Scott Carroll and Tania Collas

Figure 1: Safety equipment for the field laboratory.
Rustem 1: Arazi laboratuvarı için güvenlik malzemeleri.
Credit: Glenn Wharton

Spring 1999
Laboratory Safety Supplies

The purpose of laboratory safety equipment is to limit the exposure of workers to hazardous chemical substances in the workplace. As discussed by Kent Severson in Field Note Number 3, Conservation and Related Materials: Suppliers and Shopping in Turkey, most common laboratory solvents and chemicals are available in Turkey. These supplies include chemical splash goggles, dust masks, respirators with solvent vapor and acid gas cartridges, and latex and nitrile gloves. Conservators who use hazardous chemicals—including solvents such as ethanol and acetone, adhesive-solvent solutions, and acids—should have a first-aid kit on hand at all times. An ARC-grade fire extinguisher, available in hardware stores throughout Turkey, is essential for all laboratories that use any kind of solvents. When selecting a fire extinguisher, make sure it is effective on flammable liquid and grease fires; ideally, it should also be appropriate for trash and electrical fires.

General Laboratory Safety Tips

Conservators should always exercise proper safety precautions, whether they are using hazardous chemicals in a treatment or only mechanically cleaning and rendering artifacts. Suggested safety practices include the following:

- Never place, store, or consume food and drink in the conservation workspace.
- Never smoke in the conservation workspace if solvents are present.
- Wear a dust mask anytime a cleaning treatment generates dust. This is especially important when cleaning artifacts with a glass bristle brush to prevent inhalation of the small glass fibers produced by the brushing action.
- Clearly label all bottles and containers of solvents, adhesives, and other chemicals with their contents and any specific hazards, such as "toxic," "flammable," or "irritant."

Before going into the field, conservators should learn basic first aid and emergency procedures appropriate for the types of treatments and materials they intend to use so that they are prepared in case of an accident. In the U.S., the most direct means of accessing medical information is the Material Safety Data Sheet (MSDS) for the particular product. Material Safety Data Sheets list contents, physical properties, flammability and explosion data, safety handling precautions, recommended storage and disposal, health effects and toxicity data, emergency procedures

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Safety Measures for Solvents and Acids

Solvents evaporate at a much faster rate in the hot summer temperatures often encountered in Turkey than they do at standard laboratory temperature. Therefore, conservators and archaeologists performing treatments that involve solvents should wear respirators fitted with solvent vapor cartridges more frequently in the field than they do in the laboratory. For the conservator to function effectively, it must be used with fresh cartridges and filters and must, or course, fit the wearer properly. Even solvents with relatively low toxicity, such as ethanol and acetone, may produce harmful vapor levels in high heat conditions due to their high volatility. Many conservators who work outdoors to minimize their exposure to solvent vapors do not realize that they are inhaling a large volume of fumes until they begin to feel the effects. Some common symptoms of solvent exposure include dizziness, light-headedness, headaches, nausea, disorientation, as well as eye, nose, and throat irritation. The fast pace of field conservation work should not preclude common-sense safety measures. For example, fans used for solvent vapor dispersion or extraction should be positioned so that the vapors are drawn away from rather than past the conservator.

Conservators should also take safety precautions during chemical cleaning treatments. Wear chemical splash goggles, protective gloves, and closed-toed shoes around open containers of acid solutions. When mixing acid solutions, remember to pour acid into water—never pour water into concentrated acid!

Disposal of Hazardous Solvents, Acids, Bases, and Other Conservation Materials

The remote location of many archaeological excavations may provide an advantage with regard to the safe disposal of solvent waste. Since most field conservators do not use large amounts of solvents for their treatments, they do not always need to apply industrial standards for solvent disposal in the field. Under safe conditions, small amounts of waste solvents may be left to evaporate outdoors in protected areas inaccessible to children and animals. Note that any chlorinated solvent waste should be evaporated separately from non-chlorinated solvent waste.

Acid solutions should be diluted well to prepare them for disposal; they can then be poured on the ground in a remote area, away from people and water sources. Flushing the disposal area with additional buckets of water or priming the ground with lime powder (calcium carbonate) can help neutralize the acid solution upon disposal. If conservators use bases, such as ammonia, in a treatment, they should always remember to use, store, and dispose of them separately from acids.


Çözücülerle Karşılaştırılabilir Güvenlik Önlemleri


Konservatörler kıyaslal temizlik işlemleri sırasında gerekli güvenlik önlemlerinin alınmasına dikkat etmelidirler. Asit içeren açık kapların yakınında çalışırken kıyaslal maddelerden koruyucu çözüller, edilvenler ve kapalı ayakabılar giymelmesi gerekir. Asit karşılamaları hazırlarken asiden suya eklenecek, konsantre haldaki asit üzerine hiçbir zaman su dökülmemeyecek gibi unutmayın!

Zararlı Çözücülerin, Asitlerin, Bazların ve Diğer Konservasyon Malzemelerinin Yöke
dilmesi

Pek çok arkeolojik kuzum için konu, çözücü atıklarının yöke
dilmesi konusunda bir avantaj olarak kabul edilir. Aslında çalışan çoğu konservator uygulamalarında büyük miktarlarda çözücü kullanmakmaktadır ve çözücü atıkları ile ilgili endüstriyel standartları her zaman uygulamak zorunda değildirler. Gerekli güvenlik önlemleri alındığında sonra, belir
delen alanlarda kullanımaki çözücü atıkların buharlaşması
The safe disposal of hazardous waste, including used scalpel blades and broken glass, is ultimately the responsibility of the user. There are no perfect solutions to hazardous waste disposal. Conservators should consider that other people may handle materials thrown in the trash; dangerous items should be well sealed and labeled with a skull-and-crossbones symbol.

Storage Recommendations for Solvents, Acids and Bases

Conservators must also be responsible for the safe storage of any unused solvents, acids, or bases remaining at the end of the field season. In general, corrosive liquids, such as acids and bases, should be stored separately from flammable liquids, such as solvents, to avoid the fire hazard posed by the exothermic reaction that could occur during a spill. Acids and bases should also be segregated in storage for the same reason. Any boxes used for storing solvents, acids, or bases should be labeled on the outside with a general description of the contents and their potential hazards, for example: CAUTION—SOLVENTS—FLAMMABLE or CAUTION—ACID—CORROSIVE.

Conclusion

In summary, a little planning in advance and a few simple precautions can greatly increase the level of safety in the field laboratory. However, this should not be the work of just one individual; all excavation staff members need to be safety-minded in order to prevent accidents and eliminate hazards on site.

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Tania Collas is the conservator at Donuztepe excavations in the Kahramanmaras province. Outside of the summer excavation season, she works as an objects conservator in private practice.

Field Notes is a series of essays written by professional conservators and archaeologists. They are intended for archaeologists, conservators and students as resource guides for the stabilization and preservation of excavated materials and archaeological sites.

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For additional copies of Field Notes, or more information about the series, please contact: Japanese Institute of Anatolian Archaeology Rest Galip Cad. 63/5, Gaziosmanpaşa, Ankara, TURKEY, Tel: 90-312-437-7007, FAX: 90-312-446-6838.

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Aşıl olarak dezenfektı katı, önceden yapılacak küçük bir planlama ve ternel önlemlerinin alınması kazi laboratuvarının güvenliğini artıracaktır. Buna karşın, güvenli bir konuda sadece konservatörün sorumluluğu olmamalıdır; tüm kazi ekibine araziye olabilecek kazaları ve karşılaşılabilecek tehlikeleri önleme için güvenliye önem vermelidirler.

Sonuç

Sonuç olarak, dezenfektı kazi, önceden yapılacak küçük bir planlama ve ternel önlemlerinin alınması kazi laboratuvarının güvenliğini artıracaktır. Buna karşın, güvenli bir konuda sadece konservatörün sorumluluğu olmamalıdır; tüm kazi ekibine araziye olabilecek kazaları ve karşılaşılabilecek tehlikeleri önleme için güvenliye önem vermelidirler.

Tania Collas. Yaz döneminde Kahramanmaraş’ın sınırlarında içindeki Donuztepe Kazı’sında, kazi dönemi sırasında ise küçük objeler üzerinde özel konservatör olarak çalışmaktaydı.