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Strengthening the Biological Weapons Convention

Briefing Paper No 18 (Second Series)

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RAISING AWARENESS: A HIPPOCRATIC OATH FOR LIFE SCIENTISTS

Malcolm R. Dando and James Revill[†]

Introduction

1. In June 2005 the Meeting of Experts of the States Parties to the Biological and Toxins Weapons Convention (BTWC) met to “*discuss and promote common understanding and effective action on:*

The content, promulgation, and adoption of codes of conduct for scientists.”¹

The discussions, which included contributions from “twenty three scientific, professional, academic and industry bodies”², proved useful in generating greater understanding of the issues related to codes of conduct and concluded on the 24 June 1995 with *inter alia* a general acceptance of the need to raise awareness. The Secretariat’s press release³ stated:

“...Many experts agreed on the general need to raise awareness and increase education amongst the scientific community and the public at large on biological weapons issues...”

The Final Report⁴ (BWC/MSP/2005/MX/3) of the Meeting of Experts issued on 5 August 2005 included as an Annex a paper prepared by the Chairman setting out the considerations, lessons, perspectives, recommendations, conclusions and proposals drawn from the presentations, statements, working papers and interventions at the meeting. The need to raise awareness runs through many of these points.

2. Thus in a presentation by the United States it was argued⁵ that “A code would raise awareness among scientists of the BWC, its obligations, and the dual-use nature of the life sciences”. The UK stated⁶ that “One key result of the seminars was a realisation of the need to raise awareness of the BTWC and relevant legislation so that practising scientists were aware of the prohibitions and could consider any implications for themselves or their work”.

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¹ United Nations, Fifth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxins Weapons and on their Destruction, Geneva, 19 November – 7 December 2001 and 11 – 22 November 2002. *Final Document*, BWC/CONF.V/17, 2002. Available at: [http://www.opbw.org/rev_cons/5rc/docs/final_dec/BWC-CONF.V-17-\(final_doc\).pdf](http://www.opbw.org/rev_cons/5rc/docs/final_dec/BWC-CONF.V-17-(final_doc).pdf)

² Graham S. Pearson, *The Biological Weapons Convention Meeting of Experts*, The CBW Conventions Bulletin, Issue no 68, June 2005. Available at: <http://www.sussex.ac.uk/Units/spru/hsp/CBWC68.pdf>

³ United Nations, *Biological Weapons Convention Experts Meeting Concludes*, United Nations Press Release DC/2973, 24 June 2005. Available at: <http://www.opbw.org/>

⁴ United Nations, Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxins Weapons and on their Destruction, Geneva, Third Meeting, Geneva, 5-9 December 2005, Meeting of Experts, 13 -24 June 2005, *Report of the Meeting of Experts*, BWC/MSP/2005/MX/3, August 2005. Available at <http://www.opbw.org>

⁵ United States of America, *Presentations Submitted by the United States: 5. Developing an Acceptable Code: A Code of Ethics*, BWC/MSP/2005/MX/MISC.4, pp. 16-18, 28 June 2004. Available at: <http://www.opbw.org/>

⁶ United Kingdom, *Report of Seminars Organised by the Foreign and Commonwealth Office*, BWC/MSP/2005/MX/WP.16, 13 June 2005. Available at: <http://www.opbw.org/>

A Working paper submitted by the Islamic Republic of Iran stated⁷ “Raising [the] scientific community’s awareness in either state or private sectors with respect to the objectives enshrined in the BWC could be an important and effective element in promoting the national implementation of the Convention”. The Japanese delegation pointed out⁸ that “The code therefore raises scientists’ ethical awareness of risks inherent in their activities.... a certain deterrent effect is expected to be achieved if participants have increased the resultant awareness of the issue.”

3. As several other States Parties (see Table 1) agreed on the need to raise awareness in the scientific community, this is a probable area that could be identified for the promotion of ‘effective action’ related to the issue of codes of conduct at the forthcoming Meeting of States Parties in December 2005.

⁷ Islamic Republic of Iran, *The Content Promulgation and Adoption of Codes of Conduct for scientists*, BWC/MSP/2005/MX/WP.26, 20 June 2005. Available at: <http://www.opbw.org/>

⁸ Japan, *Codes of Conduct for scientists – discussions in Japan on the issue*, BWC/MSP/2005/MX/WP.21, 14 June 2005. Available at: <http://www.opbw.org/>

Table 1 – The Importance of Awareness Raising

State	Document reference ⁹	Statement
Germany	BWC/MSP/2005/MX/WP.12	A code of conduct for the life sciences could represent an effective element in preventing the hostile use of biological agent, if it is designed to <i>promote awareness</i> of the complex dual use dilemma.
India	BWC/MSP/2005/MX/WP.23	Scientists <i>should be made aware</i> of the potential risks and concerns relating to science and its wider applications and the ethical responsibilities they shoulder.
Indonesia	BWC/MSP/2005/MX/WP.26	<i>Raising scientific community's awareness</i> in either state or private sectors with respect to the objectives enshrined in the BWC could be an important and effective element in promoting the national implementation of the Convention.
Australia	BWC/MSP/2005/MX/WP.28	Certain themes or principles will recur frequently in codes designed to address the possibility of diversion to a weapons programme arising from the dual-use nature of biological sciences. These are:.... <i>Raising awareness</i> of the possibility amongst scientists, to ensure that they do not inadvertently assist in a biological weapons programme.
Italy	BWC/MSP/2005/MX/WP.34	Life scientists <i>must be constantly aware</i> of the fact that the extraordinary opportunities made available by the knowledge and technologies... may have dual use effects.
Republic of Korea	BWC/MSP/2005/MX/WP.33	<i>Recognition of individual responsibility</i> , and biosafety and biosecurity aspects are core elements for codes of conducts / codes of ethics.
US	BWC/MSP/2005/MX/MISC.4	<i>A code would raise awareness</i> among scientists of the BWC, its obligations, and the dual-use nature of the life sciences.
Islamic republic of Iran	BWC/MSP/2005/MX/WP.26	<i>Raising scientific community's awareness</i> in either state or private sectors with respect to the objectives enshrined in the BWC could be an important and effective element in promoting the national implementation of the Convention.
UK	BWC/MSP/2005/MX/WP.16	One key result of the seminars was a realisation of <i>the need to raise awareness</i> of the BTWC and relevant legislation so that practising scientists were aware of the prohibitions and could consider any implications for themselves or their work.
Japan	BWC/MSP/2005/MX/WP.21	The code <i>therefore raises scientists' ethical awareness</i> of risks inherent in their activities.... a certain deterrent effect is expected to be achieved if participants have increased the resultant awareness of the issue.

⁹ All documents available at <http://www.opbw.org/> [Emphases added]

4. This Briefing Paper examines how the States Parties could convert the agreement on the importance of awareness raising into effective action. The first section of the paper outlines some of the tools available to raise awareness. The second section uses a **study of oaths in the medical community** to expand on the value of an ethical code, in the form of an oath taken *en masse* at graduation ceremonies, in raising awareness. The third section identifies the key principles that could form the **content** of an oath and then proceeds to discuss elements that could contribute to the **promulgation** of an oath. Finally, the paper concludes with some suggestions concerning methods to encourage and ensure **adoption**. The central proposal put forward is that a Hippocratic style oath for life scientists could be an efficient and effective means of beginning to raise awareness of the dangers of dual-use research amongst the life science community and thus be a useful first step in an overall programme of code development and implementation.

Awareness raising tools

5. There are several means through which awareness levels can be developed, this paper, however, focuses on three: education, pre-project review boards and codes of conduct. In an ideal situation the problem of raising ethical awareness could be dealt with by the development and implementation of an ethical element in all life science-related educational courses. According to Willmott¹⁰, this is already being carried out in the UK to some extent with a reported 69% of undergraduate bioscience programmes including an ethical component, although Willmott notes that it may not be appropriate to extrapolate this figure nationally because of his limited data. Moreover, the focus of current bioethics programmes is likely to be primarily on reinforcing scientific integrity, specifically deterring ‘falsification’, ‘misleading results’ and theft of intellectual property, rather than on the issues surrounding dual-use research.

6. The existence of such ethics modules, however, provides a useful framework within which bioethics concerns, specifically those concerning the dual-use problem, could be integrated into academia in the UK. Should the States Parties to the BTWC successfully highlight the importance of raising awareness to prompt subsequent governmental action, then awareness raising could be successfully achieved without significant interference in current life sciences education. Rather, the modest extension of existing ‘ethical components’ to include some form of security orientated discussion on experiments such as Jackson *et al*’s¹¹ ‘Mousepox IL-4’ or Wein *et al*’s¹² ‘Botulinum in milk’ may be a useful contribution to raising awareness among life scientists of the current dual-use concerns.

7. A second means of raising awareness could be through the development and implementation of pre-project review systems that could include assessment of BTWC compliance in conjunction with a wider review of health and safety issues. This approach,

¹⁰ Christopher J. R. Willmott, *Teaching Ethics to Bioscience Students – A Survey of Undergraduate Provision*, Bioscience Education Electronic Journal, Volume 3 May 2004. Available at: <http://www.bioscience.heacademy.ac.uk/journal/vol3/Beej-3-9.pdf>

¹¹ For more details on this experiments see: Deborah Mackenzie, *US develops lethal new viruses*, ‘The New Scientist’, 29 October 2003. Available at: <http://www.newscientist.com/article.ns?id=dn4318>

¹² Deborah Mackenzie, *Milk supplies at risk from terrorist toxin*, ‘The New Scientist’, 29 June 2005. Available at: <http://www.newscientist.com/article.ns?id=dn7601>

varieties of which have been proposed in an earlier Briefing Paper¹³, by the Royal Society¹⁴ in the UK, and, in the US, by the National Academy of Sciences¹⁵ and Harris *et al*¹⁶ at the University of Maryland, would encourage scientists to consider the ramifications of any experiment prior to initiation, thus forcing scientists to demonstrate a degree of awareness.

8. In addition, codes of conduct could function as a useful means of raising awareness of both the existence of the BTWC and the dangers of dual-use research. Moreover, an interest in some form of code is increasingly evident both within the biological arms control community and in the wider context. Certainly, Nobel peace prize winner and nuclear physicist Sir Joseph Rotblat has stated: “the time has come to formulate guidelines for the ethical conduct of scientists, perhaps in the form of a voluntary Hippocratic Oath”¹⁷. The United Nations Educational Scientific and Cultural Organisation (UNESCO) has also been active in this area and arranged several meetings on this topic to identify means of advancing the concept of codes of conduct¹⁸.

Types of Code

9. Although there is clear support for some form of code of conduct, the documentation from the 2005 Meeting of Experts shows that there are a variety of types of code that could be applied to the life sciences and these can be categorised as ‘Enforceable codes’, ‘Advisory codes’ and ‘Ethical codes’. Enforceable codes are widely understood as the strongest form of code and unlike aspirational and ethical variants, enforceable codes would imply some means of punishing violations. Whilst this acts as a more explicit deterrence, such codes would require careful and harmonious assimilation within national legal systems and regulations. However, such a code should not be constructed *de novo* and in Bradford Briefing Paper No. 15¹⁹, it is shown how a code of practice could be assimilated into existing legislation and regulations in the context of the UK citing existing law such as Health and Safety at Work legislation as laying the foundations for a BW orientated code of practice²⁰.

¹³ See Graham S. Pearson, *A Code of Conduct for the Life Sciences: A Practical Approach*, University of Bradford, Department of Peace Studies, Briefing Paper No. 15, November 2004. Available at: <http://www.brad.ac.uk/acad/sbtwc>

¹⁴ See: The Royal Society, *The roles of codes of conduct in preventing the misuse of scientific research*, RS policy document, June 05. Available at: <http://www.royalsoc.ac.uk/displaypagedoc.asp?id=13648>

¹⁵ See: The National Academy of Sciences [US], *Biotechnology Research in an Age of Terrorism*, 2004. Available at: <http://www.nap.edu/books/0309089778/html>

¹⁶ Elisa Harris & John D. Steinbruner, *Scientific Openness and National Security after 9-11*, CBW Conventions Bulletin, Issue no 67 March 2005. Available at: <http://www.sussex.ac.uk/Units/spru/hsp/CBWCB67.pdf>

¹⁷ Joseph Rotblat IN Daniel Fu-Chang Tsai & Ding-Shinn Chen, *An oath for Bio-scientists*, Journal of Bio-Medical Sciences, Volume. 10 2003. Available at: <http://content.karger.com/ProdukteDB/produkte.asp?Aktion=ShowPDF&ProduktNr=224178&Ausgabe=229614&ArtikelNr=73521>

¹⁸ See: United Nations Educational Scientific and Cultural Organisation, *Code of Conduct for Scientists: expert group meeting report*, UNESCO Ethics Themes. Available at: http://portal.unesco.org/shs/en/ev.php-URL_ID=8529&URL_DO=DO_TOPIC&URL_SECTION=201.html

¹⁹ Graham S. Pearson, *A Code of Conduct for the Life Sciences: A Practical Approach*, University of Bradford, Peace Studies Department Briefing Paper No 15. November 2004. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_15_2ndseries.pdf

²⁰ Pearson suggests the following articles of legislation as providing a framework for a code of Practice in the UK: Health and Safety at Work legislation, Protection of the Environment, Export Controls, Ethical Considerations, Animal Experimentation, Product Safety and Efficacy, Proscribed Drugs and Precursors, Genetic Modification, Security of and Access to Human Pathogens and Toxins. See Graham S. Pearson, *A Code of Conduct for the Life Sciences: A Practical Approach*, University of Bradford, Peace Studies Department

10. ‘Advisory codes’ or codes of ethics developed by scientific societies could function to ‘provide guidelines suggesting how to behave’²¹. More detailed advisory guidelines, examples of which would be the International Committee of the Red Cross’s “From Ethics and Law to best Practice”²² or the UK’s General Medical Council’s guidance booklets²³, although not codes *per se* could present guidelines for conduct in general areas and advice for responding to specific incidents and could certainly prove useful in raising awareness and guiding life scientists in the future. However, care needs to be taken in formulating such codes to avoid diluting their effectiveness by excessive detail. Furthermore, unlike enforceable codes, advisory codes are unlikely to be directly connected with any form of punishment and hence may be viewed as a weaker obstruction to the malign use of biology, causing a degree of scepticism regarding the efficacy of advisory codes upon influencing behaviour.²⁴

11. Ethical codes, which relate closely to what Australia termed²⁵ a “*Universal code*” should be “*short aspirational code[s] containing general principles and referring to ethical norms*”. Without any form of punishment, codes of ethics are widely regarded as the least potent means of regulating the life sciences. Furthermore, it can be argued that their brief and more abstract nature means that codes of ethics are unlikely to be sufficiently comprehensive to set out in detail the differences between permitted and illegal activities. However, it is equally true that a carefully drafted obligation not to carry out prohibited activities will stand the test of time and not require frequent amendment to deal with advances in science. Nonetheless, such perceptions have meant that ethical codes may be viewed with scepticism.

12. There are several advantages to employing ethical codes nonetheless. Firstly, ethical codes should be comparatively easy to implement compared with enforceable or advisory codes. Secondly, a short ethical code enables greater flexibility in implementation and could be taken either as a signed statement or orally as an oath. Finally, in circumstances where the distinction between acceptable and prohibited research is not clearly defined²⁶ the implementation of a code of ethics, which would identify the underlying principles, may function to both raise awareness and *initiate a process* of discussion leading to a clearer differentiation between accepted and prohibited research.

Briefing Paper No 15, p. 18, November 2004. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_15_2ndseries.pdf

²¹ Brian Rappert, *Towards a Life Sciences Code: Countering the Threats from Biological Weapons*, University of Bradford, Department of Peace Studies, Briefing Paper no 13. September 2004. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_13_2ndseries.pdf

²² See the International Committee of the Red Cross, *Preventing hostile use of the life sciences: From ethics and law to best practice*, 28 September 2005. Available at: http://www.icrc.org/Web/Eng/siteeng0.nsf/html/66NC2R?OpenDocument&style=Custo_Final.3&View=defaultBody2

²³ The General Medical Council (GMC) has developed at least 7 booklets that detail the duties and responsibilities of a doctor. These are available at the GMC publications unit by request. Email: Publications@gmc-uk.org

²⁴ Brian Rappert, *Towards a Life Sciences Code: Countering the Threats from Biological Weapons*, University of Bradford, Department of Peace Studies, Briefing Paper no 13. September 2004. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_13_2ndseries.pdf

²⁵ Australia, *Codes of Conduct for Scientists: Considerations during a BWC regional Workshop and Subsequent Reflections*, BWC/MSP/2005/MX/WP.35, 24 June 2005. Available at: <http://www.opbw.org/>

²⁶ See Canada, *Biodefence; Codes of Conduct and Practice*, BWC/MSP/2005/MX/WP.5, 9 June 2005. Available at: <http://www.opbw.org/>

‘Matrices’ or ‘Layers’ of Codes

13. The existence of distinct types of code should not imply that code variants are mutually exclusive of one another and one further option could be a combination of complimentary variants of code, as suggested in both Bradford Briefing Paper 13²⁷ and Australian Working Paper 35²⁸. In the wider context this is already being done by the medical community, which, certainly in the UK, advocates the taking of an oath²⁹ - a public declaration of a succinct code of ethics, supported by the GMC’s guidance booklets and ultimately enforceable medical legislation. This combination of a short ethical code, several more detailed handbooks and legislation, facilitates the creation of an overarching ethos of professional medical conduct embodied in the oath, complimented by specific instance advisory guidelines and standards. This is further reinforced by the threat of deregistration and finally criminal prosecution cases of proven breach³⁰.

14. Although there is evidently potential for layers or matrices of codes, the articulation of the component parts of such a matrix is unlikely to be done at the Meeting of States Parties in December 2005. Indeed, some commentators have argued that such an approach may prove distracting from the main objective to “*discuss, and promote common understanding and effective action*”. Thus a more appropriate first step for the Meeting of States Party in December would be to agree upon the key principles upon which an ethical code could be developed. Such key principles, which are already largely embodied in the language of the Convention, could then form the basis of internationally promulgated ethical codes that could be developed further by scientific institutions for use as a Hippocratic style oath and thus could constitute a first step in raising awareness amongst life scientists.

A study of the medical profession in the UK

15. A Hippocratic style oath for graduates would not be constructed completely *de novo* and already several universities internationally require graduates to take some form of pledge³¹. Furthermore, codes of ethics such as the Hippocratic Oath and the Declaration of Geneva – which was developed by the World Medical Association following the Second World War – have a long history in medical profession and are generally adhered to around the world even though they are ethical standards with little if any provision for enforcement.

16. To gain a deeper understanding of the efficacy of oaths as part of medical graduation ceremonies, a small scale study was devised to answer the question: ‘What is the attitude of junior doctors to oath taking as part of a graduation ceremony?’ Questionnaires (see Appendix I for format) were distributed to a sample of 25 Pre-Registered House Officers

²⁷ Brian Rappert. *Towards a Life Sciences Code: Countering the Threats from Biological Weapons*, University of Bradford, Department of Peace Studies, Briefing Paper no 13. September 2004. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_13_2ndseries.pdf

²⁸ Australia, *Codes of Conduct for Scientists: Considerations during a BWC regional Workshop and Subsequent Reflections*, BWC/MSP/2005/MX/WP.35, 24 June 2005. Available at: <http://www.opbw.org/>

²⁹ British Medical Association IN: Kaji Sritharan *et al*, *Medical oaths and declarations*, The British Medical Journal, Volume 323 Dec 2001. Available at: <http://bmj.bmjournals.com/cgi/content/full/323/7327/1440>

³⁰ The General Medical Council [UK] guidelines on ‘good medical practice’ states “serious and persistent failures to meet the standards in this booklet may put your registration at risk.” See: General Medical Council [UK] (2001) “Good Medical Practice”, *Duties and Responsibilities of Doctors*, The General Medical Council, September 2001. Available at Publications@gmc-uk.org

³¹ See: The Graduation Pledge Alliance, *Explanation of the Pledge Project*, Humboldt State University in California (USA), Manchester College. Available at: <http://www.graduationpledge.org/cards.html#pledge>

(PRHOs) over a three-week period in late 2004. These PRHOs were selected on the basis of their accessibility in the West Yorkshire region of the UK. All had completed the minimum 5 years of medical education and were just beginning to work independently with patients.

17. In the first section of the questionnaire PRHOs were asked which sources they felt were most influential in making ethical decisions; subsequently, they were asked whether they considered the Declaration of Geneva (see Appendix II) - as taken as part of graduation ceremonies - a significant tool in making ethical decisions and why. Then participants were asked whether they thought an oath was professionally necessary and whether it was appropriate to take an oath at graduation ceremonies. They were also encouraged to elaborate on their answers to both these questions in the written section of the questionnaire. Finally, participants were asked, "How do you feel taking an oath has acted upon you both professionally and personally?"

18. With 19 respondents, the limited scale of this study means the results cannot be broadly extrapolated, nonetheless the results prove interesting. A significant number, 37%, cited General Medical Council (GMC) guidelines as being the *most* influential in ethical decision-making. 25% cited 'consultation with senior' as being the main influence on ethical decision-making, 21% selected 'peer discussion' and 11% selected 'other'. Notably, only one participant cited the Declaration of Geneva as being the most important source for ethical decision-making.

19. On the basis of the answers in section one of the questionnaire, one could assume the Declaration of Geneva failed to influence the behaviour of some PRHOs in the Yorkshire region. However in response to the question "Do you consider the Declaration of Geneva a significant tool in making ethical decisions?" 60% of participants asserted it was significant and when asked why, several participants referred to the declaration as a "good summary" of the principles governing medical ethics. Of the 37% of respondents who contended the declaration was not significant their reasoning was that there were better alternatives available. Hence one participant argued the Declaration of Geneva was "Not easy to apply to all clinical situations" and that there was "better guidance available from GMC/Medical Protection Society/Seniors"³²

20. In response to the question "Do you think an oath is professionally necessary?" 63% of participants said that an oath was necessary, although the reasoning behind this response varied. Thus one response stated that it "brings together training and although not legally binding, confirms your responsibilities" whereas several respondents referred to a 'symbolic', 'bonding', or 'uniting' process with one participant stating: "Taking the oath is symbolic [of] entering into a body of doctors". In contrast seven participants felt the oath was not necessary. The reasoning they gave was largely that the ethical training they received or the GMC regulations negated the need for an Oath.

In the Life Science context

21. There are differences between the medical profession and those engaged in the life sciences. Firstly, in the UK there is no life science equivalent to the General Medical Council (GMC), and achieving widespread consensus on a meaningful life science equivalent to the

³² James Reville, *A Hippocratic Oath for Life Scientists*, Masters in Research Methods Dissertation, University of Bradford Peace Studies Department, 2005.

GMC's 'Guidances' may be difficult if, as has been suggested in the UK context, life scientists do not recognise "that developments in the life sciences research contributed to biotreats"³³. Secondly, the current ethics education in life science courses in the UK differs considerably from the ethical education of medical students, in which ethics comprises a significant component of the minimum five years of medical education that occurs previous to taking any form of oath. Indeed, the 2003 GMC's text *'Tomorrow's Doctors'* recommends "Put[ting] the principles set out in Good Medical Practice *at the centre of undergraduate education*"³⁴. Thirdly there are different dynamics in the relationship between practitioner and public. Whereas the medical practitioner's primary responsibility is to the patient³⁵, those engaged in the life sciences are more diffuse involving a wider public. Whereas the first two factors suggest that awareness of the relevant ethical issues may currently be less advanced in the life science community than in the medical community; the latter point suggests that, as biotechnology continues to advance, there will be a pressing need for greater awareness amongst life scientists of their increasingly significant responsibility to the public.

22. In this context the taking of an oath may be useful as a first step towards raising awareness of the dangers of dual-use research in future generations of life scientists. Moreover, despite the seemingly limited utility of publicly declared ethical oaths in *directly* affecting behaviour, the doctor's emphasis on the symbolic bonding process exemplified in the responses "belonging to a profession" or "united as a profession" category, suggests such a model may serve a useful secondary purpose in forming a life science identity which enables the construction of a broader life science norm.

23. Indeed, whereas laws can be seen as a formal product of necessity for the good of the whole and the protection of individuals, ethics are the informal product of the expectations of groups or societies. Every group has expectations of what is considered ethical behaviour and these group standards of behaviour are assimilated by the individual, cumulatively forming the individuals 'morality'. Notably, not all the group standards of behaviour will be strictly adhered to and the individual choice of whether or not to assimilate an element of a group standard largely depends upon the level of identification the individual feels towards towards the group³⁶. Group standards are believed to impact on the individual particularly where they are categorizable as being a 'high identifier' – i.e. one who identifies strongly with the group. This is particularly significant if the process of taking a graduation ceremony oath reinforces group identities. As Torpman claims "the awareness of membership as a particular role makes it possible to define the conditions for membership"³⁷.

³³ Malcolm R. Dando & Brian Rappert, *Codes of Conduct for the Life Sciences: Some Insights from UK Academia*, University of Bradford, Peace Studies Department, Briefing Paper No 16, May 2005. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_16_2ndseries.pdf

³⁴ General Medical Council, *Tomorrow's Doctors - Recommendations on Undergraduate Medical Education*, General Medical Council February 2003. Available at: <http://www.gmc-uk.org/education/undergraduate/tomdoc.pdf>

³⁵ John R. Williams, *Medical Ethics Manual*, World Medical Association, 2005. Available at: <http://www.wma.net/e/ethicsunit/resources.htm>

³⁶ See Deborah J. Terry *et al*, *The theory of planned behaviour: self-identity, social identity and group Norms*, 'British Journal of Social Psychology' 1999 Sep Volume 38 (Pt 3) pg 225-44. Available at: <http://www.ingentaconnect.com/content/bpsoc/bjps/1999/00000038/00000003/art00001>

³⁷ Jan Torpman *et al*, *Identity-Driven Decision-Making*, Södertörns Högskola (University college) Working Paper 2004:1. Available at: http://www.diva-portal.org/diva/getDocument?urn_nbn_se_sh_diva-72-1_fulltext.pdf

24. Agreement on the value of publicly declaring an oath *en masse* in the graduation ceremony environment can be seen as having several advantages as a first step in the process of raising awareness amongst life scientists: these are listed and subsequently discussed below:

- High numerical catchment;
- Typically formative age of subscribers;
- Proactive process of awareness raising through pledging/promising in front of significant others;
- Sustainable annually – thus creating *and maintaining* a standard within the population concerned;
- Process initiates further discussion;
- A public ethical code may enable the public greater understanding of principles guiding life scientists;
- Not overly burdensome;
- Not a strain to institutions with meagre resources;
- May contribute to identity reinforcement and;
- May contribute to group standard reinforcement.

25. Firstly, if an oath was targeted at all graduating life science students, it is likely to have a greater numerical catchment than codes used in societies since the majority of students attend their graduation ceremony and thus it could be undertaken by most of those with the requisite skills that could be misused in breach of the prohibitions in the BTWC. Secondly, given that the average age of graduation, at least in the UK, is likely to be between 21 and 24³⁸ the graduation ceremony typically occurs during a formative stage of the individuals' development. As the US-based scientific research society, Sigma XI has stated, "If pre-college experiences are formative, college years can establish the attitudes and behaviour that a person carries into graduate school and on into later research"³⁹.

26. The graduation ceremony oath has a further advantage in that it requires open, active public acknowledgement of one's responsibilities in contrast to the assumed acceptance of signed statements. Moreover, such conscious acknowledgement is made in front of significant others – such as relatives and peers, who are those most likely to attend graduation ceremonies. The annual nature of graduation ceremonies further necessitates that subsequent generations would take the oath and this could contribute significantly to the creation and maintenance of a culture of awareness and responsibility in the future.

27. Rappert has argued that the process of developing a code of conduct for the life sciences may generate momentum to further the discussion on what is permissible and what is outlawed⁴⁰. Would not the existence of a concluding graduation ceremony oath help to

³⁸ Higher Education Statistics Agency, *Definitions for Table 19: International Comparisons Data, Higher Education In the UK*, Table 19, 2001. Available at: http://www.hesa.ac.uk/products/pubs/contents/heintheuk/table19_2001.htm

³⁹ Sigma XI, *The responsible Researcher: Paths and Pitfalls*, Sigma Xi - The Scientific Research Society, 1999. Available at: <http://www.sigmaxi.org/programs/ethics/publications.shtml>

⁴⁰ Brian Rappert, *Towards a Life Sciences Code: Countering the Threats from Biological Weapons*, University of Bradford, Department of Peace Studies, Briefing Paper no 13. September 2004. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_13_2ndseries.pdf See also The Royal Society, *The roles of codes of conduct in preventing the misuse of scientific research*, RS policy document June 2005. Available at: <http://www.royalsoc.ac.uk/displaypagedoc.asp?id=13648>

stimulate debate amongst the code's subscribers during the process of life science learning? This process of debate is fundamental in resolving the currently difficult issue of differentiating between prohibited and permissible research and thus the existence of an oath can be seen as the first step in the process of effective awareness raising *and* defining currently grey areas for future scientists.

28. An orally proclaimed code of ethics may prove less burdensome both to scientists, who in many cases already feel over regulated, and to States with fewer resources. Consequently such an approach may, based on the study of PRHO attitudes to the Declaration of Geneva, be welcomed. Moreover an oath that highlighted the key principles of the life science profession to the public may further prove useful in building both public trust and understanding of life sciences constraints and decision-making processes⁴¹.

29. Finally, oath taking may reinforce identities, hence in response to the penultimate survey question which asked reasons for taking an oath or not, several participants identified some form of initiation into a profession as being one of the reasons why they supported oath taking. This group identity reinforcement is conducive to increasing the individual's level of identification, therefore low identifiers taking an oath *en masse* may be encouraged to more readily connect with the 'life science' group and accordingly adhere to, or at least become aware of, the group's norms.

30. Cumulatively, these advantages clearly suggest that a focus on a publicly stated oath could have great potential in raising awareness. The next sections build on the idea of taking such an oath and discuss the content of an oath; the means by which an oath could be promulgated internationally; and methods of facilitating the adoption of an oath. In particular it addresses the issues discussed at the 2005 Meeting of Experts over universality and top-down/bottom-up promulgation.

Content

31. Concerning universality, those who argued against one universal code presented a variety of reasons why "there is no one size fits all approach" to codes⁴². For example, the Islamic Republic of Iran stated:

*"Content of particular codes may necessarily vary depending on their individual context and objectives and the way in which the codes are intended to be applied by organizations or professional bodies. The adoption of universal code of conduct would not, therefore, bear the expected results, since it would be seen as an additional international input without creating the necessary domestic grounds to sensitize the individuals directly involved in relevant activities."*⁴³

The United States of America stated:

⁴¹ This is argued to be one of many functions of medical principles see Vivian Nathanson, *Commentary: Why We Need a New Hippocratic Oath*, Journal of Medical Education, December 2003. Blackwell Publishing Ltd.

⁴² See the US view set out IN: Graham S. Pearson, *The Biological and Toxin Weapons Convention Meeting of Experts*, Report from Geneva, Quarterly Review no 23, *CBW Conventions Bulletin* no. 68, June 2005. Available at: <http://www.sussex.ac.uk/Units/spru/hsp/CBWCB68.pdf>

⁴³ Islamic Republic of Iran, *The Content Promulgation and Adoption of Codes of Conduct for scientists*, BWC/MSP/2005/MX/WP.26, 20 June 2005. Available at: <http://www.opbw.org/>

“...There is no “one size fits all” approach to codes of conduct. A Universal code of conduct is in our view not feasible”⁴⁴

and Australia stated:

“...It is widely acknowledged that requiring all scientists the world over to adhere to a single, universal code is unlikely to be successful. Scientists represent a diverse group of individuals, working across many different fields and within vastly different cultural contexts.”⁴⁵

32. Although such concerns support the ‘no one size fits all approach’ they should not be seen as negating the possibility that *key principles* for an international oath could be agreed by the States Parties. Indeed, the Meeting of States Parties in December 2005 will present an opportunity to convert the current support for, and interest in, raising awareness into the promotion of effective action by agreeing on the underlying norms embodied in the Convention. These key principles could then form the basis of an international framework for national or institutional graduation oaths. Given the focus on an oath, such building blocks need only provide a clear and simple identification of the *key aspirations*.

33. Indeed, in order to raise awareness in the scientific community and address the main concerns of the biological arms control community, there would be significant advantages if the States Parties agreed on the value of the promoting the following key principles as a basis for any code or oath:

- Not engage in work on the development or production of agents, toxins, weapons, equipment or means of delivery specified prohibited by international law;
- To encourage scientists to consider the negative ramifications of work prior to initiation and prior to publication;
- To encourage the scientific community to maintain the safety and security of agents and equipment that could be used in potentially dangerous work;
- To encourage scientists to contribute to the development of safeguard mechanisms and oversight systems.

Agreement on these four issues is clearly not beyond the scope of the States Parties meeting in December 2005 and could provide a useful foundation for promoting effective action on a Hippocratic style oath for life scientists, or indeed an ethical code for scientists, and serve the aim of reaffirming some of the key principles embodied in the BTWC.

Promulgation

34. Assuming that the States Parties agreed the underlying principles for any code in the December 2005 meeting, they could make a further, fundamental contribution if they agreed on the value of supporting the promulgation and promotion of the underlying principles as a basis for any national code or oath. Although several States Parties have argued that a code should be promulgated through a bottom-up approach, realistically this requires scientists to

⁴⁴ See the US view set out IN: Graham S. Pearson *The Biological and Toxin Weapons Convention Meeting of Experts*, Report from Geneva, Quarterly Review no 23, *CBW Conventions Bulletin* no. 68, June 2005. Available at: <http://www.sussex.ac.uk/Units/spru/hsp/CBWCB68.pdf>

⁴⁵ Australia, *Codes of Conduct for Scientists: Considerations during a BWC Regional Workshop and Subsequent Reflections*, BWC/MSP/2005/MX/WP.35, 24 June 2005. Available at: <http://www.opbw.org/>

take the initiative and this is unlikely. It is unlikely, certainly in the UK context, because as Dando and Rappert⁴⁶ have argued:

There was little evidence from our seminars that participants:

- a. *Regarded bioterrorism or bioweapons as a substantial threat;*
- b. *Considered that developments in the life sciences research contributed to biothreats;*
- c. *Were aware of the current debates and concerns about dual-use research; or*
- d. *Were familiar with the BTWC.*

Such a bottom-up approach could also be unsuitable because scientists may overlook important issues considered to be on the periphery of science, as Wolpert⁴⁷ has stated:

“There is, in fact a grave danger in asking scientists to be more socially responsible – the history of eugenics alone illustrates at least some of the dangers. Asking scientists to be socially responsible ... would implicitly give power to a group who are neither trained nor competent to exert it”

35. Accordingly, although the promulgation of a code framework should *initially* be top down, the construction, and when necessary revision,⁴⁸ of a code, based on this framework, should be the responsibility of the relevant scientific and educational institutions. Indeed, this is fundamental in achieving a consensus and encouraging more senior life scientists to engage with the issue of awareness, which is important if a code is to avoid alienating those it seeks to guide. Certainly Beyerstein contends that the functions of a code can only be fulfilled if the code is the product of a consensus of those it seeks to guide⁴⁹, as this may lead to the articulation of internal morality of the life science profession⁵⁰. The same argument is likely to apply to an oath and moreover, this process would enable an oath or code to be embedded in the cultural, linguistic and religious context of the nation or institution it would seek to guide. Thus whilst the building blocks of a code should be constructed at an international level the actual form of the code used in particular institutions would be varied to suit local circumstances.

⁴⁶ Malcolm R. Dando & Brian Rappert, *Codes of Conduct for the Life Sciences: Some Insights from UK Academia*, University of Bradford, Peace Studies Department, Briefing Paper No 16, May 2005. Available at: http://www.brad.ac.uk/acad/sbtwc/briefing/BP_16_2ndseries.pdf

⁴⁷ Lewis Wolpert IN: Kathinka Evers, *Standards for Ethics and Responsibility in Science*, The International Council for Science, 2001. Available at: http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/218_DD_FILE_Background_1.pdf

⁴⁸ If one of the underlying aspirations of a oath is to encourage scientists to contribute to the development of regulations in a time of rapidly advancing science then there would be a need for oaths to be ‘living documents’ that were regularly updated.

⁴⁹ D. Beyerstein IN: In Earl R. Winkler & Jerrold R. Coombs (Eds.), *Applied Ethics: A Reader*, (pp. 1-10). Cambridge, Mass. Blackwell Publishers.

⁵⁰ It has certainly been suggested that this is one function of medical oaths. See: Henk Ten Have, *Towards a universal ethical oath for scientists*, United Nations Educational, Scientific and Cultural Organization, COMEST Third Session, 1-4 December 2003. Available at: <http://unesdoc.unesco.org/images/0013/001343/134391e.pdf>

Adoption

36. The successful adoption of oaths depends significantly on gaining a consensus within the scientific community and, as Australia has suggested, “win[ning] the hearts and minds of relevant science communities”⁵¹. The use of the bottom up approach in finalising oaths would significantly contribute to generating support, as it would allow scientists to have a degree of ownership of an oath. However, in order to further encourage support for oaths in the scientific community, one approach could be to applaud those whom an oath would seek to guide in the preambular paragraph. Indeed, the graduation ceremony context suggests that oath taking should acknowledge the achievements of graduating students in addition to encouraging them to consider their future responsibilities. Thus one way of raising awareness and mitigating resistance to an oath could be to begin with:

- Knowledge of the life sciences is a privilege and with such privilege comes responsibility. In entering into the community of life scientists I pledge⁵²:

37. Expanding the focus beyond the biological weapons context could further increase the value of an oath. Analysis of previous codes and oaths⁵³ has revealed there are several internal ethical obligations the life science community adheres to and these can be loosely categorised as:

- Integrity - the category of integrity aims to instil a sense of ‘honesty & fair dealing’
- Objectivity – the need for scientists to remain impartial in professional and business judgements
- Competence – the need for scientists to act with skill and care and not undertake work beyond ones capability
- Professionalism – Diligence and ‘proper regard for safety and technical standards’⁵⁴.

The inclusion of these elements can increase the value of any oath from the perspective of the scientific community. Moreover, encouraging emerging generations of life scientists to have proper regard for the safety and security of dangerous agents further contributes to the underlying aims of any oath from the BTWC perspective. However, careful consideration needs to be given to the language used in codifying these elements if the intention is to generate both sufficient support amongst life scientists *and* ensure the document would be meaningful.

38. Attempting to codify the integrity element, one means to proceed would be to include the words ‘honest’, ‘fair’ and ‘open’ as aspirations. Thus the first stipulation could state:

- To be honest, fair and open in my work;

⁵¹ Australia, *Codes of Conduct for Scientists: Considerations During a BWC Regional Workshop and Subsequent Reflections*, BWC/MSP/2005/MX/WP.35, 24 June 2005. Available at: <http://www.opbw.org/>

⁵² ‘Pledge’ could be replaced by ‘promise’ or ‘swear’.

⁵³ See American Medical Association, *Principles of medical ethics*, June 17, 2001. Available at: <http://www.ama-assn.org/ama/pub/category/2512.html>; The Australian Society for Microbiology, *Ethics*. Available at: <http://www.theasm.com.au/index.asp>; The Institute of Biology *Code of Conduct And Guide on Ethical Practice*, 2004. Available at: <http://www.iob.org/>

⁵⁴ Institute of Biology [UK], *Code of Conduct And Guide on Ethical Practice*, 2004. Available at: <http://www.iob.org/>

39. This leads to the issue of competence, a key internal aspiration any oath must impress upon its target population and one that may prove useful in mitigating current concerns regarding the life sciences. In the UK, the Institute of Biology requires members to exercise “due skill, care, diligence and expedition with proper regard for the health and safety, technical and professional standards expected of a member”⁵⁵ and building on this, one stipulation could be a pledge:

- To act with due skill and diligence in all scientific work;

However, As Pearson, points out scientists in the UK also have a responsibility under the UK Health and Safety at Work Act 1974:

*“To make further provision for securing the health, safety and welfare of persons at work, **for protecting others against risks to health or safety in connection with the activities of persons at work, for controlling the keeping and use and preventing the unlawful acquisition, possession and use of dangerous substances...**”*

Thus, one could include the proviso:

- To ensure the agents and equipment used in dangerous work are kept safe;

40. Although the expounding of the life science communities internal ethics could be important in increasing the value of an oath from the perspective of the life science community, the main focus, from a BTWC perspective, should be on raising awareness amongst life scientists of the dual-use problem and the BTWC’s prohibitions. Significantly, this section has to do more than just inspiring individuals not to make biological weapons and the key principles proposed in this paper provide a useful basis for building a code which address wider concerns related to biotechnology. Nonetheless, a pledge not to make biological weapons is a clear starting point for this section particularly if the stipulation refers to the BTWC or ‘International Law’ as this should contribute to raising awareness of the existence of such international legislation. Thus including the following statement may prove useful:

- Not to knowingly engage in work on offensive biological and toxin weapons prohibited by international law;

41. In order to avoid individuals or groups exploiting the term ‘knowingly’ the inclusion of a stipulation encouraging scientists to consider the ramifications of their work may prove useful. Furthermore, this contributes directly to awareness raising. Therefore this paper suggests the inclusion of the following stipulation would be useful in any code or oath:

- To give consideration to the potentially negative ramifications of my work particularly before commencement and previous to publication;

⁵⁵ Institute of Biology [UK], *Code of Conduct And Guide on Ethical Practice*, 2004. Available at: <http://www.iob.org/>

42. Finally, given the current difficulty in identifying the negative ramifications of work and distinguishing between permissible and prohibited research⁵⁶ and the fundamental need to include scientists in any such discussion, the inclusion of a stipulation encouraging scientists to contribute towards the development of regulations supporting the aims of the BTWC may contribute to the advancement of the Convention. Indeed, the inclusion of the following statement, could facilitate moving the process beyond awareness raising and towards a sustainable culture of awareness and responsibility:

- To contribute to the development of safeguards and oversight mechanisms.

43. Based on an analysis of existing codes, the issues highlighted at the 2005 Meeting of Experts and the previous discussion, a code of conduct could take the form set out in Table 2:

Table 2: A Code for the Life Scientists

<p><i>1. Knowledge of the life science is a privilege and with such privilege comes responsibility as the life sciences can be used for both benign and malign purposes. In entering into the community of life scientists I pledge:</i></p> <p><i>2. To be honest, fair and open as possible in my work;</i></p> <p><i>3. To act with due diligence and care in all scientific work;</i></p> <p><i>4. To ensure the agents and equipment used in dangerous work are kept safe;</i></p> <p><i>5. Not to knowingly engage in the development and production of biological and toxins weapons prohibited by international law;</i></p> <p><i>6. To give consideration to the potentially negative ramifications of my work particularly before commencement and previous to publication;</i></p> <p><i>7. To contribute to the development of safeguards and oversight mechanisms.</i></p>
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A Hippocratic Oath for Life Scientists

44. The previous sections suggest that there is a clear role for codes, or matrices of codes, of conduct as a first step in a ‘dual-use research’ awareness-raising program for future life scientists. However, there are a variety of codes and combinations of code, which could be developed. In this respect, one approach, which could be addressed by the December 2005 meeting, would be to recognise the value of a Hippocratic style oath for life scientists. Oral statements such as the Hippocratic Oath and the Declaration of Geneva have a long history of being used and are largely adhered to around the world. Moreover such an approach would enable a process of sustainable, proactive awareness raising amongst life scientists at a formative age which could function as the first step towards the strengthening of norms related to the prohibition of the development, production, acquisition and stockpiling of biological weapons.

⁵⁶ See: Canada, *Biodefence; Codes of Conduct and Practice*, BWC/MSP/2005/MX/WP.5, 9 June 2005. Available at: <http://www.opbw.org/>

45. Assuming the outcome of the Meeting of States Parties in 2005 will be a document similar in form to that produced by the Meeting of States Parties in 2004⁵⁷, it would have three components. The first component would list the points that the States Parties recognised as having value. The second component would identify points that the States Parties consequently agreed and the third component would encourage States Parties to inform the Sixth Review Conference of any actions they may have taken on the basis of the 2005 meetings.

46. The arguments put forward in this paper show that it would be useful if States Parties would recognise the value of:

- a. Codes of conduct taken in the form of a Hippocratic Style Oath as a useful first step in raising awareness amongst life scientists *and*;
- b. Listing key principles that such a code or codes could be based upon.

Thus the wording of the section of the final report listing the points that the States Parties recognised as having value might read:

On the mandate to discuss, and promote common understanding and effective action on the content, promulgation, and adoption of codes of conduct for scientists, the States Parties recognised that:

Then one of these points could be:

Taking a Hippocratic style oath en mass at graduation ceremonies could be valuable as a first step in raising awareness amongst life scientists

Another point could be:

Key principles for codes could include inter alia the following:

- *Not engage in work on the development or production of agents, toxins, weapons, equipment or means of delivery specified prohibited by international law;*
- *Consider the negative ramifications of work prior to initiation and prior to publication;*
- *Maintain the safety and security of agents and equipment that could be used in potentially dangerous work;*
- *To encourage scientists to contribute to the development of safety mechanisms and oversight systems.*

47. In the next section of the report setting out where States Parties agreed on the value, this could start with the phrase:

⁵⁷ United Nations, Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their destruction, Geneva, 6-10 December 2004, *Report of the Meeting of States Parties*. BWC/MSP/2004/3, 14 December 2004. Available at: <http://www.opbw.org/>

The States Parties consequently agreed on the value of:

One of the listed points could be:

Encouraging the development, promulgation, and adoption of Hippocratic style oaths, based on the agreed principles, to be taken at graduation ceremonies as a first step in raising awareness amongst life scientists.

48. Given that oaths would not be difficult to construct it might well be possible for progress to be made by States Parties prior to the Sixth Review Conference. Consequently, the third part of the report would encourage States Parties to inform the Sixth Review Conference of any actions they may have taken on the basis of the 2005 meetings.
49. This approach would constitute an effective first step in the process of awareness raising amongst those engaged in the life sciences on the dual-use issue and could be achieved at a minimum cost without overly burdening life scientists. Accordingly there would be clear advantages in the States Parties recognising the value of this approach.

Appendix I – PRHO Questionnaire

Section I: Demographic Information

Ethnic Grouping:

White	<input type="checkbox"/>
Mixed	<input type="checkbox"/>
Indian	<input type="checkbox"/>
Pakistani	<input type="checkbox"/>
Bangladeshi	<input type="checkbox"/>
Other Asian	<input type="checkbox"/>
Black Caribbean	<input type="checkbox"/>
Black African	<input type="checkbox"/>
Other Black	<input type="checkbox"/>
Chinese	<input type="checkbox"/>
Other Ethnic Group	<input type="checkbox"/>

Age range:

20 - 25	<input type="checkbox"/>
25 - 30	<input type="checkbox"/>
30 - 35	<input type="checkbox"/>
35 - 40	<input type="checkbox"/>
45 - 50	<input type="checkbox"/>
55 - 60	<input type="checkbox"/>
60 +	<input type="checkbox"/>

Sex:

Male	<input type="checkbox"/>
Female	<input type="checkbox"/>

Section II: Preference of source in Ethical decision making

In making ethical decisions which of the following sources do you feel is most influential (please rank in order to importance with 1 as the most importance 6 as the least)

Declaration of Geneva	<input type="checkbox"/>
GMC guidelines	<input type="checkbox"/>
Peer discussion	<input type="checkbox"/>
Consultation with senior	<input type="checkbox"/>
Religious values	<input type="checkbox"/>
Other	<input type="checkbox"/>

Section III: Declaration of Geneva:

Do you consider the Declaration of Geneva, as taken as part of graduation ceremonies, a significant tool in making ethical decisions?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

Why, please provide a reason for previous answer:

Appendix II –Declaration of Geneva (1983)

The World Medical Association Declaration of Geneva (1983) Physician's Oath

Adopted by the General Assembly of the World Medical Association, Geneva, Switzerland, September 1948. Amended by the 22nd World Medical Assembly, Sydney, Australia, August 1968, and by the 25th Assembly in Venice, 1983.

- At the time of being admitted as a Member of the Medical Profession:
- I solemnly pledge myself to consecrate my life to the service of humanity;
- I will give to my teachers the respect and gratitude which is their due;
- I will practice my profession with conscience and dignity;
- The health of my patient will be my first consideration;
- I will respect the secrets which are confided in me, even after the patient has died;
- I will maintain by all the means in my power, the honor and the noble traditions of the medical profession;
- My colleagues will be my brothers;
- I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patients;
- I will maintain the utmost respect for human life from its beginning even under threat, and I will not use my medical knowledge contrary to the laws of humanity;
- I will make these promises solemnly, freely and upon my honor.