiti (45 years) will serve as permanent Staff Associate. An independent scholar with a degree in anthropology of the University La Sapienza in Rome (1987), she has special interest in the Aboriginal cultures of Australia, particularly the uses of plants for medicinal purposes. Aside from Australia, she has done field work in China, Siberia, Morocco, and Turkey. She has been involved in the project since its inception. In close collaboration with the Principal Investigator, she collected data from primary sources on the uses of medicinal plants in antiquity and recorded them on computer. Through her ethno-anthropological education and experience, she brings an original contribution in the interpretation of data. A native of Rome, where she spent some thirty years, and a lover of her city, she will help the volunteers discover and enjoy such magnificent places as Fontana di Trevi, the Pantheon, the Ghetto or Saint Peter's, as well as to typical restaurants, bars, or small pizzerias. She is fluent in Italian, English, Spanish, and French.

OCCASIONAL STAFF ASSOCIATES

Scholars and scientists will occasionally serve as Staff Associates. They will temporarily join the team, providing the volunteers with further and complementary information on the topic of the research. This will be particularly the case for the days at Ostia Antica.

FIELD LOGISTICS

8. RESEARCH AREA

There's no escaping it: Rome means history. Etruscan tombs, Republican meeting rooms, Imperial temples, early Christian churches, medieval bell towers, Renaissance palaces, and baroque basilicas. In this city a phenomenal concentration of history and monuments coexist with an equally phenomenal concentration of people busily going about their everyday life.

Rome, Italy's capital, is a lively city characterized by an extreme contrast: among the vestiges of centuries of history, it is a modern metropolis in continuous expansion. According to the legend, it was founded in 753 B.C. by Romulus and Remus on seven hills among which flows the Tevere (ancient Tiber). The capital of the Roman kings and later of the republic, it became the center of the antique world after Roman troops conquered all the lands overlooking the Mediterranean sea. Later on, it became the seat of papacy. In 476, the City was besieged by Barbarian troops and the emperor Romulus Augustulus was dethroned. Although the political influence of Rome started to decline earlier, this event is conventionally considered to put an end to antiquity. Rome entered the so-called middle ages, becoming again a brilliant center of arts and culture during the Renaissance (16th cent.). The medieval city was deeply transformed with luxurious palaces of noble families, churches with a triumphant architecture, and large public places with fountains, colonnades, and mythological sculptures resuscitating the art of antiquity.

Rome is a vast city, but the historic center is quite small. Most of the major sights are within a reasonable distance of the central railway station, Stazione Termini. It is, for instance, possible to walk from the Coliseum, through the Forum, up to Piazza di Spagna and across to the Vatican in one day. The Palatine Hill and the Forum are the center of ancient Rome. Via del Corso runs north from the Forum to Piazza del Popolo, with the Spanish Steps and the Trevi Fountain just to its east. The Vatican is northwest of the Forum, across the River Tiber.

Italians are welcoming and extremely skilled in making foreigners feeling comfortable whatever language they speak. However, English is more and more diffused, especially among the younger generation. Similarly, newspapers in different languages are available daily and bookshops with an international department are more and more numerous.

Rome's activities (apart from the mandatory sight-seeing) usually involve nothing more strenuous than eating, drinking, and listening to good music. They include some characteristic rituals: a break for one or more coffee(s)/espresso quickly swallowed standing in a bar and chatting with other customers. For lunch, a slice of pizza, or a light and quick meal (a "pasta") in a small restaurant (trattoria) or a bar, again chatting with other customers. At the end of the day, particularly during spring or summer, on the way back home, a stop to eat a delicious ice cream (gelato) at a terrace.

Conversations are animated, also involving hand gestures. Though no subject is taboo--politics and politicians are the main topics and the object of harsh criticisms. But, even if the conversation is animated, sense of humor never disappears. During the weekend, however, conversations change object: soccer becomes the priority apart for the happy ones who decide to take their swimming suit and go to the beach, forgetting everything and enjoying the Mediterranean.

Crowds are fertile territory for pickpockets anywhere, and Rome can be crowded, especially on the bus or subway. Beggars (often characterized as 'Gypsies') are a problem. We'd give a wide berth and take a confident stride away from any urchins beseeching you for money - the only donation they want is your wallet. Keep purses and camera bags on the building side, and away from the curb to avoid being snatched by someone on a scooter. As with most major cities, it's wise to safeguard property and to take simple precautions. Don't wear expensive-looking jewelry or leave possessions unguarded and stay alert in crowded areas. Also, keep in mind that it is not advantageous to blatantly look like a tourist. Remember the saying "when in Rome"!

Although most of Rome's sights are in a relatively circumscribed area, the city is too large to be seen solely on foot. Take the Metro (subway), a bus, or a taxi to the area you plan to visit, and expect to do a lot of walking once you're there. Wear a pair of comfortable, sturdy shoes to cushion the impact of the *sampietrini* (cobblestones).

Rome's integrated Metrobus transportation system includes buses and trams (ATAC), Metro and suburban trains and buses (COTRAL), and some other suburban trains run by the state railways (FS). A ticket valid for 75 minutes on any combination of buses and trams and one entrance to the Metro costs €1. You are supposed to date-stamp your ticket when you board the first vehicle, stamping it again when boarding for the last time within 75 minutes (the important thing is to stamp it the first time). As well, you must validate your train ticket before boarding, in one of the yellow machines scattered along the tracks. Don't forget to do so, in case you are planning to reach the rendezvous place by train, from the airport!

Tickets are sold at tobacconists, newsstands, some coffee bars, automatic ticket machines positioned in Metro stations and some bus stops, at ATAC and COTRAL ticket booths (in some Metro stations, on the lower concourse at Stazione Termini, and at a few main bus terminals). A BIG tourist ticket, valid for one day on all public transport, costs €4.00. A weekly ticket (*Settimanale*, also known as CIS) costs €16.00 and can be purchased only at ATAC booths.

Banks are open weekdays 8:30 am to 1:30 pm and 2:45 to 3:45 pm. Post offices are open Monday-Saturday 9:00 am – 2:00 pm; central and main district post offices stay open until 6:00 pm weekdays, 9:00 am – 2:00 pm on Saturday. On the last day of the month all post offices close at midday.

9. TRAVEL PLANNING

Visa Information

Unless they wish to stay for a longer period than the Earthwatch project and for other purposes than tourism, volunteers of the US, EU, Australia and Japan do not need a tourist visa for entry. Citizens of other countries should check with their travel agent or a visa agency for specific visa and entry requirements. A useful website for visa requirements is:
http://www.embassyworld.com

Here are some Frequently Asked Questions about visas:

What kind of visa do I need?

Earthwatch volunteers, who require a visa for entrance, will need a tourist visa. The Principal Investigator/researcher will have the research permit or permission for the project.

How do I obtain a visa?

You can obtain a tourist visa by contacting the Embassy or Consulate of the country to which you are traveling. If you choose to obtain a tourist visa by directly contacting the country's embassy, please be sure to leave plenty of time, at least 6 weeks. If you have less than 6 weeks or wish to save yourself trouble, we strongly recommend using a visa agency, which can both expedite and simplify the process. The average cost of a visa is approximately US$40--$100 but varies country to country and can potentially cost up to US$180. A visa agency will charge an additional fee (depending on the amount of time it takes to process the application), which you can inquire about directly.

What information do I need to provide?

You will need to send your passport, an application form, 2 to 4 passport-size photos plus payment to the embassy or visa agency (if applicable) at least 6 weeks in advance of departure. Please be sure that your passport is valid for at least 6 months beyond your stay.

What do I write on the visa application form as the "purpose of my visit?"

The purpose of your visit is for vacation, holiday, or travel. Foreign immigration officials do not always understand the concept of a "working vacation" or even "volunteering." Words such as "working/volunteering," "research" or a "scientific expedition" can raise questions concerning the country's foreign labor laws and/or prompt questions about official scientific research permits and credentials, etc. to which volunteers on their own will not be equipped to respond. All required research permits for the project are in place and have been approved by the proper authorities.

What do I write on the immigration form as the "purpose of my visit?"

The purpose of your visit is vacation, holiday, or travel.

What should I write for the place where I will be residing?

List the address of the hotel or project accommodations where you will be staying.

Where can I find more information on visas?

Please see "Helpful Resources" for several web site links related to the visa process.

Visa Agencies

IN THE UNITED STATES

Passport Visa Express.com
1911 North Fort Myer Drive, Suite 503
Arlington, VA 22209
Tel: 888 596-6028, +1 703 351-0992
Fax: +1 703 351-0995
Email: info@passportvisaexpress.com
Website: http://www.passportvisaexpress.com/

IN EUROPE

The Visaservice
Tel: +44 (0) 20 7833 2709
Fax: +44 (0) 20 7833 1857
Website: http://www.visaservice.co.uk

Thames Consular Services Ltd
Tel: +44 (0)20 8995 2492
Fax: +44 (0)20 8742 1285
Website: http://www.visapassport.com

Travel Agencies

The following agency is familiar with Earthwatch projects and can assist you in making travel arrangements and booking hotels:

FOR US VOLUNTEERS

Please call your Expedition Coordinator to inquire about recommended travel agents for your project.

FOR EUROPEAN VOLUNTEERS

Wexas International
London, UK
Tel: +44 (0) 20 7581 8761
Fax: +44 (0) 20 7581 7679
Email: southern@wexas.com
Quote code: EWE01/02

STA Travel
Oxford, UK
Tel: +44 (0) 1865 792800
Fax: +44 (0) 1865 792911
Email: manager.oxford@statravel.co.uk
Quote code: EWE01/02

For discounted student and youth fares, we recommend the following agencies which specialize in student discounts:

STA Travel
U.S.: 800 781-4040
U.K.: +44 (0) 1865 792800
Website: http://www.statravel.com

FOR AUSTRALIAN VOLUNTEERS

The recommended travel agent is familiar with Earthwatch projects, is in contact with the Australian Earthwatch coordinators and gives a discount where possible to Earthwatch volunteers. She is able to organise travel and travel insurance for volunteers Australia-wide.

Carlene Harlock
Shop 2, 250 Flinders Street
Melbourne, Vic 3000
Tel: +03 9663 6266
Fax: +03 9663 5100
Email: carlene_harlock.vic@flightcentre.com

If you notify your Earthwatch Coordinator prior to contacting this travel agent, your rendezvous information will be forwarded.

Cancellation Insurance

We highly recommend trip cancellation insurance which will help cover your airfare if you are unable to travel, or the expedition is cancelled. Earthwatch does not reimburse airfare or costs associated with cancelled flights. Contact your nearest Earthwatch office for details on cancellation insurance.

Other Advice / Information

- *Local Currency:* Euro
- *Electricity:* 230V, 50Hz. Standard European plug.
- *Time Zone:* GMT/UTC +2
- *Additional Information:* It is advisable to have changed some local currency in Euros before leaving your country because banks in Italy are closed on Sunday.

Volunteers Under 18 Years of Age

This project is not suitable for volunteers under 18 years of age as readers must be at least 18 years old to be admitted to the Rare Books Room of the National Library of Rome, where most of the work will be done.

10. ITINERARY

Days	Morning	Afternoon	Evening
Day 1	Arrival, recovery from travel, informal welcoming meeting		
Day 2	Workshop	Orientation in Rome	
Day 3	Library research	Library research	
Day 4	Library research	Library research	Free evening
Day 5	Library research	Short visit	
Day 6	Library research	Library research	
Day 7	All day free		
Day 8	All day free		
Day 9	Library research	Library research	
Day 10	Library research	Short visit	
Day 11	Library research	Library research	Free evening
Day 12	Ostia Antica (all day)		
Day 13	Ostia Antica (all day)		Farewell dinner
Day 14	Final workshop	Shopping, packing	
Day 15	Departure		

During the Wednesday evenings, days off, and the Saturday evening before departure volunteers are free to socialize and explore by themselves. Though accommodation is included, meals are not covered. Of course, the PI and staff can advise and suggest possible itineraries.

The first full weekend (Saturday and Sunday) of the team will be free. Accommodation is included in the project cost, but other activities and meals are not. Documentation about visits, museums, and other tourist activities (including the *Lonely Planet* guide or, for example, Alan Epstein's *Do as the Romans do*) will be with the PI. Volunteers could also rent a bike near the Porta Pinciana in the Villa Borghese, to visit the gardens and the historic district of Rome (closed to traffic on Sunday, but not to bikes!).Villa Doria Pamphili, 2 km (1.3 mi) south of the Vatican, is the largest park in Rome and a lovely spot for a stroll or a picnic. And don't forget your bathing suit, in case you prefer to spend the free day at the beach, less than 15 miles, and accessible by metro!

A ride in a horse-drawn carriage can be fun when traffic is light, especially on a Sunday or holiday or during the summer. Agree on a price with the driver before starting out. City-regulated rates are about €30 for a 30-minute ride and about €50 for an hour. You can find carriages at Piazza di Spagna, Piazza Venezia, and on Via del Corso near the Hotel Plaza. Another option is to plan a weekend visit to Pompeii. The project staff can help you plan this trip.

It is requested volunteers who may be meeting non-team members only do this during the free Wednesday evening or on your free weekend and not during the course of project activities.

Volunteers should consult a travel guidebook for information on local attractions. See "Helpful Resources."

11. DAILY SCHEDULE

Volunteers should be aware that schedules can and do fluctuate. Weather and work conditions can affect the daily schedule. Should this situation arise, your cooperation and understanding are appreciated.

Time	**Activity**
	Wake up
by 8:30	Breakfast
8:30 - 9:00	Go to the library
9:00 - 12:15 pm	Library research, with a break in the morning
12:15 - 1:15 pm	Lunch and relax
1:15 - 5:15 pm	Library research, with a break in the afternoon
5:15-5:45 pm	Meeting for questions, current status of work
5:45 - 7:45pm	Return to accommodation, free time
7:45 - 9:00 pm	Dinner
9:00 pm	Free time

Earthwatch asks that all volunteers respect the work schedule of the project staff. Please do not be tardy or skip activities in order to experience other aspects of Rome. Wednesday evening and the free weekend are your opportunities to explore Rome as you wish. The project staff are happy to give any advice about how or where to spend your free time.

12. TEAM DEVELOPMENT

Extra work experiences will contribute to develop a convivial ambiance since the very first day of the team. At the beginning of the stay, volunteers will receive a T-shirt specially designed for the project. This token will contribute to create the identity of the group and the feeling of affiliation to the project, also remaining as a memory of the moments of work, fun, and common experiences. During the scouting tour of the first day, volunteers will be informed about the main points of orientation in Rome, including monuments, fountains, belvederes, or other peculiarities allowing volunteers to share personal feelings. They will receive a set of documentation including a map, basic information, and the location of strategic places.

Similarly, in daily life, when in Rome, do as the Romans do. Volunteers will live a two-week experience of another rhythm, other odors, tastes and food, and also other music and noises that will contribute to the cohesion of the group. On the way to the library, for example, the group could stop to have a coffee and, on the way back or during the evening, the group or some

volunteers could eat an ice cream, a granita, or a tiramisù (a pastry). Meals taken together will also be a moment of contact. In the evening, a movie, reading an Italian journal together trying to guess the meaning of the titles or playing cards will be other fun experiences contributing to create a particular ambiance.

One of the great joys of a meal in Rome is that most restaurants will not rush you out. Service is relaxed and the bill (*il conto*) will not be brought until you ask for it. Almost all restaurants close one day a week (in most cases Sunday or Monday). There was a time when you could predict the clientele and prices of a Roman eating establishment by whether it was called a *ristorante* (restaurant), a *trattoria*, or an *osteria* (tavern). These names have since become interchangeable. A rustic-looking spot that calls itself an *osteria* may turn out to be chic and anything but cheap. Generally speaking, however, a *trattoria* is a family-run place, simpler in decor, cuisine, and service - and slightly less expensive - than a *ristorante*.

A traditional Roman meal usually begins with an *antipasto*: cold meats, raw vegetables soaked in olive oil or vinegar, and olives. Among the fresh cheeses, ricottas and mozzarellas. Then, comes the first course (usually a pasta): *spaghetti carbonara* style, *bucatini* (a type of pasta) *alla matriciana* (tomato, bacon and onion), *penne all'arrabbiata* (tomato, parsley, and peppers), *gnocchi alla romana*, spaghetti with garlic and oil, *fettuccine* with butter or tomato sauce. Also traditional are country soups like pasta with beans, or with chickpeas or lentils, or potato *gnocchi* with tomato sauce. The second course can be meat or fish. As dessert, fruit in season or fruit cocktail, ice cream.

13. ACCOMMODATIONS

Volunteers will stay in shared rooms in a modern and simple bed and breakfast located within walking distance of the library and close to the Metro station "Cavour" (Line B). Volunteers will have breakfast at the B&B, before going to the library. Lunches and dinners will be taken together during the week.

Volunteers will receive literature on Rome upon arrival (its museums and monuments, churches and sanctuaries, restaurants and bars, theaters and other places such as Internet centers, laundry, bookshops, etc).

During the weekend volunteers will be free to choose activities and restaurants according to their preferences while continuing to stay at the B&B.

All rooms have a small bathroom (with shower), TV, and air-conditioning and will be shared by two volunteers when possible. Accommodations have twin beds and bedding is provided. Couples may be accommodated in a separate room according to the number and gender of participants to the teams.

The B&B, located at the 5th floor of a nice, traditional, recently restored Roman palace (with elevator) and is equipped with a small fridge at the disposal of the guests.

The electrical current in Italy is 220 V, 50 Hz alternating current (AC); wall outlets take Continental-type plugs with two round prongs. To use U.S.-purchased electric powered equipment, you'll need a voltage converter and an adapter plug. If your appliances are dual-voltage, you'll only need an adapter. (Most laptops operate equally well on 110 and 220 volts and so require only an adapter.). Don't use 110-volt outlets, marked "For Shavers Only," for high-wattage appliances such as blow-dryers.

A laundry service (coin-operated machines) is located at short distance from the accommodation.

For personal communications, you will be able to check your email in the internet centers in the city (one is just beside the accommodation).

14. FOOD

No other city than Rome brings together such sights and experiences so intimately. If you think you know Italian food but haven't eaten in Italy, you're in for a glorious treat. Food is the number 2 Roman attraction! It will contribute to make the stay enjoyable, all the more because volunteers, staff members and Principal Investigator will take meals together.

A light breakfast is included in the accommodation. While working at the library, lunch will be taken at a self service close to the library, in a smoke-free environment. There are three menus, from a light lunch (menu A: with a salad, a cold pasta or a similar dish) to a two courses meal (menu C: a first salad, for example, followed by a warm meat or fish dish), including an intermediate meal (menu B: a warm plate). In all cases, there is a wide choice of fresh and delicious, though simple, food with a great variety over the week. Dinners will be taken to "Il Ragno d'Oro" (Golden Spider), a typical Roman trattoria very close to the accommodation. Volunteers will choose their own food among the many menus of the trattoria, from a one-course large pizza or abundant pasta to a two-course dinner, plus dessert.

Volunteers will be responsible for covering the costs of meals on Wednesday evenings, the free weekend, and the dinner on the Saturday night before departure.

Roman cooking is predominantly simple; dishes rarely have more than a few ingredients, and meat and fish are most often baked or grilled. The typical Roman fresh pasta is fettuccine, golden egg noodles at their best with *ragù,* a rich tomato and meat sauce. Spaghetti *alla carbonara* is tossed with a sauce of egg yolk, *guanciale* (cured pork cheek), *pecorino Romano* cheese, and lots of black pepper. Pasta *all'amatriciana* has a sauce of tomato, *guanciale*, *pecorino*, and pepper. *Potato gnocchi*, served with tomato sauce and a sprinkling of Parmesan or *pecorino* are a Roman favorite for Thursday dinner.

The best meat on the menu is often *abbacchio* (milk-fed lamb). Legs are usually roasted with rosemary and potatoes, chops are grilled *a scottadito* (eaten hot off the grill with your hands). Light Mediterranean fish such as *spigola* (sea bass), *triglia* (red mullet), and *rombo* (turbot or flounder) are other menu regulars.

Vegetables do not constitute a main ingredient of meals, but a side-dish. Their variety depends on the season and is generally limited to *cicoria*, *spinaci* and *bieta*, and/or a mixed salad (including lettuce, tomato and cucumber). Broccoli or mashed potatoes, for instance, are not commonly served in restaurants.

Local cheeses are made from sheep's milk; the best known is the aged, sharp *pecorino Romano*. Fresh *ricotta* is a treat all its own.

Volunteers will live a personal experience of the so-called Mediterranean diet, with a better knowledge of its historical background. Living like a native Italian makes for a memorable experience, but Volunteers will never blend in if they are caught making a faux pas. Cappuccino is only a breakfast drink and should not be ordered after 11:00 am or, if ordered, it will provoke a

certain reaction of surprise! In addition, cheese accompanies only selected pastas (for example, those with meat) and should not be added to pastas with seafood or fish!

Here is a sampling of the foods you might expect in the field. Please bear in mind that variety depends on availability. This list is intended to provide a general idea of food types. It is very important that volunteers be flexible.

Breakfast:	While breakfast is an important meal to most Americans, it is less so for southern Europeans, particularly Italians. Fruit juices, a carafe of coffee (or tea), usually with milk (*caffe latte*), and bread with jam, though croissants are common; as a rule no eggs or bacon.
Lunch:	During research days, lunches will include a great variety of salads, cold pasta, ham and fresh cheese (mozzarella), pastas and warm meat or fish dishes. During the days in Ostia Antica, volunteers will have a brown-bag lunch (one or two sandwiches to be chosen at a bar close to the B&B, and water and fruit) It will also be possible to stop to have a soda, a coffee, an ice cream or a slice of watermelon.
Dinner:	Dinner could include two courses and a dessert. The first course will be a pasta, a soup, or a variety of typical products. The main course will be made of meat or fish. Pizza is always in the menu ("pepperoni" in Italian means "peppers". Volunteers should ask for "salame piccante" if they wish a "pepperoni pizza" in Italy). Fried food stuffs are typical of Roman cuisine. Volunteers can expect to have fried fish or vegetables, for example (like *fiori di zucca*). A salad and a dessert (or fresh fruit) will conclude the meal.
Beverages:	Water and sodas will be offered with the meal. However, wine and beer can be ordered by volunteers at their own expenses.

Special Dietary Requirements

Accommodating any special diets is not guaranteed and can be very difficult due to availability, location, and local conditions. It is often difficult to accommodate strict vegetarians and vegans. It may be possible to get meatless meals but vegans and strict vegetarians may have a problem avoiding animal products altogether.

Questions about the ingredients and recipes create some trouble: waiters are not necessarily aware of all the secrets of the chef and thus have to return to the kitchen, creating confusion and delay in the service.

If diet poses a problem or if special requirements are to be strictly met, then participation on this Earthwatch expedition should be seriously reconsidered.

15. PHYSICAL CONDITIONING

Please show this section to your physician when he/she is completing your health statement.

To the examining physician:

Your patient has volunteered to join the field research team which has specific physical demands of which you and your patient should be aware. **We need your accurate evaluation of your patient's ability to meet the conditions detailed below in order to safeguard his/her health and safety, and ensure that s/he can participate fully and effectively.**

Overview

No special physical conditioning is required. Volunteers will be invited to go walking to the National Library and other sites to have more opportunities to discover Rome and enjoy its local flavor. This will also prevent the possibility to be victims of pickpockets. Use of public means of transportation will be possible however since the Metro stop is just around the corner.

General Conditions

Humidity	49%	to	64%
Temperature Range:	60F/11°C	to	100°F/°40 C
Altitude	0	to	30 ft./100 m
Rainfall	2 in/5 cm	per	month

There is basically NO rainy season, however October can be the wettest time of year. As an example, last year it did not rain in Rome between April 21 and early-October! Rome can be not only extremely hot, but also very polluted and dusty.

Climate and terrain of the research site

Located at 23 km (15 miles) from the Mediterranean Sea, Rome is surrounded by a countryside characterized by the umbrella pine with its large frond, low and twisted olive trees, grape vines cultivation and Renaissance mansions on the slopes of the hills. Late Spring (May and June) and late Summer (September) are enjoyable with temperatures in the 80's^{o}F/25-30^{o}C, while October is particularly mild with spectacular sunsets. During these periods, weather is dry, normally without rain. July and August can be very hot.

Physical Demands

	Workload/Intensity	**Time (hours per day)/#of days per team**
Sitting		7hours/5days
Bending		
Hiking		
Walking		1 hour/per day
Carrying		
Swimming		

Medical Conditions of Special Concern

Library research could be difficult for volunteers with impaired sight or hearing. Long hours seated at work on old style (monastic) wooden chairs can be physically demanding for people with spine problems.

For work outside, volunteers with a low tolerance to high temperature and exposure would find this project challenging.

For free time, a good capacity of walking is a real plus to enjoy the city. Very few trains of the Metro have an A/C system and are usually pretty crowded. Wheelchairs cannot be accommodated at the B&B. Most Metro stations are not equipped with special access. Not to mention the cobblestones streets and sidewalks.

Proximity to medical care

Is there a physician, nurse, or EMT on staff? No

Staff certified in CPR (Cardiopulmonary Resuscitation), First Aid, or other safety training (i.e. Wilderness First Response, Water Safety, etc.)? No

What is the nearest hospital location? 2 hospitals located 3 miles/5 km away.

S. Giovanni Hospital
8, via dell'Amba Aradam
00184 Rome
Tel: + 39 06 77 051

S. Spirito Hospital
1, Lgo Tevere Sassia
00 193 Rome
Tel: + 39 06 68 351

Time to reach? According to traffic, from 10 to 30 minutes.

16. MEDICAL ADVICE

Inoculations

The following are recommendations only. Health conditions around the world are constantly changing, so keep informed and consult your local travel health clinic, the U. S. Center for Disease Control (www.cdc.gov) or the World Health Organization (www.who.org) websites. Medical decisions are the responsibility of each volunteer. Please consult your physician, your local Public Health Department, or the resources listed below for the latest health information for travelers.

No vaccines are required. Volunteers with special medical treatments should bring their own medicines and possibly also prescriptions. Spare glasses would be advisable.

	Required for Entry	Recommended for Health Reasons
Polio		
Tetanus		**X**
Typhoid		
Yellow Fever		
Hepatitis A		

Is Malaria present at the research site? No

Tuberculosis (TB): The World Health Organization (WHO) estimates that one third of the world's population is infected with the bacterium (*M.tuberculosis*) that causes tuberculosis (TB). Incidence of tuberculosis is higher in developing countries, particularly in Asia, Africa, the Caribbean and Latin America. In general, approximately 10% of persons infected with *M. tuberculosis* are at risk for developing active TB during their lifetimes. TB is considered highly treatable with medications that are of relatively low toxicity and cost. Volunteers returning from developing countries are encouraged to have a (PPD)-tuberculin skin-test to screen for potential infection.

These recommendations are for this project site only. Please consult your physician for guidance on inoculations if you intend to travel to other parts of the country.

Resources

Earthwatch recommends that you consult your local public health department or one of the following resources for the latest health information for travelers.

US ONLY

Centers for Disease Control
Atlanta, GA, U.S.A.
Phone: 800 311-3435 or 888 232-3228
Website: http://www.cdc.gov

UK ONLY

Hospital for Tropical Diseases Healthline
Phone: 0906 1 337733 (within UK)
(calls are charged at 50p per minute)

MASTA Travelers' Healthline
Phone: 0906 8 224100 (within UK)

AUSTRALIA ONLY

The Travel Doctor – clinics Australia wide
Travel Doctor Hotline: 1300 658 844 (within AU)
Website: http://www.tmvc.com.au

GENERAL INFORMATION

Disease Outbreaks:
http://www.who.int/disease-outbreak-news/
or
http://www.istm.org/news.html

17. EMERGENCIES IN THE FIELD

Minor injuries occurring at the library will be treated in the local clinic. Major injuries requiring medical assistance will be treated in the nearest hospital, to be reached by cab or ambulance, accordingly. If an injury occurs during a field trip, volunteers will be taken to the nearest medical facility for initial treatment and then transferred to a hospital closer to our accommodations if need be.

Emergency contact number at Earthwatch headquarters in the U.S.: +1 978 461-0081.

After business hours, leave your message with our answering service. State that you have an emergency communication and leave a clear message with the name of the expedition, your name, location you are calling from, and if possible, a phone number where you can be reached. An Earthwatch staff person will be paged and will respond to your call.

International Evacuation Insurance

UNITED STATES OFFICE:

The travel medical and evacuation insurance, coordinated by ISIS Assistance, is mandatory for all Earthwatch volunteers while they are on an Earthwatch expedition anywhere in the world. The insurance covers volunteer travel medical risk, including medical expenses and medical evacuation, while you are traveling with Earthwatch overseas or on an expedition within your home country. ISIS Assistance will also facilitate evacuation from the project site in the event of an emergency. Without insurance, the costs of such measures can be on the order of US$20,000 to $50,000.

A detailed description of the Earthwatch Volunteer Travel Medical Insurance Program policy will be sent with this briefing. The policy is summarized in a user-friendly questions answer format. Please contact your Expedition Coordinator if you have further questions.

Earthwatch Institute's insurance provider, ISIS Assistance, provides a 24-hour emergency hotline for the use of insured persons under the Earthwatch program. ISIS Assistance can help with medical emergencies, doctor and hospital selection, obtaining additional medical options, or medical translation problems. ISIS Assistance is backed by International SOS and Global Medical Management, who provide emergency medical evacuation and rescue services. The Earthwatch policy certificate number is US 011300. In addition, each individual policy is identified by the volunteer's Earthwatch ID number, shown above your name on your team list.

In an emergency - If you are calling from **outside of the US**, the number to call is: +44 (20) 8762 8015. You may call this number collect.

In an emergency - If you are calling from **inside the US,** the toll-free number to call is: 888 422-4747.

Basic coverage is valid in the country of your Earthwatch expedition, and during international travel to and from your expedition. For volunteers on Earthwatch expeditions in their own country, coverage begins when your group forms for the expedition, and ends when the group disbands. Options are available for volunteers who would like to extend the period of coverage, increase insurance amounts or purchase additional cancellation or baggage insurance.

EUROPEAN OFFICE:

Earthwatch Europe offers travel and medical insurance provided by Royal & SunAlliance. In the event of medical assistance or an evacuation being necessary, ISIS Assistance will be notified. ISIS Assistance will coordinate the evacuation in conjunction with International SOS.

FOR ALL OTHER VOLUNTEERS:

In addition, our affiliate offices in the Australia and Japan have recommendations for their volunteers. Please contact your nearest Earthwatch office for more information. You may also try the following website which lists several travel insurance providers. Click on the "Travel Insurance" link, which is located on the right in a box called "Healthy Travel Store" (just under the Visa sign). Website: http://www.travelhealth.com/home/

18. WHAT TO BRING

Note: Do not bring more luggage than you can carry and handle on your own. We recommend that you pack a carry-on bag with an extra set of field clothing and personal essentials in the event that your luggage is lost and/or takes several days to catch up with you.

Volunteers should take into account that they will share the bedroom, therefore storage space will have to be shared as well.

General Considerations

No specific equipment is required. Volunteers should be aware that there are pick-pockets in Rome as in any other large city, so it is advised that they not dress provocatively or show large sums of money, expensive jewelry, or electronics.

For research at the library, volunteers should have normal city clothes according to the climate. There is light air conditioning and temperatures within the library are pleasant: reading rooms open on central courtyards and are not exposed to the sun. Should they wish, Volunteers can bring a small inflatable cushion to be used in the library since chairs still are those of the old reading room.

For archeological work, sneakers and casual dress (long pants) are strongly recommended. Socks are useful to avoid weed allergy. Do not forget a hat. A small backpack will be useful, but is not indispensable.

Volunteers wishing to go to the sea should bring a swimming suit and a towel.

Cultural Considerations

When visiting churches in Rome during the free time, volunteers are requested to dress properly. (no shorts). Women should go inside with their shoulders covered.

Required

Clothing/Footwear for Fieldwork

- Light weight, quick drying, long-sleeved shirts and pants/trousers
- Well worn in and comfortable walking shoes, especially when visiting archaeological areas. High socks can be useful to avoid weeds, or insect bites.
- Hat

Clothing/Footwear for Leisure

- One nice set of clothing for evening in town or to keep clean for end of expedition
- Sneakers

Field Supplies

- Small daypack/rucksack
- Drybag or plastic sealable baggies (good for protecting equipment such as camera from dust, humidity, and water)
- Insect repellant spray
- Water bottles

Personal Supplies

- Personal toiletries (we recommend bringing biodegradable soaps and shampoos)
- Antibacterial wipes or lotion (good for "washing" hands while in the field)
- Personal first aid kit (anti-diarrhea pills, antibiotics, antiseptic, itch-relief, pain reliever, bandages, moleskin, etc.)
- Sunscreen lotion with SPF 30 or higher

Miscellaneous

- Spending money. A small amount of EUROS for the arrival is suggested (around €100, preferably NOT in one banknote!). Credit Cards are commonly accepted and US$ can easily be changed. ATMs are common in Rome.
- Camera, film, extra camera battery
- Magnifying lens (always useful for books written in small characters)
- Mechanic pencils, if you don't want to use the traditional pencils provided.

- Electricity converter
- Seat cushion

Recommended:

- Duct tape (always handy!)
- Books, cards and a good tourist book guide.

19. HELPFUL RESOURCES

- Alain Touwaide's website: http://persoon.si.edu/staff/makepage.cfm?thisName=Touwaide
- Tourist House website: http://www.touristhouse.it
- Timetable train Airport Fiumicino/Termini Station and Termini Station/Fiumicino: http://www.romeguide.it/FILES/TRAINS/fco.htm
- Website National Library of Rome: http://www.bncrm.librari.beniculturali.it/eng/pages/argomento.htm
- Ostia Antica website: http://www.ostia-antica.org/
- http//www.itnw.roma.it/ostia/scavi
- Map of metro system in Rome (pluri-lingual): http://www.metropla.net/eu/rom/roma.htm
- Useful Visa Information website: http://www.embassyworld.com
- Airport Codes Worldwide: http://www.logisticsworld.com/airports.asp
- Lonely Planet travel guidebooks and online travel site: http://www.lonelyplanet.com. Their guidebooks can be purchased from their website.
- The Rough Guide travel guidebooks and online travel site: http://travel.roughguides.com/
- Cheap Flights: http://www.travelix.com/ or http://www.discountair.com/ (worldwide)
- Country Reports. Country information from around the world. Website: http://www.countryreports.org
- National Geographic Map Machine. Website: http://plasma.nationalgeographic.com/mapmachine
- U.S. Travel Clinic Directory: http://www.astmh.org/scripts/clinindex.asp

- Travel Health website: http://www.mdtravelhealth.com is a resource for healthy travel. Covers country-specific risks and diseases, suggested immunizations, and health recommendation, and locating a travel clinic near you.
- U.S. State Department: http://www.state.gov/
- UK Foreign Office travel advice: http://www.fco.gov.uk/travel
- World Time Server: http://www.worldtimeserver.com/ [time worldwide with GMT/UTC] or http://worldbuddy.com/ or http://www.hilink.com.au/times/
- Currency Converter: http://www.xe.com/ucc/
- Telephone Dialing From and To Anywhere: http://kropla.com/dialcode.htm
- Online Unit Conversions: http://www.onlineconversion.com/
- Worldwide Weather: http://www.worldweather.com/ or http://www.wunderground.com
- ATM Locator:
  http://visaatm.infonow.net/bin/findNow?CLIENT_ID=VISA
  http://www.mastercard.com/atmlocator/index.jsp
- Heat Index (temperature, dewpoint and relative humidity):
  http://www.weatherimages.org/data/heatindex.html
- Exhaustive List of Weather Resources:
  http://cirrus.sprl.umich.edu/wxnet/servers.html

20. THE READING LIST

Volunteers are requested to be familiar with the topics of the research by reading and consulting the items below.

1. Some ancient medical and therapeutic texts:

G.E.R. Lloyd et al., 1950, *Hippocratic writings*, London: Penguin Books (extracts).

A.F. Hort, ed., 1916, *Theophrastus, Enquiry into plants*, 2 vols., London: W. Heinemann, Cambridge Mass.: Cambridge University Press (book 9).

T.A. Osbaldeston, R.P.A. Wood, 2000, *Dioscorides De materia medica.Being an herbal with many other medicinal materials. Written in Greek in the first century of the common era. A new indexed version in modern English*, Johannesburg: IBIDIS Press (extracts).

H. Rackham, ed., 1938-63, *Pliny, Natural History*, 10 vols., Cambridge, Mass.: Harvard University Press (extracts).

2. Ancient pharmacology:

G.E.R. Lloyd, 1983, *Science, folkore and ideology*, Cambridge: Cambridge University Press, pp. 112-200: Developments in pharmacology, anatomy and gynecology.

A. Touwaide, 1998, Therapeutic strategies: drugs', in *Western Medical Thought from Antiquity to the Middle Ages*, M.D. Grmek, ed., Cambridge Mass.: Harvard University Press, 259-272, 390-394.

3. Renaissance botany and pharmacology:

A. Arber, 1986, *Herbals: their origin and evolution. A chapter in the history of botany 1470-1670*. Third edition with an introduction and annotations by W.T. Stearn, Cambridge: Cambridge University Press (extracts).

4. Renaissance printing:

J. Brotton, 2000, 'Printing the world', in *Books and the sciences in history*, M. Frasca-Spada, N. Jardine, eds., Cambridge: Cambridge University Press, 35-48.

R. McKitterich, 2000, 'Books and sciences before print', in *Books and the sciences in history*, M. Frasca-Spada, N. Jardine, eds., Cambridge: Cambridge University Press, 13-34.

5. Renaissance scientific illustrations (particularly botanical):

S. Kusukawa, 2000, 'Illustrating nature', in *Books and the sciences in history*, M. Frasca-Spada, N. Jardine, eds., Cambridge: Cambridge University Press, 90-113.

6. Integration of data from ancient texts into current research:

J.M. Riddle, 1996, 'The medicines of Greco-Roman antiquity as a source of medicines for today', in *Prospecting for drugs in ancient and medieval European texts. A scientific approach*, B. K. Holland, ed., Amsterdam: Harwood Academic Publishers, 7-17

7. Ancient books:

http://memebers.tripod.com/~papyri/links/books.html. This site contains a lot of information on ancient books, the history or printing, illustration form ancient books, etc.

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