Endnotes, Including References

[1] Sonia Ben Ouagrham-Gormley, "Plagued by Errors: New Approach Needed to Tackle Proliferation Threats from Anti-Plague System," *Arms Control Today*, March 2006; http://www.armscontrol.org/act/2006_03/MARCH-PlagueFeature.asp.
[2] Sonia Ben Ouagrham-Gormley, Alexander Melikishvili, and Raymond A. Zilinskas, 2006. "The Soviet Anti-plague System: An Introduction," *Critical Reviews in Microbiology* 32(1):15-14; Alexander Melikishvili, 2006, "Genesis of the Anti-plague System: The Tsarist Period," *Critical Reviews in Microbiology* 32(1):19-31; Sonia Ben Ouagrham-Gormley, 2006, "Growth of the Anti-plague System during the Soviet Period," *Critical Reviews in Microbiology* 32(1):33-46; Raymond A. Zilinskas, 2006, "The Anti-plague System and the Soviet Biological Warfare Program," *Critical Reviews in Microbiology* 32(1):47-64; Sonia Ben Ouagrham-Gormley, Alexander Melikishvili, and Raymond A. Zilinskas, 2006. "What Non-proliferation Policy for the Soviet Anti-plague System?" *Critical Reviews in Microbiology* 32(1):65-67.
[3] Sonia Ben Ouagrham-Gormley, Alexander Melikishvili, and Raymond A. Zilinskas, 2006, "The Soviet Anti-plague system"; http://cns.miis.edu/research/antiplague/index.htm.
[4] Center for Nonproliferation Studies, 2003. *Anti-Plague Service of Armenia* (in Russian). Monterey: Center for Nonproliferation Studies.
[5] From interviews with Armenian AP officials during the CNS staff tour of Armenian AP facilities during March 17-22, 2004.
[6] Epidemiological teams dispatched by the CPEDI and field AP stations use the seasonal AP laboratories to monitor natural foci of especially dangerous infectious diseases during seasons of high epizootic activity.
[7] From interviews with Armenian AP officials..., op. cit.
[8] The dram is the unit of currency in Armenia. Its accepted abbreviation is AMD.
[9] The difference in U.S. dollar equivalents can be explained by the fluctuations in the annual average currency exchange rates in Armenia, which is also typical for the transition economies of the NIS in general. Thus, the basis for calculating the U.S. dollar equivalents are the following annual average currency exchange rates: 1995, $1=405.8 AMD; 2000, $1=539.5 AMD; and 2002, $1=573.3 AMD.
[10] Under the Soviet system, diseases were grouped according to the degree of danger they represented to people. Thus, group I diseases were the most dangerous and group IV the least. This categorization is the opposite of the biosafety level system used in the United States and most western countries where biosafety level 1 (BL-1) microorganisms are the least dangerous while BL-4 microorganisms the most dangerous. We use the Soviet designations in this report.
[11] Center for Nonproliferation Studies, 2003. *Anti-Plague Service of Armenia*, op. cit.
[12] With this purpose the CPEDI AP specialists regularly conduct educational outreach activities, including seminars, workshops and proficiency tests, at the hospitals, clinics and other public health institutions in Armenia.
[13] Ibid.
[14] Ibid.
[15] Center for Nonproliferation Studies, 2003. *Anti-Plague Service of Armenia*, op. cit.
[16] Ibid.
[17] From interviews with Armenian AP officials..., op. cit.
[18] The territory of Armenia is divided into eleven provinces (in Armenian – *marz* or plural – *marzer*). Prior to the dissolution of the Soviet Union, the territorial-administrative division of the territory of Armenia was different as it was divided into 37 districts.
[19] Center for Nonproliferation Studies, 2003. *Anti-Plague Service of Armenia*, op. cit.
[20] Ibid.
[21] Ibid.

[22] Ibid.
[23] Ibid.
[24] Ibid.
[25] From interviews with Armenian AP officials..., op. cit.
[26] "Gadrutu ugrozhaet chuma" (Plague threatens Gadrut), A1Plus News Agency (Armenia), October 20, 2005; http://www.a1plus.am/ru/?page=issue&id=32680.
[27] Ibid.
[28] "V Armenii uchastilis sluchai ranee ne vstrechavshikhsya infektsiy" (There is an increase in the cases of previously not recorded infectious diseases in Armenia), Independent News Agency ArmInfo (Armenia), December 2, 2006; http://www.armenia-online.ru/armnews/4606.html.
[29] The Coordinating Council on Problems of Sanitary Defense of Territories of the Commonwealth of Independent States Member-States from Importation and Proliferation of Especially Dangerous Infectious Diseases (Coordinating Council in short) was created by the resolution of the Council on Cooperation in the Field of Public Health of the Commonwealth of Independent States Member-States at the meeting in Dushanbe, Tajikistan on November 22, 2000. The Coordinating Council was established for implementing intergovernmental cooperation and fostering interaction in the area of sanitary defense of the territory and protection of epidemiological well-being of the population. The Coordinating Council is comprised of fifteen representatives from twelve CIS member-states. The activities of the Coordinating Council are geared towards achievement of the following objectives: (1) creation of an interstate system of information exchange on questions of fighting especially dangerous infectious diseases as well as the importation and distribution of shipments and commodities, which are potentially hazardous from the sanitary point of view; (2) harmonization and unification of legal and methodological bases for sanitary defense of territories of CIS member-states; (3) interaction in the area of epidemiological monitoring and control over epidemiological emergencies; (4) unification of contemporary diagnostic technologies and methods of laboratory analysis; (5) development of unified methodology of sanitary defense of territories and sanitary-epidemiological monitoring of the transportation system; (6) organization of cooperation in the field of training specialists in especially dangerous infections; and (7) interaction on questions related to the manufacturing of medical immuno-biological preparations for diagnostics and prophylaxis of especially dangerous infectious diseases.
[30] "Arkhiv – Obobshchennaya Informatsiya za 2004 god" (Archive – Aggregate information for year 2004), Coordinating Council on Problems of Sanitary Defense of Territories of Commonwealth of Independent States Member-States, Council on Cooperation in the Field of Public Health of the Commonwealth of Independent States Member-States; Federal State Institution of Public Health Russian Scientific-Research Anti-plague Institute "Mikrob"; http://www.microbe.ru/pages/index.asp?id=99.
[31] Ibid.
[32] From interviews with Armenian AP officials..., op. cit.
[33] Ibid.
[34] Ibid.
[35] Ibid. The prominent Soviet immunologist, virologist, and microbiologist L.A. Zilber, who had coordinated the emergency anti-epidemiological measures during the Gadrut plague outbreak, provided detailed account of events in his memoirs. According to Dr. Zilber, the etiology of the plague outbreak in Gadrut and surrounding settlements was nature, but its spread, according to local superstitions, was enhanced by ritualized cannibalism of dead bodies infected with plague. See: L.A. Zilber, "Opetatsiya "Ruda" (Operation "Ore"), *Nauka i Zhizn*, No.12, 1966.
[36] Center for Nonproliferation Studies, 2003. *Preliminary Report on the Anti-plague System of Central Asia, the Caucasus, and Kazakhstan* (in Russian). Monterey: Center for Nonproliferation Studies.

[37] From the interviews with the Azerbaijani anti-plague officials during the CNS staff tour of the Azerbaijani anti-plague facilities on March 23-28, 2004.
[38] Center for Nonproliferation Studies, 2003. *Preliminary Report on the Anti-plague System of Central Asia*…, op. cit.
[39] Ibid.
[40] From interviews with Azerbaijani..., op. cit.
[41] Ibid.
[42] Ibid.
[43] Ibid.
[44] Ibid.
[45] Ibid.
[46] The task of a zoological team mainly consists of setting up traps and capturing hosts and vectors, which are then brought either to a seasonal AP laboratory of a field AP station, where AP specialists, when possible, proceed with isolating *Y. pestis* or other pathogens. On the other hand, the main responsibility of an epidemiological team is to investigate outbreaks of especially dangerous infectious diseases, which implies that the team members can carry out: (1) examination of both animal samples and infected people, (2) isolation of pathogens when possible, (3) quarantine of affected areas, and (4) outreach to educate local population about public health dangers posed by particular diseases.
[47] From interviews with Azerbaijani..., op. cit.
[48] Ibid.
[49] "Na uchastke nefteprovoda Baku-Dzheykhan obnaruzheny ochagi rasprostranenya chumy" (Plague foci discovered along the section of the Baku-Ceyhan oil pipeline), Regnum News Agency, November 26, 2005; www.regnum.ru/news/550666.html.
[50] F.U. Mamedzade, "Situatsia po obespechenyu biobezopasnosti v Azerbaidzhane" (Situation with regard to maintaining biosecurity in Azerbaijan). From the compilation of materials of the First Seminar on Biosecurity and Nonproliferation of Biological Weapons, Almaty, Kazakhstan, May 12-16, 2003. The seminar was organized by the Center for Nonproliferation Studies of the Monterey Institute of International Studies in collaboration with the A. M. Aikimbayev Kazakh Center for Quarantine and Zoonotic Diseases (KSCQZD) and the financial support from the Nuclear Threat Initiative.
[51] From the interviews with Azerbaijani..., op. cit.
[52] "Nunn-Lugar Transports Dangerous Germs to U.S." *Nunn-Lugar Report*, August 2005, pp.1-3; http://lugar.senate.gov/reports/Nunn-Lugar_Report_2005.pdf.
[53] Jeff Zeleny, "Bacteria transferred in fight against bioterror," *Baltimore Sun*, September 4, 2005.
[54] "Nunn-Lugar Transports Dangerous Germs to U.S." op. cit.
[55] Commenting on the agreement Senator Lugar noted: "This is an important cooperation between our two governments to counter the threat of bio-terrorism and to prevent the proliferation of biological weapons, technology, materials and expertise. This is also an important step in assisting both countries to rapidly detect, diagnose and respond to infectious disease outbreaks, whether naturally occurring or as a result of bio-terrorism." "Nunn-Lugar Transports Dangerous Germs to U.S." op. cit.
[56] From interviews with Azerbaijani..., op. cit.
[57] Center for Nonproliferation Studies, 2003. *Several Aspects of the Biological Protection System in the Republic of Belarus* (in Russian). Monterey: Center for Nonproliferation Studies.
[58] Melikishvili, op. cit.
[59] Center for Nonproliferation Studies, 2003. *Several Aspects of the Biological Protection System in the Republic of Belarus*, op. cit.
[60] World Health Organization, Regional Office for Europe, *Health Care Systems in Transition: Belarus* (draft), Copenhagen, 1997; http://www.euro.who.int/document/e72448.pdf.

[61] Belarus, "Law of the Republic of Belarus of 18 June 1993 on Public Health (*Vedomosti Verkhovnogo Soveta Respubliki Belarus*, No. 24, 18 June 1993, Entry 290, as summarized in *International Digest of Health Legislation*, Vol. 46, No. 3, 1995, pp. 297-299; http://annualreview.law.harvard.edu/population/aids/BELARUS.htm.
[62] World Health Organization, Regional Office for Europe, op. cit.
[63] Belarus Ministry of Health homepage: http://minzdrav.by/.
[64] "Sanitary-Epidemiological System in the Republic of Belarus: History, Current Issues, and Prospects" (in Russian), op. cit.; Feldman, et al., op. cit.
[65] World Health Organization, Regional Office for Europe, op. cit.
[66] V.P. Filonov, "Stages in the Development of Public Prophylaxis. Status and Principal Ways of Improving the Sanitary-Epidemiological Well-Being of the People of the Republic of Belarus" (in Russian), in: *Materials of the 9th Congress of Preventive Medicine Workers of the Republic of Belarus*, Vol. 1, (Minsk, 1996), pp. 3–22; *Public Health in the Republic of Belarus. Official Statistical Handbook for 2002* (in Russian), (Minsk, GU RNMB, 2003).
[67] Yu.A. Grachev, "Significance of High-Risk Infections in the General Pathology of the Republic" (in Russian), in: *Principles of and Prospects for Diagnosis of New and Re-emerging Infections* (in Russian), (Smolevichi, 1997), pp. 46–56.
[68] Grachev, op. cit.; *Public Health in the Republic of Belarus. Official Statistical Handbook for 2002*, op. cit.
[69] Grachev, op. cit.
[70] Ibid.
[71] V.V. Maksimovich, "Urgent Issues of Infectious Pathology of Animals in the Republic of Belarus" (in Russian), in: *Urgent Issues of Farm Animal Pathology. Materials of the International Scientific-Practical Conference* (in Russian), (Minsk, 2000), pp. 40–42.
[72] Anthroponotic viral diseases refer to those of which humans are the reservoirs for the causative virus.
[73] "Biennial Collaborative Agreement between the Ministry of Health of Belarus and the Regional Office for Europe of the World Health Organization, 2006-2007," Copenhagen, 2005; http://www.euro.who.int/document/bca/blr06a.pdf.
[74] L.P. Titov, Bioterrorism and Issues of National Security" (in Russian), in: *Terrorism as a Threat to the National Security of the Republic of Belarus: Materials of the Interagency Scientific-Practical Conference, 25 February 2002* (in Russian), (Minsk, Institut natsionalnoy bezopasnosti Respubliki Belarus, 2002), pp. 69–71.
[75] World Health Organization, Regional Office for Europe, *Highlights on Health in Belarus 2005*, Copenhagen 2006; http://www.euro.who.int/document/e88389.pdf.
[76] World Health Organization, Regional Office for Europe, op. cit.
[77] Raymond A. Zilinskas, 2006, op. cit.
[78] Natallia Paklonskaya, "Improvement of the biosecurity system in the Republic of Belarus: Approaches to the establishment of controls over dual-use research," paper presented at the Center for Nonproliferation Studies, December 13, 2006.
[79] Center for Nonproliferation Studies, 2003. *Formation and Activity of Anti-Plague System of Georgia* (in Russian). Monterey: Center for Nonproliferation Studies.
[80] Ibid.
[81] Ibid.
[82] Ibid.
[83] According to the Article 1509 of the Civil Code of Georgia, the legal subjects of the public law include the following: a.) the state; b.) the self-governments; c.) the legal subjects established by the state on the basis of specific legal acts, other than the organizational types defined in the Civil Code and the Law on Entrepreneurs; d.) the state organizations or state foundations not established in compliance with the Civil Code or the Law on Entrepreneurs; e.) the non-

governmental organizations established under specific legal acts in order to pursue objectives of public interest (political parties, religious associations, etc.). The NCDCMS falls into the c.) category.

[84] From interviews with Georgian AP officials during a CNS staff tour of the Georgian AP facilities, May 20-23, 2003.

[85] From interviews with Georgian AP officials..., op. cit. Also based on the information posted on the official website of the L. Sakvarelidze National Center for Disease Control and Medical Statistics; http://www.ncdc.ge/.

[86] From interviews with Georgian AP officials..., op. cit.

[87] Center for Nonproliferation Studies, 2003. *Formation and Activity of Anti-Plague System of Georgia*, op. cit.

[88] Ibid.

[89] Ibid.

[90] Ibid.

[91] Ibid.

[92] From interviews with Georgian AP officials..., op. cit.

[93] Center for Nonproliferation Studies, 2003. *Formation and Activity of Anti-Plague System of Georgia*, opacity.

[94] From interviews with Georgian AP officials..., op. cit.

[95] Center for Nonproliferation Studies, 2003. *Formation and Activity of Anti-Plague System of Georgia*, op. cit.

[96] Ibid.

[97] Ibid.

[98] Ibid.

[99] Ibid.

[100] From a presentation by Katie Zaridze, Information Manager and Aide to the Director of the NCDCMS, The English Language and Nonproliferation Program (ELAN), Center for Nonproliferation Studies, Monterey Institute of International Studies, Monterey, California, March 7, 2007.

[101] Embassy of the United States in Georgia, "U.S. Senator Richard Lugar Tours National Center for Disease Control," Press Release, August 22, 2006; http://georgia.usembassy.gov/releases/2006/release20060822LugarNCDC.htm.

[102] "US helps build biosecurity laboratory in Georgia," ITAR-TASS News Agency, March 31, 2007.

[103] "US to fund new virus laboratories in Georgia – Lugar," Interfax News Agency, August 23, 2006; and "US helps build biosecurity laboratory in Georgia," ITAR-TASS News Agency, March 31, 2007.

[104] From interviews with Georgian AP officials… op. cit. With regard to the theft of the laboratory equipment in Kutaisi in December 2005, Robert Orttung and Louise Shelley cited this incident without providing more detailed information on what happened afterwards. See: Robert Orttung and Louise Shelley, "Linkages between Terrorist and Organized Crime Groups in Nuclear Smuggling: A Case Study of Chelyabinsk Oblast," Program on New Approaches to Russian Security (PONARS) Policy Memo No.392, December 10, 2005; http://www.csis.org/media/csis/pubs/pm_0392.pdf.

[105] CNS e-mail and phone communication with the NCDCMS administration representative, December 14-16, 2005.

[106] Raymond A. Zilinskas, 2006, op. cit.

[107] Pamela Hess, "Spy Officials Tracking Key Scientists," Associated Press, September 26, 2007.

[108] Almaty was called Alma-Ata in Soviet times but in this report we will use its current name throughout (except when in quotes).

[109] Decree of the RSFSR People's Commissariat of Public Health (Narkomzdrav) No. 1, on the Alma Ata Anti-plague Station, September 15, 1934 (in Russian).
[110] USSR Ministry of Health, Decree No. 739, On Reorganizing and Renaming the Alma Ata Anti-plague Station to the Central Asian Anti-plague Research Institute, December 9, 1948 (in Russian).
[111] The Soviet Ministry of Health's Second Directorate was responsible for supervising the Soviet AP system.
[112] The Soviet Ministry of Health's Third Directorate was in charge of space biology and health clinics in closed cities; it also undertook the program "Flute" as part of the Soviet BW effort, and had responsibilities for Problem 4 (responding to cholera outbreaks) and Problem 5. The Directorate was also responsible for the medical aspects of the clean-up of Chernobyl's aftermath.
[113] Raymond A. Zilinskas, 2006, op. cit.
[114] Ministry of Public Health of Kazakhstan, Decree No. 45, On Renaming the Central Asian Anti-plague Research Institute to the Kazakh Anti-plague Research Institute, January 28, 1992 (in Russian).
[115] Government of the Republic of Kazakhstan, Decree No. 582, On Renaming the Kazakh Anti-plague Research Institute of the Republic of Kazakhstan to the M. Aikimbaev Kazakh Science Center for Quarantine and Zoonotic Diseases, May 2, 2001 (in Russian).
[116] Interview with the Director of the Mangghystau AP station, October 15, 2002.
[117] Interview with the Director of the Shymkent AP station, January 15, 2003.
[118] Interview with the Director of the Mangghystau AP station, op. cit.
[119] "The Monthly average salary rose by 13.9 percent," (in Russian); http://www.stat.kz/index.php?lang=rus&uin=1171355968.
[120] "Small Business Sector Shows Strong Growth, A Sign of Growing Prosperity and Self-Reliance," December 22, 2004; http://www.kazakhembus.com/122204.html.
[121] Interview with the Director of the Mangghystau AP station, op. cit.
[122] Ibid.
[123] Ibid.
[124] Interview with the Director of the Shymkent AP station, op. cit.
[125] The word "phage" is short for "bacteriophages." A phage is specialized virus that destroys bacteria by lysis, which is a process of disintegration. However, phages are highly specific; i.e., a phage will only lyse a specific bacterial species and no other. By using this property, a microbiology laboratory can build up a library of phages and use them to relatively quickly identify bacterial species, in this case *Yersinia pseudotuberculosis*, without having to resort to the much lengthier culture procedure.
[126] Interview with the Director of the Shymkent AP station, op. cit.
[127] In 2002, KSCQZD was designated a repository for high-risk infectious pathogens and has the responsibility for operating the republic's collection of highly dangerous pathogens (Government of the Republic of Kazakhstan, Decree No. 850, On National Collections of Microorganisms, July 30, 2002 [in Russian]).
[128] Center for Nonproliferation Studies, 2003. *Preliminary Report on the Anti-plague System of Central Asia*…, op. cit.
[129] Ibid.
[130] Ibid.
[131] Ibid.
[132] Ibid.
[133] Ibid.
[134] Ibid.
[135] Ibid.
[136] Interview with the Deputy Director of the Atyrau AP station, August 11-12, 2003.

[137] Interview with the Director of the Jambul AP station, January 13-16, 2003.
[138] Center for Nonproliferation Studies, 2003. *Preliminary Report on the Anti-plague System of Central Asia*…, op. cit.
[139] From interviews with Kyrgyz AP officials during a CNS staff tour of Kyrgyz AP facilities, May 8-10, 2003.
[140] Center for Nonproliferation Studies, 2003. *Preliminary Report on the Anti-plague System of Central Asia*…, op. cit.
[141] After Kyrgyzstan achieved independence in late 1991, the indigenous names of many cities, cities, villages, and settlements were restored. Thus, Frunze was changed to Bishkek and Przhevalsk to Karakol.
[142] Interviews with Kyrgyz AP officials..., op. cit.
[143] Ibid.
[144] "Anthrax on the rise in South [Kyrgyzstan]," Integrated Regional Information Networks (IRIN) News [the humanitarian news and analysis system of the United Nations Office for the Coordination of Humanitarian Affairs], October 26, 2005; http://www.irinnews.org/.
[145] From interviews with Kyrgyz AP officials..., op. cit.
[146] Ibid.
[147] Ibid.
[148]The information stated here about the Moldova AP system was collected in course of interviews of Moldovan scientists, who shall remain anonymous, by Raymond A. Zilinskas during May 2003.
[149] In May 2003, the exchange rate was $ 1 = 14.1 lei.
[150] Soviet era laboratories were subdivided into specialty sub-laboratories that were called "boxes." Thus a bacteriology laboratory could have a cholera box, an anthrax box, and so on. This system still exists in most NIS.
[151] In Soviet times this institute was named Scientific Research Institute of Poliomyelitis and Viral Encephalitis.
[152] World Bank, *Moldova Health Policy Note: The Health Sector in Transition*, Report No. 26676-MD, Washington, D.C. November 2003.
[153] World Health Organization, Regional Office for Europe, *Healthcare Systems in Transition: Republic of Moldova 2002*, Copenhagen 2002; http://www.euro.who.int/document/e81265.pdf.
[154] Ibid.
[155] World Health Organization, Regional Office for Europe, *Highlights on Health in the Republic of Moldova 2005*, Copenhagen 2006; http://www.euro.who.int/Document/e88552.pdf.
[156] World Health Organization, Regional Office for Europe, *Republic of Moldova: 10 Health Questions*, Copenhagen 2006; http://www.euro.who.int/document/e88202_moldova.pdf.
[157] Science and Technology Center in Ukraine, "Board 23, November 16, 2006: Joint Statement"; http://www.stcu.int/documents/stcu_inf/gbm/gbm23/.
[158] See endnote 148.
[159] Center for Nonproliferation Studies, 2003. *Preliminary Report on the Anti-plague System of Central Asia*…, op. cit.
[160] From interviews with Tajik AP officials during the CNS staff tour of Tajik AP facilities, May 5-6, 2003.
[161] Ibid.
[162] Ibid.
[163] Ibid.
[164] Ibid.
[165] Ibid.
[166] Odessa City Duma Resolution, dated May 21, 1886, in Ukraine Ministry of Health, *I.I. Mechnikov Anti-plague Scientific and Research Institute of Ukraine* (in Ukrainian), Odessa, 2003.

[167] Ukraine Cabinet of Ministers Resolution #1201, dated July 7, 1999, and Ukraine Ministry of Health Order #180, dated July 23, 1999.
[168] These stairs were made famous due to having been the set for one of the most stirring scenes in the classic 1925 film "Battleship Potemkin" directed by Sergei M. Eisenstein.
[169] See the official website of the I.I. Mechnikov Scientific Research Anti-plague Institute of Ukraine; http://ukrantiplague.narod.ru/ (accessed 3/9/06). (This site, written only in Russian, is hopelessly outdated, having been last updated in 2001.)
[170] The information that follows on the institute's physical facilities is abstracted from the following three sources: observations by the author, interviews with institute administrators and scientists, and the brochure *I.I. Mechnikov Anti-plague Scientific and Research Institute of Ukraine* (in Ukrainian) by Ukraine Ministry of Health, Odessa, 2003.
[171] In 1991, the Ukrainian MOH decided that all cultures of Group I pathogens held in Ukraine were to be transported to the Mechnikov AP Institute. This was done according to well developed biosafety/biosecurity procedures in place from the Soviet era for packing and transporting pathogens. It appears as if these pathogens were then either destroyed or transferred to the Soviet Union before it dissolved in December 1991.
[172] The current culture collection situation in Ukraine is complex. The government has designated the L.V. Gromashevskogo Institute of Epidemiology and Infectious Diseases of the Academy of Medical Sciences in Kiev as its main depository of human pathogens. However, this institute has depository branches throughout Ukraine as follows: Kharkiv Institute of Microbiology and Immunology of the Academy of Medical Sciences has collections of bacteria, fungi, and viruses; the I.I. Mechnikov Anti-plague Scientific and Research Institute of Ukraine has especially dangerous bacteria and viruses; the Lviv Scientific and Research Institute of Epidemiology and Hygiene of the Ministry of Health has viruses and rickettsia; the Ukrainian Scientific and Research Institute of Venerology has chlamydia; and the Kiev Medical University has viruses. The source of this information is: Meeting of the State Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, "Procedure to Control Access and Work with Biological Agents and Toxins in Ukraine – Prepared by Ukraine," First Meeting, Geneva, 10-14 November 2003, document BWC/MSP.w003/MX/WP.42, August 22, 2003.
[173] No staff member of the CNS has had the opportunity to visit the Crimean AP Station. All information provided here originated from: A.B. Khaytovich and V.A. Shikulov, "Short Essay about the Krem Anti-plague Station" (in Russian), in Yu.G. Suchkov and N.N. Basova (eds.), *Interesting Stories About the Activities and People of the Anti-Plague System of Russia and the Soviet Union* (in Russian), no. 12, part 2, (Moscow: AOZT Informika, 2003), pp. 153–156.
[174] Interview with Ukrainian anti-plague scientist, May 2004.
[175] Meeting of the State Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, "Provisional List of Participants. A. States Parties," Second Meeting, Geneva, 6-10 December 2004, Meeting of Experts, Geneva, 19-30 July 2004.
[176] Ivan Rusev, "The Plague: One Hundred Years Later" (in Russian). *Slovo* (The Word – an Odessa weekly Internet newspaper), No. 50 (317), December 18, 1998.
[177] Valeria Lekhan, Volodomyr Rudiy, and Ellen Nolte, *Health Care Systems in Transition: Ukraine*, (Copenhagen: WHO Regional Office for Europe, 2004).
[178] Ibid.
[179] Interviews with scientists and administrators at the Central Sanitary-Epidemic Station of the Ukrainian Ministry of Health in Kiev, May 2004.
[180] L.V. Parkhomenko, V.V. Alexeenko, and E.V. Murashko, "Waterborne epidemic infections in Ukraine at last decade," in Centers for Disease Control and Prevention (ed.) *Proceedings of the*

International Conference on Emerging Infectious Diseases, 2002; http://www.cdc.gov/ideid/asm-ideid_program.pfd.

[181] This system is described in detail in the report: Meeting of the State Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, "National System of Epidemiological Surveillance in Ukraine – Submitted by Ukraine," Second Meeting, Geneva, 6-10 December 2004, Meeting of Experts, Geneva, 19-30 July 2004, document BWC/MSP/2004/MX/WP.47, July 22, 2004.

[182] Interview with Ukrainian anti-plague scientist, May 2004.

[183] Meeting of the State Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, "Procedure to Control Access and Work with Biological Agents and Toxins in Ukraine – Prepared by Ukraine," First Meeting, Geneva, 10-14 November 2003, document BWC/MSP.w003/MX/WP.42, August 22, 2003.

[184] United States Department of Defense, *DOD Global Emerging Infections System: Partnering in the Fight Against Emerging Infections, Annual Report Fiscal Year 2005*, Washington, D.C. 2005; http://www.geis.fhp.osd.mil/GEIS/DoDGEISNews/GEIS_AR_05.pdf.

[185] United States Embassy in Ukraine, "New Nunn-Lugar Biological Agreement Signed in Ukraine," August 29, 2005; http://kiev.usembassy.gov/press/050829_lugar_eng.html.

[186] The Lviv institute had an important role in the Soviet BW program and currently many of its responsibilities in the north-west part of Ukraine resemble that of a typical Soviet-era AP institute.

[187] See endnote #112.

[188] See endnote #113.

[189] Presidential Decree *On the State Program to Reform the Public Health System of Uzbekistan* of 1999 (in Russian).

[190] CNS interview with the director of the Center for Prophylaxis of Quarantine and High-Risk Infections (CPQHRI), Washington, D.C., March 28, 2002.

[191] CNS interviews at Zarafshan, Karakalpak, and Turtkul AP stations, September 8-17, 2003.

[192] Ibid.

[193] Center for Nonproliferation Studies, 2003. *The Evolution of the Anti-plague system of Uzbekistan and Its Objectives* (in Russian). Monterey: Center for Nonproliferation Studies.

[194] CNS interview with the head of Turtkul field AP station, Autonomous Republic of Karakalpakstan, Uzbekistan, September 9, 2003.

[195] Center for Nonproliferation Studies, 2003. *The Evolution of the Anti-plague system of Uzbekistan and Its Objectives*, op. cit.

[196] N. Dyagterev, *Aktualnie voprosy epidnadzora v prirodnykh ochagakh chummy. Prirodnaya ochagovost' v vysokogoryakh* (Contemporary problems of epidemiological monitoring of the natural plague foci. The formation of natural plague foci in the mountainous regions), Stavropol, 1985.

[197] Center for Nonproliferation Studies, 2003. *The Evolution of the Anti-plague system of Uzbekistan and Its Objectives*, op. cit.

[198] CNS interview with the head of the Zarafshan field AP station, Zarafshan, Uzbekistan, September 8, 2003.

[199] Center for Nonproliferation Studies, 2003. *The Evolution of the Anti-plague system of Uzbekistan and Its Objectives*, op. cit.

[200] CNS staff visit to the Center for Prophylaxis of Quarantine and High-Risk Infections (CPQHRI), September 2003.

[201] CNS interview with the head of the Zarafshan field AP station, op. cit.